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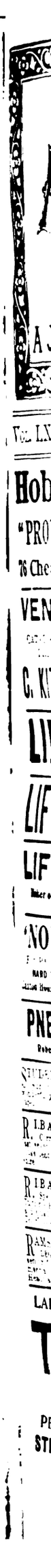
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THE

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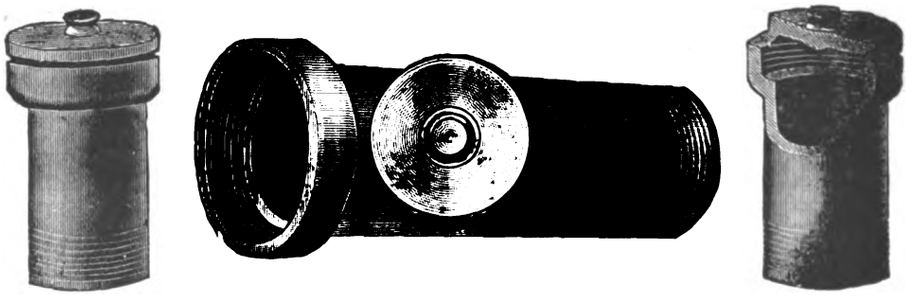
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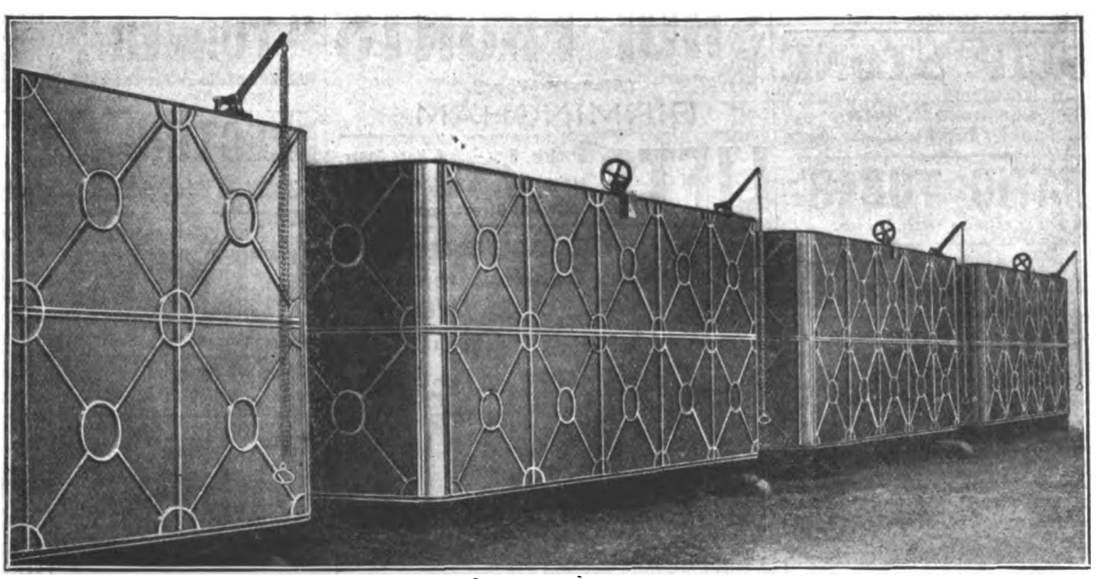
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A WEEKLY

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FORTHCOMING EVENTS.

Saturday, July 3.

Edinburgh Architectural Association, annual excursion. Dunblane and Doune.

Tuesday, July 6.

Architectural Association of Ireland, annual excursion, July 6 to July 10. Headquarters at the Fleece Hotel, Cirencester, Gloucestershire.

Archæological and Architectural Society of Northumberland and Durham, annual meeting, July 6 and 7. Headquarters at Nithsdale.

Monday, July 12.

British Archæological Association. Sixty-sixth annual congress, July 12 to July 17. Headquarters at the Royal Hotel, Norwich.

Wednesday, July 14.

Town-Planning and Housing Exhibition. An exhibition promoted by the Hampstead Garden Suburb Trust, Ltd., the Co-partnership Tenants, Ltd., and the Garden Suburb Development Co., Ltd., will be held at Hampstead Garden Suburb from July 14 to August 7.

THE VICTORIA AND ALBERT MUSEUM.*

A PARADISE for the architectural student, indeed for any art student whose conception of art extends beyond the painting of oil pictures. Such will be the Victoria and Albert Museum when the new buildings opened by the KING and QUEEN last Saturday have been completely furnished with the many art objects that have hitherto been huddled together so that adequate study was almost impossible, or worse still, hidden away out of sight waiting for an opportunity of display.

The buildings, designed by Sir ASTON WEBB, R.A., and added to the former South Kensington Museum, enclose this latter towards Cromwell Road and Exhibition Road, and hence present to the public view an appearance more worthy, architecturally, of the premier art museum of Great Britain than the heterogeneous collection of mean buildings and sheds that formerly served but the utilitarian purpose of housing the nation's art treasures.

The principal entrance in Cromwell Road opens into an entrance hall from which right and left are staircases to the galleries, four storeys in height, which occupy the frontages to Cromwell Road and Exhibition Road. On plan these gallery buildings follow the line of the roads on which they abut, so that the principal front, that to Cromwell Road, follows a circular curve in a series of straight sections approximately tangential to the curve.

At the rear of the Cromwell Road galleries are a series of halls, lofty and top lighted, named the West Hall, the Central Hall, and the East Hall; then behind these runs a long, wide corridor, and off this a series of courts—the Octagon Court, West Court, West Central Court, Central Court, East Central Court, East Court—and then the old architectural court now to be called the Square Court. Thus the new buildings are brought up to and join the older portion of the museum.

Relying upon the principle that the proper decoration of a museum is its contents, Sir ASTON WEBB has kept his interior very simple in treatment; only in the entrance hall and its adjacent stairs has he permitted himself any departure from economical severity.

The entrance hall is treated in Portland stone with characteristic Astonian detail, and the stairs are in marble. The restricted amount of architectural features in the halls and courts is executed in plaster. Despite the severity of treatment there are many fine effects of vista, particularly in the halls and stairs, and it is in this direction rather than in elaborate detail that the skill of the designer has been shown. In the use of the detail that has been adopted Sir ASTON WEBB has created interest by a variation of theme. Thus, in the Octagon Court we have Corinthian columns of a somewhat French type, in the West Central and East Central Courts we have Doric columns, and so on.

From the preliminary guide issued by the Board of Education we learn that the new buildings have a frontage of 720 feet to Cromwell Road and 275 feet to Exhibition Road; the total length of galleries in the new building is just one mile, and the top-lighted courts have a superficial area of nearly 1½ acres. The scheme of sculptured decoration on the front includes statues of thirty-two famous British artists and craftsmen, ten painters, six sculptors, six architects, and ten craftsmen. These statues have been executed by Messrs. S. BOYES, V. HILL, R. GOULDEN, J. A. STEVENSON, LYNN JENKINS, PAUL MONTFORD, S. W. BABB, G. BAYES, A. BROADBENT, W. S. FRITH, J. GAMBLE, E. G. GILLICK, A. H. HODGE, A. B. PEGRAM, J. W. ROLLINS, R. SHEPHERD, A. G. WALKER, and O. WHEATLEY. The figure of Fame on the lantern and the two in the buttresses below, representing Architecture and Sculpture, are by Professor LANTERI, of the Royal College of Art. The statue of Queen VICTORIA, with her supporters St. MICHAEL and St. GEORGE, the statue of the PRINCE CONSORT under the arch

* See Illustrations.

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and the figures of Knowledge and Inspiration on either side of the entrance, are by Mr. ALFRED DRURY, A.R.A. The spandrils over the arch representing Truth and Beauty are by Sir GEORGE FRAMPTON, R.A., while the statues of King EDWARD VII. and Queen ALEXANDRA are by Mr. GOSCOMBE JOHN, R.A. The general architectural carving in the front was done by Mr. W. S. FRITH.

The general contractors for the foundations were Messrs. LESLIE & Co., of Kensington; and for the superstructure Messrs. HOLLIDAY & GREENWOOD, of Brixton. The following sub-contractors were engaged upon various classes of work:—Marble-work, Messrs. BURKE & Co., Messrs. FARMER & BRINDLEY, Messrs. WALTON, GOODY & CRIPPS; Mosaic, Art Pavements and Decorations, Ltd.; metal-work, Messrs. HART, SON, PEARD & Co.; ornamental plaster-work, Mr. G. P. BANKART; Mack partitions, Messrs. J. A. KING & Co.; Cranham brick partitions, Messrs. J. H. SANKEY & SON; expanded metal, Messrs. A. & J. MAIN, Ltd.; heating, Atmospheric Steam Heating Co.; glazing, Messrs. W. E. RENDLE & Co.; paint, Messrs. R. GAY & Co.; distemper, The Silicate Paint Co. and The Rapidal Paint Co.

The arrangement of the collections in the museum has been carried out on the basis of materials in which the various works of art are executed, save that architecture and sculpture, in which the museum is rich in examples, form a separate department. Under this scheme a difficulty arises in the classification of structures of wood, which might frequently be properly included under the category of architecture. To get over this difficulty the principle has been adopted of assigning to the department of Architecture any structure in wood that can be described as external, and to the department of Woodwork such structures as are internal. The term sculpture is used in its widest sense, and includes what is often and perhaps more properly described as carving. The main groups of the collections are arranged in subdivisions under the categories of (*a*) historical, by date; (*b*) local, by country of manufacture.

Architecture and Sculpture occupy a considerable proportion of the floor area of the new buildings, the West and East Halls, the galleries on the lower and upper ground floors east of the main entrance, as well as the old Architectural, now the Square, Court being devoted to this department. Thus the very remarkable series of examples of most of the important schools of the Renaissance possessed by the museum will have an opportunity of being carefully and thoroughly studied. The long corridor that divides and connects the halls from the courts is devoted to a series of drawings, prints, and photographs of an architectural character, which though at present scarcely in a sufficiently complete condition for the purpose, is intended to be developed into an architectural index.

The department of Woodwork which, as we have already explained, includes architectural detail of internal character as well as furniture, occupies galleries on the lower and upper ground floors west of the main entrance, and extending along both Cromwell Road and Exhibition Road frontages, and to this department are also allotted the floor areas of the West Central, Central, East Central, and East Courts. These courts already to some extent, and still more so when completely furnished, will have a specially charming effect, as the wall space around them is devoted to the department of textiles, which in non-technical language means in this case tapestries. The pleasure of the ordinary visitor has apparently been considered in the arrangement of these courts, which, with their tapestried walls and costly old furniture disposed on the floor, will have rather the effect of palatial show apartments than places for serious study. Indeed, the student of textiles comes off rather badly, as this department is located in a lengthy series of comparatively narrow corridors on the first floor, as well as furnishing the walls of the spectacular courts. As a compensation the new department of Engraving, Illustration, and Design exhibits original designs for silks and printed cottons of the eighteenth century.

The woodwork galleries, perhaps by reason of their being more completely arranged at present than some other parts of the new building, are to our mind the most attractive and enthusing portion of the museum, as the halls are not as yet wholly occupied and what objects are placed in them are to a certain extent only in temporary locations.

The galleries on the upper ground floor next Cromwell Road frontage contain a portion of the collection chronologically arranged to illustrate as far as possible the development of Italian sculpture from the thirteenth to the seventeenth century, and include examples of the work of the PISANI, LORENZO GHIBERTI, DONATELLO, BENEDETTO DA MAIANO, the DELLA ROBBIA family, MICHEL ANGELO, GIOVANNI DA BOLOGNA, JACOPO SANSOVINO, and other artists of the early Italian Renaissance.

The East Hall is also mainly devoted to Italian architecture, including the chapel of Santa Chiara, removed bodily in 1860 from the suppressed convent of Santa Chiara in the Borgo San Spirito at Florence, probably built by CRONACA about 1493. There are, however, included in the East Hall some Spanish, Flemish and French works of art of fifteenth and sixteenth century date, including an interesting collection of French sixteenth century architecture presented to the museum in recent years by Mr. J. H. FITZHENRY.

In the West Hall are some interesting examples of English architectural work in wood and some Flemish and German work, but this hall can hardly yet be considered arranged in its final form.

Taken altogether the new Victoria and Albert Museum, whether as a piece of architectural design or as a place for the study of architecture, is a national work of which we have just reason to be proud.

NOTES AND COMMENTS.

IN the case of the Municipal Gallery of Modern Art in Dublin, the exertions of Mr. HUGH P. LANE in the establishment of the museum have been recognised by the honour of knighthood. Though this gallery is rather more devoted to pictures than architecture, one cannot but be gratified by the honour paid to any efforts at forwarding the interests of art in whatever direction these may have been exhibited.

THE Guild of Architects' Assistants is the result rather of the development of the practice of young architects of the present day of spending their whole life as assistants rather than as attempting to make an independent position as principals. In this development it will be welcomed by principals who have hitherto found it most difficult to obtain the services of the class of assistant represented in solicitors' offices by managing clerks. It has often been said that it is easy enough to get any number of assistants who are worth thirty shillings a week, but next to impossible to obtain those who are worth to their employers five pounds a week or more. If the new guild will direct their attention to the enrolment of a superior class of managing assistants, they will find that employers will be only too ready to give berths to this class and treat them fairly and generously as permanent members of their staff.

A NEW bridge over the Thames such as the proposed "St. Paul's Bridge" is undoubtedly an urgent necessity for the traffic requirements of London. We hope also that the Bridge House Estates Committee of the City Corporation, in addition to the practical benefit of the proposed new bridge, will take care that London is to have a beautiful bridge instead of another eyesore. The ability of the Corporation funds to provide this new bridge without expense to the ratepayers is another argument, if any were needed, for the existence unimpaired of the Corporation of the City of London, and by making the new bridge a work of art the City authorities would still further justify their existence and earn the gratitude of the citizens.

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SOME time ago we warned our readers against the attempt by a person professing to require tenders under an assumed name, applications to submit such tenders to be accompanied by a substantial deposit. A Mr. ROBERT ANDERSON, described as an architect, has been committed for trial on a charge of obtaining money by false pretences, and obtaining credit by fraud for retaining deposits to the extent of nearly 200*l.* accompanying tenders for building schemes, which it was stated at the hearing before the magistrate were chimerical. It behoves, therefore, all contractors who are asked to deposit money with tenders to assure themselves of the *bona fides* of the persons inviting the tenders.

DR. EVANS has made some further interesting discoveries at Knossos in a stone sepulchral chamber with vaulted roof of apparently an early period, the "Third Middle Minoan," that is about the eighteenth century B.C. In the chamber, although previously rifled, some gold rings with engraved subjects were found. The remarkable character of the early civilisation revealed by the previous discoveries at Knossos is maintained by these latest finds.

FROM the case of ROBERTSON *v.* WILLMOTT, tried before Mr. Justice WARRINGTON, it is established that an architect is practising his profession although he may be acting as assistant to another architect, and not in independent practice. The defendant under the covenants of a deed of partnership was prohibited from practising as an architect within a radius of ten miles from Cardiff Town Hall, and as manager to another architect he, in the judgment of Mr. Justice WARRINGTON, infringed that prohibition. This is a point for the Guild of Architects' Assistants.

THE Surveyors' Institution have further elucidated the action of the present Finance Bill proposals for the taxation of land values by their supplementary report, showing how many grievous hardships will probably be inflicted upon holders of property if the proposals are carried. Those hardships must necessarily reflect on architecture, which for its opportunities is largely dependent on the ability and willingness of landholders to undertake or encourage building.

A FITTINGLY graceful touch was added to the opening ceremony of the Victoria and Albert Museum by H.M. the KING, in bestowing on the spot the honour of knighthood on Mr. CECIL SMITH, the Director of the Museum; and the part taken by Sir ASTON WEBB in bringing this national monument to completion is, we hear, to be recognised by the honour of a C.B. The museum is so essentially in great part a study-ground for architecture that it is only fitting that recognition in the shape of honours should be given to the men who have produced this fine work.

IT will be curious to see how the Select Committee of the House of Commons that is considering the provisions of Part V. of the London County Council (General Powers) Bill decide between the conflicting evidence of architects, given particularly with reference to the point whether internal construction should be included within the scope of the Bill or not. On the one hand in favour of this course were Mr. H. D. SEARLES-WOOD and Mr. EDWIN O. SACHS; on the other, against it, were Mr. EDWIN T. HALL and Mr. J. S. GIBSON, as representatives of the Royal Institute of British Architects, and Mr. W. DUNN, who is recognised as an expert in reinforced concrete construction. Perhaps the Committee will follow the course of Sheriff SYM at Perth, who evaded the difficulty of deciding between conflicting evidence of experts by the Scotch verdict of "Not proven," in a claim for damages for interference of right of support. "Not proven" is, in a civil action of course, a failure of the plaintiff to establish his case, and the weight of evidence, supported also by the representative of the Master Builders, Surveyors' Institution, the Institute of Civil Engineers, and the Institute of Mechanical Engineers is against the existing provisions of the Bill.

THE stringency of the Italian law relating to ancient monuments and works of art is so severe that it defeats its own object, and it is practically impossible to prevent evasion, so that one is not surprised to hear that columns and capitals from the Temple of Apollo at Metapontum have been appropriated as building material. The neglect of the Italian Government—or perhaps one should say their financial inability—to deal with all the investigations and explorations desirable for the complete elucidation of Italian archæology and art has resulted in the shelving of work in Magna Græcia, and hence no doubt such vandalism as has now been discovered. However, we understand that the Italian Government are about to take up the work in this part of Italy which they have, dog-in-the-manger-like, refused to allow other nations to undertake.

ARCHITECTURE: ITS TRUE PRINCIPLES.—XIII.

By R. OWEN ALLSOP.

CONTRAST.

THE law of contrast may be said to lie at the root of all architectural effect. Contrast may be of light and shade, of form or line, of kind or position, and other opposites. Sunlight and shadow, smooth and sharp, breadth and length, rough and smooth, are the base of all effects, and if the principle of gradation is also considered most of all art effect is traced to its roots. Without shadow light is not effective, without sunshine the shade is of no value. The expression of RUSKIN, "broad sunshine and starless shade," summarises the noblest attributes of architecture.

An excellent example is to be found in the Greek "egg-and-tongue" moulding. The main effect of this is attributable to the contrast between the rounded mass of the "egg" and the spiny sharpness of the "tongue." If we desired to make a sharp contrast to a sphere we could suggest nothing more opposite to its character than an arrow. The contrast to a circle would be a straight line—but the contrast is evidently one of line only. If we contrast forms of three dimensions, one of which is a spherical body, we require three dimensions in the other. A crude ornament on the egg-and-tongue principle would be a series of spheres alternating with arrows. The ovate form of an egg is more graceful than the sphere and has a varied gradation, hence is more interesting to the eye. The violence of the contrast of the arrow-like tongue and the egg is in the Greek ornament subdued by the addition of a yoke round the egg. The graduation may be described as by means of the circular form of the yoke and its sharp arris, forming a step from soft roundness to spiny sharpness; but for the purpose of illustrating contrast of form, the yoke may be ignored, the root of the ultimate effect being the contrasting round body and sharp body—the arrow head. From this moulding we may learn that sharp and spiny forms brought into conjunction with smooth and rounded surfaces form an agreeable contrast, and that generally in applying enrichment to that which is smooth, round, and graduated, we may best employ sharp forms. Each form improves and adds to the value of the other, just as green and red colours improve and enhance each other's value. The same principle may be applied to the setting out of mouldings; round hollows and beads give a soft graduated shadow suitable for contrast to the sharp arris.

Much the same kind of contrasting effect to that of the egg-and-tongue may be noticed in the eastern

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composition of round dome and tall, thin, needle-like minarets. Here the roundness of the hemisphere adds value to the thin lance-like towers, or more properly, perhaps, one should say that the sharpness of the towers enhances the effect of the domes. Less obvious contrasts are the thin, sharp pinnacles of a cathedral to the long, broad nave roof—a contrast of horizontal to vertical, of large broad mass to small thin ones. All these are effects of contrast, and in similar compositions it is always well to inquire whether the intended contrasts are as effective as they can be made, should it be desired to gain the extreme effect of contrast. Thus in an ornament of the nature of an egg-and-tongue, an ugly ellipsoid and a blunt coarse arrow would fail by reason of insufficient contrast of form; by giving more roundness to the one and sharpness to the other the effect must necessarily be greatly enhanced.

What is a more effective contrast than the square abacus and round echinus of the Doric capital? Above we have uncompromising squareness—squareness of plan and of outline, sharpness of arris horizontally and at the angles, below is a circular plan and a most delicately curved outline. The contrast is one of round to square, sharp to smooth, plane to curve. An octagonal abacus would enfeeble the contrasting members, the octagon form approaching towards the circular. It is to be assumed that the effect of "rusticating" a column is in the same way referable to the contrast of the round shaft and the square rusticated block.

In perspective the round of the column contrasts with the angularity of the square block, the soft graduated shadow of the column contrasts with the regular shading of the plane sides of the block, and the shadow cast by the block adds interest to the eye. So much we suppose; but there is yet none found to suggest that the fashionable rusticating system would benefit the Parthenon even if the shafts of the temple had been unfluted.

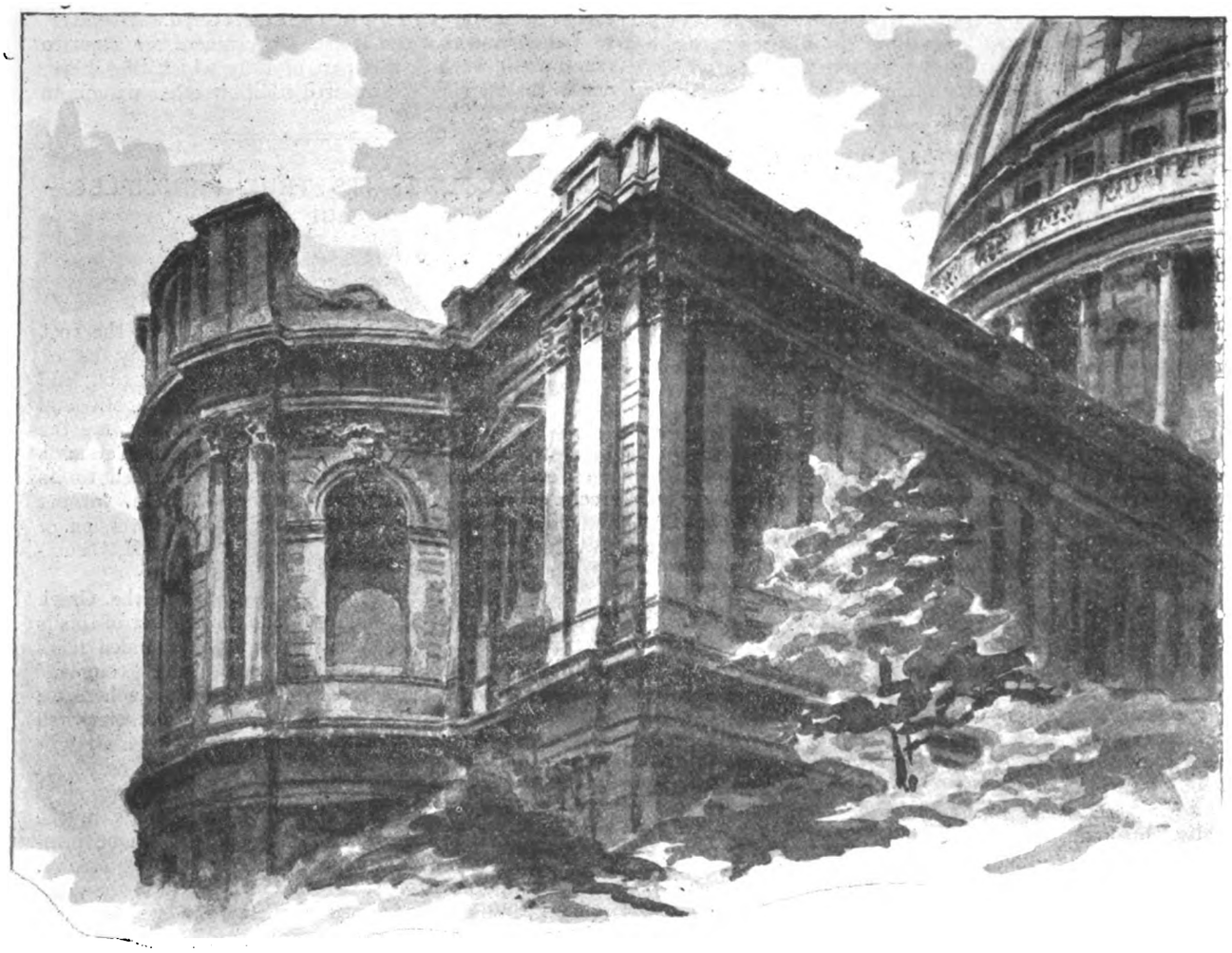


FIG. 33.—ST. PAUL'S.

We have considered first broad and apparent contrasts; others of this quality are the dark arch to the sunlit walling, the plain wall to the enriched portion—such as a diapering, polished to unpolished materials, flat surfaces to round, square masses to round, and to other variously shaped masses. Long horizontal masses contrast to vertical masses as a nave to a tower. Contrast of directions are found in crossing or abutting roofs. Contrasts of large to small are a row of small window lights over one of large dimensions as the lantern lights to lantern arches. Some light can always be thrown on the success of a composition by reflecting as to whether the contrast is bold and powerful, or weak and half-hearted (as in a feeble joke—a half-spoken truth). A notable contrast is the dark triforium opening and the brilliant clerestory. All these are plain contrasts and should be self-evident as such.

In every work of architecture no part of the composition—from sky-line to its most insignificant detail—is independent of the law of contrast for its effect. The thin vertical *flèche* contrasts with the long, broad roof. The light parts of the composition contrast with the shaded portions, as do the recesses with the main wall surfaces. The vertical columns contrast with the horizontal entablature. The lines of flutings contrast with the lines of bases. The main essential of a contrast is the mutual enhancement. A lack of contrast means loss of variety and tends to monotony. The wearisome repetition of parallel lines in the sharp perspective of our buildings would indicate an absence of appreciation

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of the splendid effects to be obtained from contrasting varied form by varying plan. The magnificent effects of St. Paul's Cathedral are effects of contrast—the great square masses to rounded drum of dome. Let many of WREN's compositions be studied, and compared with much flat present architecture with its unvaried plan—the same square lines carried up storey after storey, with perhaps no break but that of the curved plans of the abacus of Ionic capitals. Compare the effect on sharp perspective of St. Clement Danes campanile with its studied variety in plan of the several stages. The upward gaze at a street façade presents generally one monotonous ruling of parallel lines. Observe how different a similar view of the fine Institute of Chartered Accountants with its elegantly varied plans and consequent play of form, line, and light and shade. The basis of these effects is the contrast of plan—square, round, octagonal, hexagonal, curved, and other variations and possibility of endless combinations. WREN made an especial study of contrasted planning, and the result is interesting—truly original composition of mass as distinct from monotonous elevational architecture.

(To be continued.)

THE COAL SMOKE ABATEMENT SOCIETY.

THE annual meeting of the Coal Smoke Abatement Society was held on Friday at the Royal United Service Institution, Whitehall, Sir W. B. Richmond, R.A., president, occupying the chair.

In the course of the annual report it is stated that the Society has now completed the tenth year of its existence. On the whole the members have every reason to congratulate themselves on the extent to which the Society has secured recognition and its objects have achieved success, for substantial progress has been made towards their ultimate goal—the purification of the atmosphere of the Metropolis and other large cities.

Much certainly remains to be done. But it is impossible to avoid recognising that the whole subject of smoke abatement has at last entered the region of practical administration. Ten years ago those who founded the Society met with indifference or derision, or were told that efforts to arouse interest in the work were doomed to fail. The law had been a dead letter in the case of nearly all the Metropolitan local authorities.

The Society therefore had a three-fold mission to perform. It had to stir public opinion to the necessity of steps being taken to abate the evil of smoke from the point of view of the health and comfort of the community; it had to demonstrate (and especially to manufacturers) that black smoke, so far from being a necessary accompaniment to prosperity was an avoidable waste of fuel; and it had to stimulate local authorities to a sense of the responsibilities which they owed to the public in protecting the atmosphere from unnecessary and unlawful pollution.

Public interest has been aroused, and the Rolls of the Patent Office show that the minds of many inventors are being devoted to the perfecting of fuels and appliances designed to mitigate or abolish smoke. Manufacturers are coming to recognize that they are the gainers when they secure perfect combustion of coal, and the plaint is now seldom advanced that it is impossible to avoid the issue of black smoke. Moreover, with a few regrettable exceptions, local authorities, led by the London County Council, take a commendable interest in the work of smoke abatement, and whereas the Society's reports and complaints were originally ignored, they are now generally welcomed as an assistance to effective action.

The Society has had much to do with the measure of success already achieved. By arousing interest; by forming and leading public opinion; by stimulating and fostering healthy competition amongst the makers of smoke abatement appliances and fuels; and by inaugurating a movement for training stokers it has been able to do much. Exhibitions have been organised, with the encouragement and co-operation of H.M. Commissioners of Works and Public Buildings elaborate tests of grates, gas fires and fuels have been carried out, men have been trained, and manufacturers and inventors have been aided. Besides all this, the Society has acted as a centre of advice and assistance for all needing information on the subject of smoke abatement. It is gratifying to the committee to know that in America and on the Continent various organisations have been formed, modelled on the lines of the Coal Smoke Abatement Society.

As an appendix to the report a short summary is added showing the work performed in 1900 and 1908. With few exceptions the smoke nuisances reported have greatly diminished in the areas of Metropolitan Borough Councils. Whereas in 1900 238 owners were reported to the borough councils for nuisances aggregating 15,672 minutes, last year only forty-seven of the same owners had to be reported, the nuisances then emitted only amounting to 4,611 minutes. The returns of sunshine issued by the Meteorological Council show that London is now receiving a much greater share of sunshine than was hitherto the case, and also that the improvement, if not rapid, is a steady one.

During last year 1,380 cases of smoke pollution were reported by the Society's inspector. In 1,323 instances the emission of black smoke was sufficiently constant and considerable to constitute a nuisance, and 1,274 complaints were forwarded by the Society to borough councils and other local authorities. In other and special cases representations were directly made by the Society to the offenders, in the majority of instances with satisfactory results. Indeed, a growing sympathy with the Society's work is manifesting itself amongst manufacturers themselves.

A number of summonses were issued and convictions obtained by local authorities acting upon the reports. As a rule, however, it was unnecessary to adopt this extreme course. For, as a result of the Society's efforts, the administration of the law has become so active and formidable that most of the offending firms took steps to abate the nuisances on receiving cautionary letters or preliminary statutory notices.

On numerous occasions the Society received requests from local authorities to permit its inspector to take observations jointly with their sanitary officers with the object of securing special evidence in regard to smoke nuisances.

With a very few exceptions Metropolitan Borough Councils welcome the co-operation of the Coal Smoke Abatement Society, and the provisions of the Public Health Acts are generally enforced with vigilance. There are, however, some exceptions, notably at Southwark. In 1900, the Society reported three firms within the area of the Southwark Borough Council whose chimneys emitted black smoke during the inspector's observations for a period of 362 minutes; in 1908 the same chimneys were observed by the inspector to emit black smoke for a period of 1,337 minutes, and moreover, four other firms were reported offenders. Last year fifty-two complaints were made to the Borough Council by the Society, nine by the London County Council, and thirty-seven nuisances reported by the Council's own officers. In no instances were proceedings taken, and the Society has pointed out to the London County Council that, in its view, the Southwark Borough Council fails to appreciate its duties to the public under the Public Health (London) Act, 1891.

A similar condition of affairs still exists in West Ham, where the Society has made 3,222 complaints in respect of a large number of firms, without a single prosecution having been initiated by the Corporation.

In the lower reaches of the Thames, too, and especially in the neighbourhood of Swanscombe and Northfleet, there are a number of stacks in connection with cement works and other factories which are notorious offenders in regard to the emission of smoke; but although the nuisances are patent to any observer, and in some cases are so bad as to be almost constant, the local authorities seem unwilling to move.

There has been an extension of the interest taken in the subject of smoke abatement in England and abroad. In the United States of America smoke abatement is receiving much attention, and reports of important investigations have been made public. These reports unanimously concur that it is quite practicable to burn bituminous fuel with proper apparatus or careful stoking without emitting black smoke and with economy to the manufacturers.

The attention of the committee was directed during the spring of 1908 to the North Metropolitan Electric Power Supply Bill, which proposed to enact that the company and its works should not be subject to indictment, action, or other proceedings for smoke or other nuisances. This was to be accomplished by a provision that the company should not be subject to section 81 of the schedule to the Electric Lighting (Clauses) Act, 1899.

The attention of the Committee of the House of Lords was drawn to the matter, and, at the instance of Lord Welby, an amendment was inserted to safeguard the public interests in the matter.

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The Society has been frequently consulted with regard to smoke nuisances in the provinces, and it has been able to render considerable assistance by legal advice and by sending its inspector to prepare special reports, which have been laid before the local authorities, and in some instances have led to an abatement. The instances are unfortunately few; for without similar local societies to organise public opinion, and bring its pressure to bear on the authorities, effective action is very difficult to secure.

Sir W. B. Richmond, the chairman, in moving the adoption of the report, laid emphasis on the good work that had been achieved by the Society in its ten years of existence. When their operations were commenced the clause relating to smoke nuisance from factories, &c., was a dead letter, and public opinion was dormant. But now this had been changed and the Society instead of being called faddists or Utopian dreamers has become recognised as a practical body and assumed not merely a national but an international character. Some significant figures have been published by the Meteorological Office. From 1880 to 1892 the yearly average number of fogs was 69; from 1894 to 1899 the average was 56; in 1900 13 were recorded, and the yearly average since that date has been 31. Twenty per cent. of these fogs consist of smoke and nothing else, the remainder are gravely aggravated and increased in density by smoke. The sunshine in London last year also formed a record. But the Director of the Royal Meteorological Council has proved that in the City 83 per cent. of the burning power of the sun is lost in the winter months. It is of course impossible to be wholly rid of white fogs which are incidental to an insular position; but it is possible to be rid in a large measure of black fogs.

Sir William, after referring in detail to the encouragements and discouragements met with in the course of their work, then continued:—

The history of England is visibly enshrined in our great cathedrals, whose walls silently illustrate the great objects and deeds of our predecessors. From the kings who have ruled, the statesmen who have guided, to the craftsmen who created and wrought these great fabrics; the minds which conceived them, the master masons under whom they were created, and every trade and craft employed upon their embellishment, our cathedrals are trusts left to us to maintain and to preserve from decay, except from that which is in the nature of all things, the effect of time.

And to Londoners, even one might say to all English-speaking people, our abbey of St. Peter's in Westminster is the most beloved of all our edifices. No one needs reminding of its antiquity, its beauty, and of the countless treasures contained within its walls; of the kings and queens who lie buried there, and of the costly and magnificent tombs erected to the memory and delivered over as trusts for all time.

Do you wish to hand down to future generations as far as it is possible intact one of the chief objects of pride in our city? Of course you do. But in the multifarious demands made by modern materialism, the many poisons in the air wherever the swift, relentless wheels of commerce beat up the dust of destruction, the attractions of history and of art, of national sympathy with the past, the very foundation of all we now possess may take too limited a place in the modern mind.

It is a fact that Westminster Abbey has suffered from more rapid decay in the last hundred years, to give a broad limit, than occurred in all the years of its previous history. So serious has this decay become that an authority of the abbey approached the Coal Smoke Abatement Society, and a report furnished to the Society by Dr. John Owens, from which I am permitted to quote, is the result of the preliminary investigations. Personally I have many times visited the abbey, and can endorse all that the report states, though I have no pretensions to more than a very superficial knowledge of even the simpler departments of chemistry. I am able only to give you some of the chief points embodied in it. The Society hopes to carry the investigations much further by means of a special committee of distinguished experts whose report will be set before you in due course.

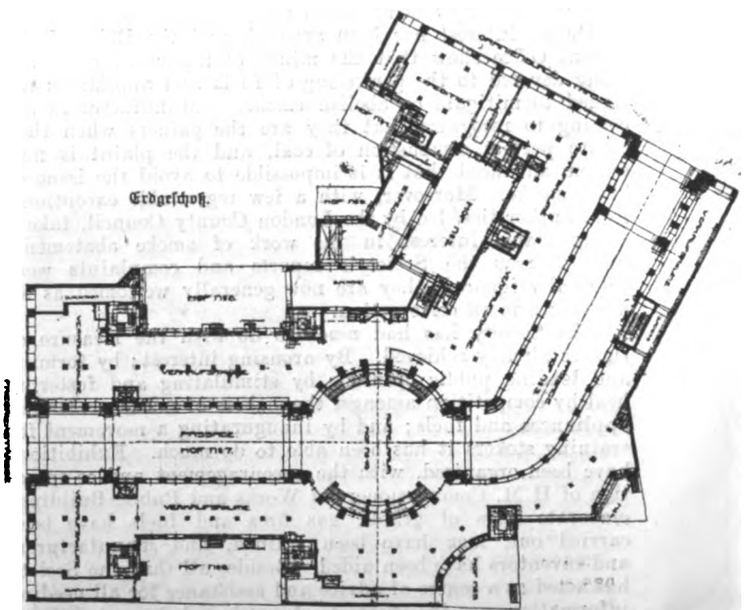
Repairs executed only from twenty to twenty-five years ago are decayed more or less. Those of the south transept and parapet are badly decayed. Work executed only fourteen years ago is in a bad state, and that done in 1701 shows signs of being reduced to a friable mass to a considerable depth below the surface. That this decay is the result of acids deposited by smoke and otherwise there can be no doubt whatever.

The chief cause of the destruction of the stone work has been shown to be the presence in the air of sulphur acids; the stone is converted into sulphate of lime; in the process of its formation this disintegrates the stone by expansion. The connection between smoke and stone decay appears to be invisible gases emitted from the smoke particles. It is now known that soot particles, though in themselves injurious, act as absorbents for the sulphurous acid produced from the sulphur in burning coal. The soot therefore is a vehicle for destruction though not in itself a destroyer. Another connecting link between stone decay and smoke is fog, in which the solid matter of the smoke plays an important part.

The particles of a London fog may be regarded as little spheres of acidulated water collected round nuclei of solid matter and probably coated with a tarry or oily skin derived from smoke. In a smoke fog, that is, a fog which is not due to moisture, the amount of acids is enormously increased; it has been shown by analysis of the air of London that the presence of a black fog increases the amount of sulphur about six times. Dull days in moist fog gave an average of 0.04 per 100 cubic feet, a black fog 0.224. In Glasgow on the suggestion of Sir J. Ure Primrose the rate of smut-fall was measured, and it was calculated that 22 cwt. per acre fell during the year; according to Sir William Thiselton Dyer's experiments at Kew nearly 2 tons are deposited per acre. In London the amount must be much greater. The summary of Dr. Owen's masterly report is:—"The chief points in connection with the preservation of the abbey where the work of the Society might be of value appear to me to be as follows:—(1) In reducing the amount of solid soot deposited on the stone work, and therefore the amount of sulphuric acid carried by it. (2) In reducing the frequency of black fogs, during which the corrosive properties of the air are greatly increased. (3) In encouraging the burning of fuels which contain little sulphur, and which at the same time produce no smoke; or the extended use of electricity." To the latter part of this sentence I append a note of my own, viz., no electrical generating station ought to be permitted to throw off any smoke at all. (4) "In encouraging the greatest possible care to reduce sulphur in coke, coalite, carbo, and other fuels."

The foregoing statements apply to all our cathedrals which happen to be surrounded by manufactories, to all buildings, to all works of art, of architecture, sculpture and painting, to all embroideries and fabrics. It is time that we took such a state of things into consideration and united together in a phalanx as far as possible to be rid of it, shutting our ears persistently to a constantly reiterated untruth, that smoke and successful commerce are necessary concomitants; we all know that they are not so.

We do not intend to hold our hands, we have not done fighting for pure air and light; we mean to go on, we mean to allow no plausible or superficial excuses of obviously interested persons to prevent our determination to get the country upon our side; even when we are richer we will go on with the same energy as we do now. We claim the right as citizens to criticise public bodies and we appeal to all English lovers of justice to lend us a hand; especially we ask the Press to give us its valuable help, even at a moment when the Budget and sky-flyers are in the ascendant, and terror of invasion is in the air.

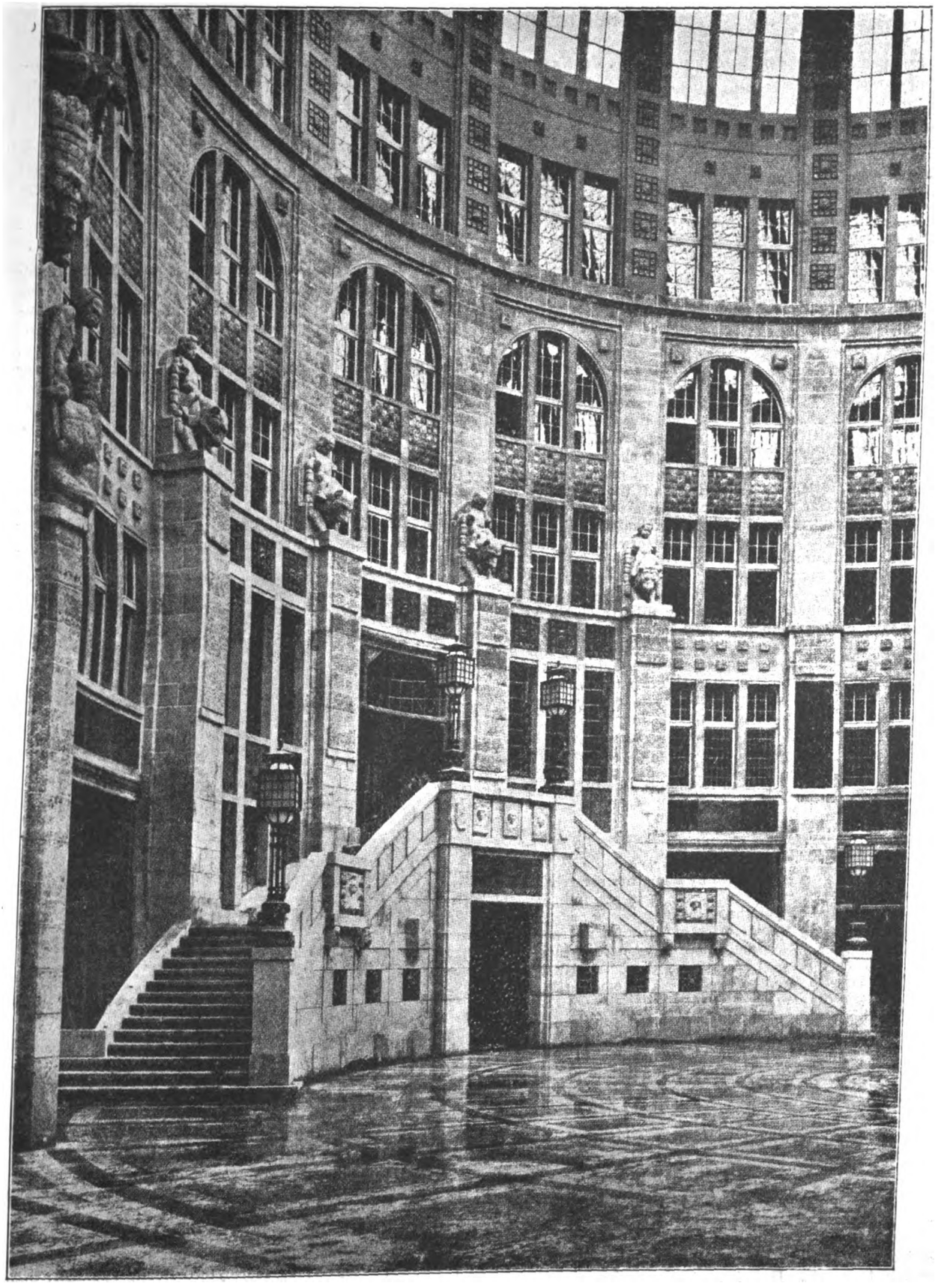


GROUND PLAN OF ARCADE IN FRIEDRICHS-STRASSE, BERLIN.

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The sky-flyers will get above the smoke and grumble that they cannot see the earth. And anyhow don't let us leave the clearing of the atmosphere to another great nation, great because it takes account of small things as well as big, an industrious and active nation, our near relatives in race.

We can do it if we will to, and keep before us that each one of us has a right to every ray of the sunlight obtainable, for reasons of health, happiness, vigour, out-of-door life, for the poor almost more than for the rich, for nature's and for art's sake.



THE DOMED CENTRAL COURT OF ARCADE IN FRIEDRICHS-STRASSE, BERLIN.
KAISERL. BAURAT AHRENS, Architect.
(From *Der Profanbau.*)

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FIREPROOF PAINTS.

AT the last meeting of the Paint and Varnish Society at Painters' Hall, Little Trinity Lane, E.C., Mons. Ch. Coffignier read a paper dealing with "Fireproof Paints." In the course of his remarks he said all the fireproof paints known up to the present day owe their particular properties to the presence of ammoniacal salts, and their fireproofing action is due to the liberation of ammonia on heating.

We are indebted to Mons. J. A. Martin for the following formulæ:—

Formulæ for Fireproofing Compositions (*Martin*).

1.	Sulphate of ammonia	8 parts.
	Carbonate of ammonia	2½ ,,
	Boric acid	3 ,,
	Borax	3 ,,
	Starch	2 ,,
	Water	1,000 ,,
2.	Ammonium hydrochloride	150 grs.
	Boric acid	50 ,,
	Animal glue	500 ,,
	Gelatine	15 ,,
	Water	1,000 ,,
3.	Ammonia hydrochloride	80 ,,
	Boric acid	30 ,,
	Borax	20 ,,
	Water	1,000 ,,
4.	Ammonia sulphide	80 ,,
	Boric acid	30 ,,
	Borax	20 ,,
	Water	1,000 ,,

By adding whitening to No. 2 formulæ the author professes to produce a fireproof coating, but with very indifferent success. Moreover, all these salts of ammonia are soluble, and it will readily be understood that their use is not conducive to the preparation of high-class paints.

It is the same as regards paints with an asbestos base. These paints settle very rapidly, and the difficulty experienced in putting them right again is a serious drawback. We must also add that they are very alkaline, and that is even a more serious drawback than the former. In fact, the coating they produce cannot be compared even with the commonest paint. Some time ago, in conjunction with M. Verine, I investigated the possibility of using magnesium ammonium phosphate, which is the only insoluble ammoniacal salt, and consequently may enter without ill effects into the composition of a paint. We found that this salt generated ammonia at a temperature of 150 degrees C., and that by simply incorporating it with ordinary paint, a coating is produced which is already less combustible than ordinary paint; but we obtained a much more decisive result by preparing a special varnish, having as a basis a metallic salt of linoleic acid, linoleate of lead for preference, dissolved in turpentine or benzine.

In order to obtain a fireproof paint it will be sufficient to grind the following mixture with this varnish:—

Powdered asbestos	75 ks.
Magnesium ammonium phosphate	75 ks.
Powdered white-lead	100 ks.

The white lead may be replaced by any other pigment. As far as the use of asbestos is concerned, it is not indispensable, but it reduces the cost of the paint.

I have made a whole series of experiments with these paints, ordinary paints and alkaline asbestic paints.

Here is a series of panels painted, some with ordinary paint, some with fireproof paint. You can easily see the characteristic differences.

On these boards being exposed for a couple of minutes to the flame of a Bunsen burner, with ordinary paint, the flame spreads very rapidly over the whole length of the panel (14 cm.). The board with fireproof paint is attacked only to a length of from three to four cm.; the paint becomes charred, but does not blaze; or if it does, it is only for a few seconds, and that very feebly.

This phenomenon may be explained by the fact that the action is local, and the wood unavoidably takes fire owing to the disintegration of the paint. But the flame does not spread; if the action of the heat is prolonged the spreading is in a great measure retarded; that is precisely what is required of a fireproof paint.

We have modified the above composition for the painting of ironwork and have prepared a special paint, which covers well in two coats. Here is an iron panel which has received three coats; you can see that the paint is slightly glossy and smooth; it lends itself, therefore, to decorative effect much better than ordinary paint.

The result obtained from the standpoint of incombustibility is very good indeed. You may hold this panel in the blue flame of a Bunsen burner, and it will show no tendency to flare, the paint merely blackens and adheres to the iron. Whereas, if I make the same experiment with this other panel, it only needs a few seconds to set up a general conflagration.

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 10. MR. H. T. HARE, F.R.I.B.A.

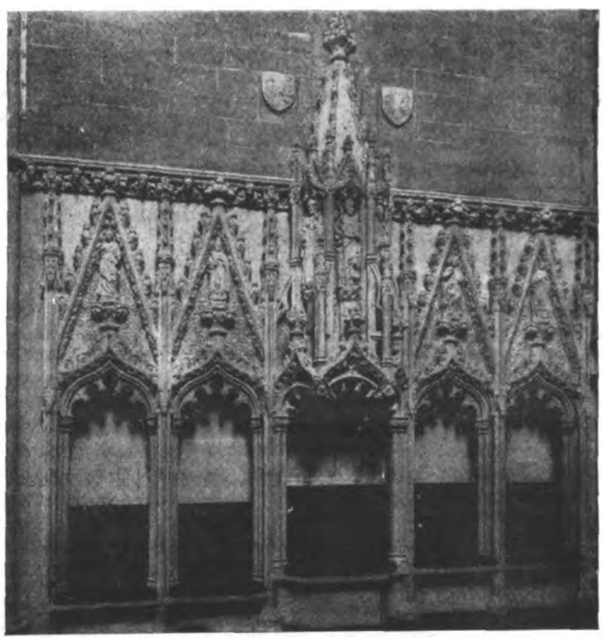
MR. H. T. HARE has already served the office of Vice-President, and has recently been elected Hon. Secretary of the Royal Institute of British Architects. He is one of our modern architects who has climbed to fame by the ladder of competitions.

NO. 11. MR. THOS. W. CUTLER, F.R.I.B.A.

MR. THOS. W. CUTLER has served on the Council of the Royal Institute of British Architects, and is well known for his domestic and semi-domestic work.

NEW REREDOS, PARISH CHURCH, ALL SAINTS, HOVE.

THE centre panel of this reredos is an historical representation of the Crucifixion. The figure of the SAVIOUR is one of great dignity; the expression is intended to denote pity for the sins and sorrows of men. There is a nimbus of angels, two of whom hold a crown. Around the Cross are the Virgin MARY, the two other MARIES, St. JOHN, the centurion, a soldier, and a Pharisee. On the north side of this panel are three types, one above another—viz., ISAAC with the wood, MOSES with the brazen serpent on a pole, and DAVID with a harp. On the south side there are shown the three prophets ISAIAH, JEREMIAH, and DANIEL. On the seven shields below are emblems of the Passion. Between the window lights are four angels under canopies. The wall spaces on either side of the altar are



divided into niches containing figures of St. STEPHEN, St. GEORGE, and St. ANDREW on the north side, with St. PATRICK, St. ALBAN, and St. DAVID on the south. On the north and south walls are the bishop's seat and the sedilia, the figures being of ecclesiastics who can be directly or indirectly connected with the See of Chichester. The design was made by the late J. L. PEARSON, R.A., the architect of the church. It has been worked out in detail by Mr. FRANK L. PEARSON, his son, and has been executed under his supervision by Mr. NATHANIEL HITCH, sculptor, 60 Harleyford Road, Vauxhall, S.E.

VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON.—WEST CENTRAL COURT—PRINCIPAL ENTRANCE—INTERIOR OF ENTRANCE HALL.

FOR description of this building we may refer to our leading article on the Victoria and Albert Museum, page 1.

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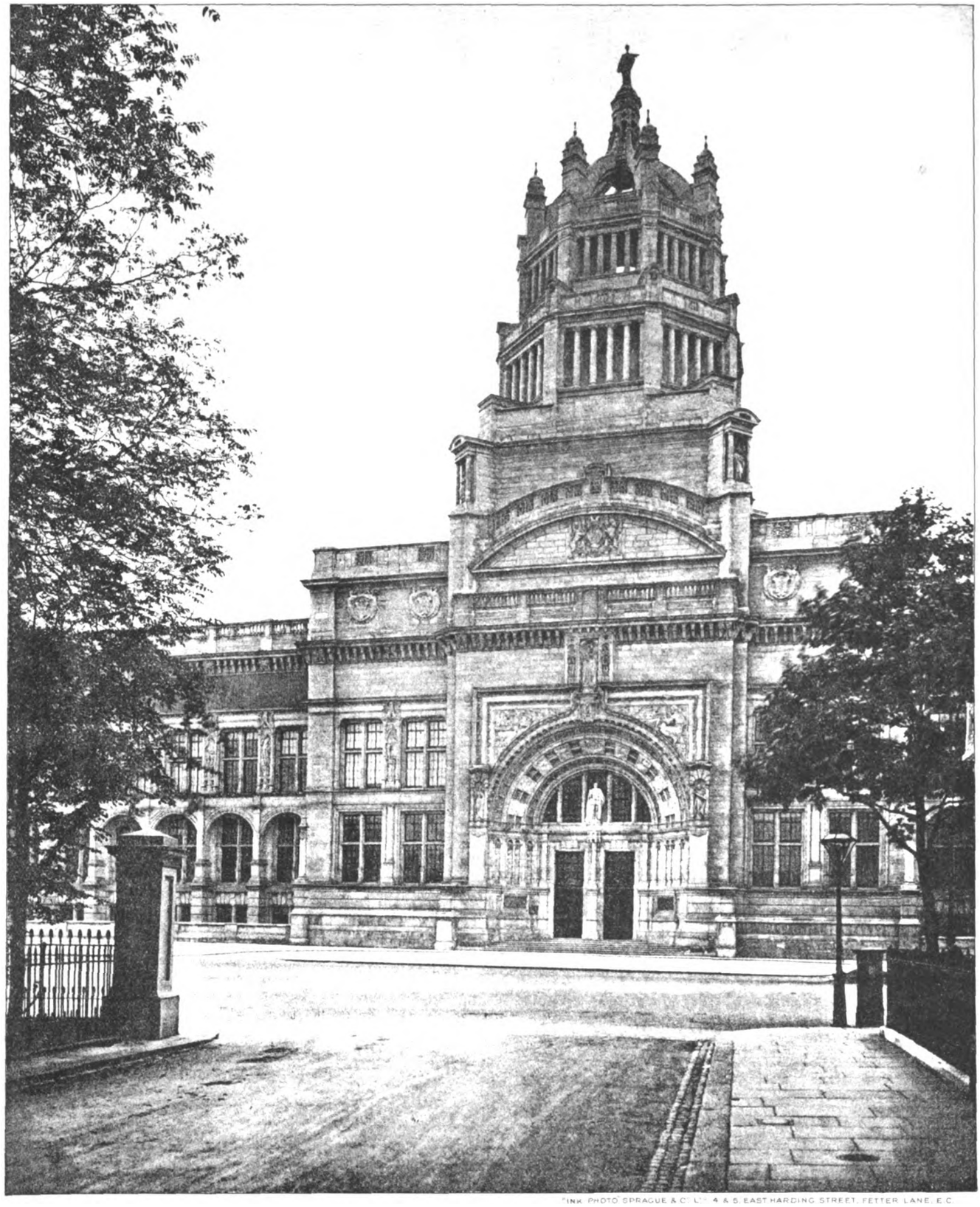
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LIVING ARCHITECTS. No. 10: MR. H. T. HARE, F.R.I.B.A.

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VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON: PRINCIPAL ENTRANCE.

SIR ASTON WEBB, R.A., Architect.

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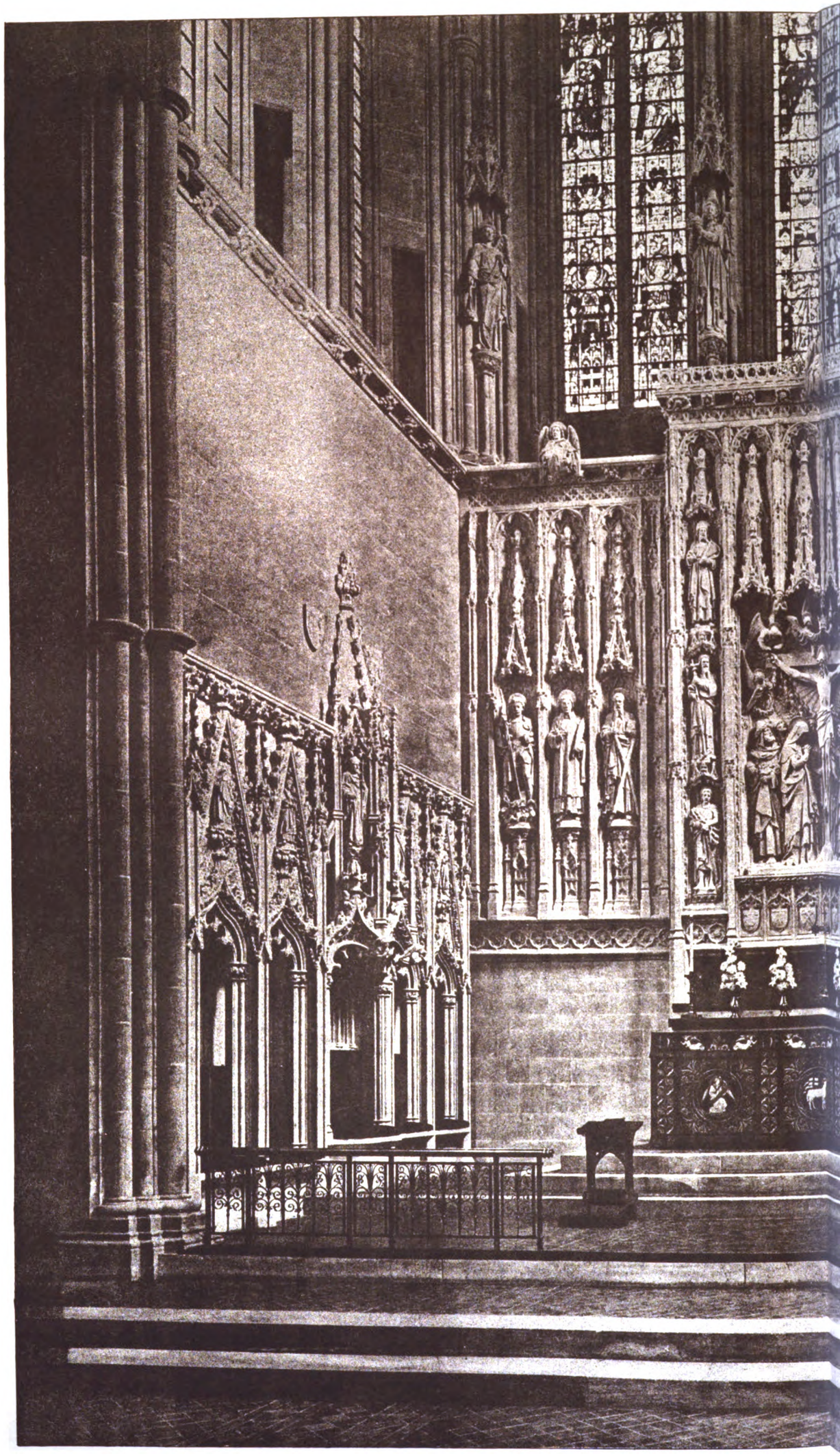
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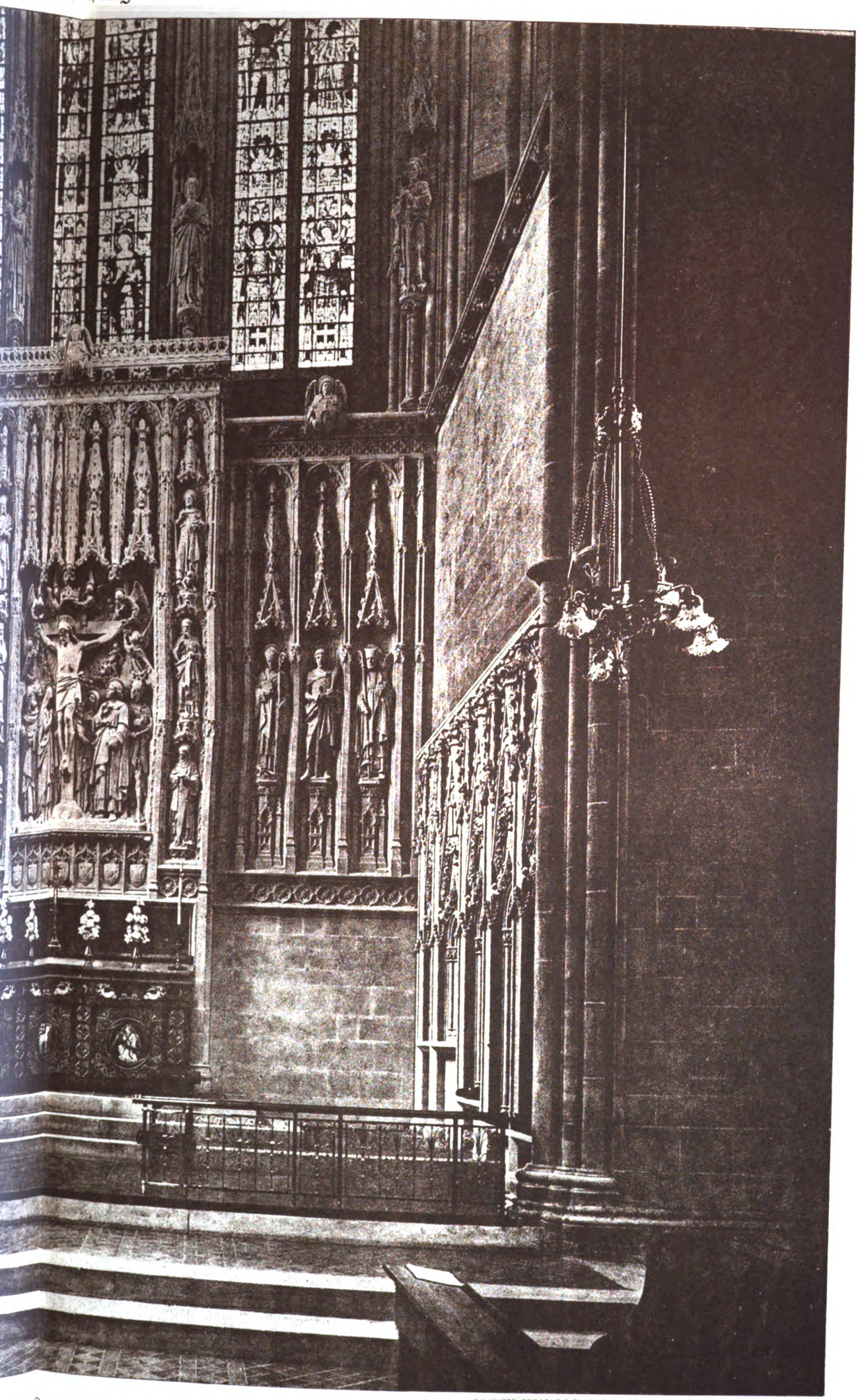
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NEW REREDOS: PARISH C

FRANK L. PEARSON

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PARISH CHURCH, ALL SAINTS, HOVE.

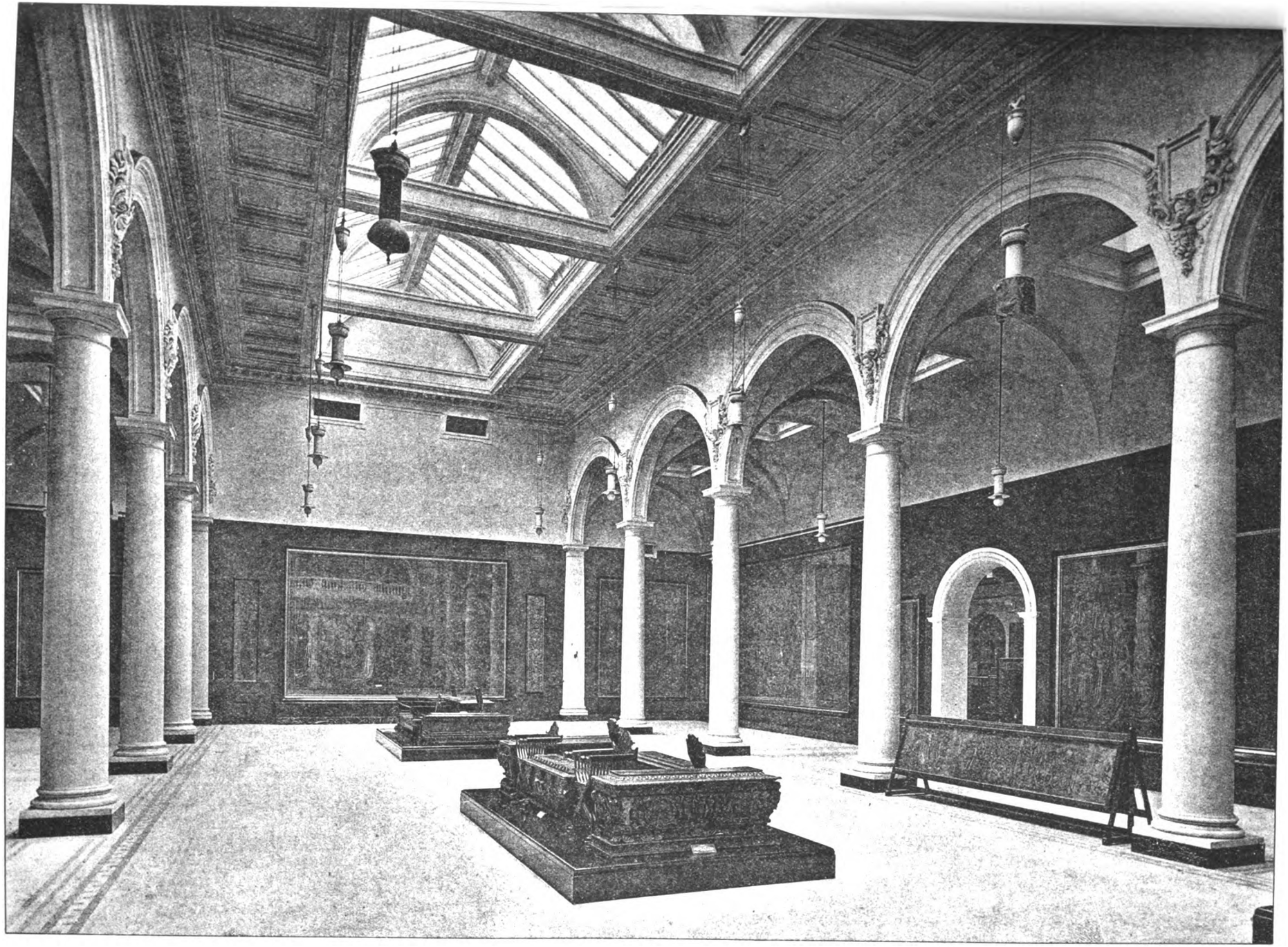
L. PEARSON, F.R.I.B.A., Architect

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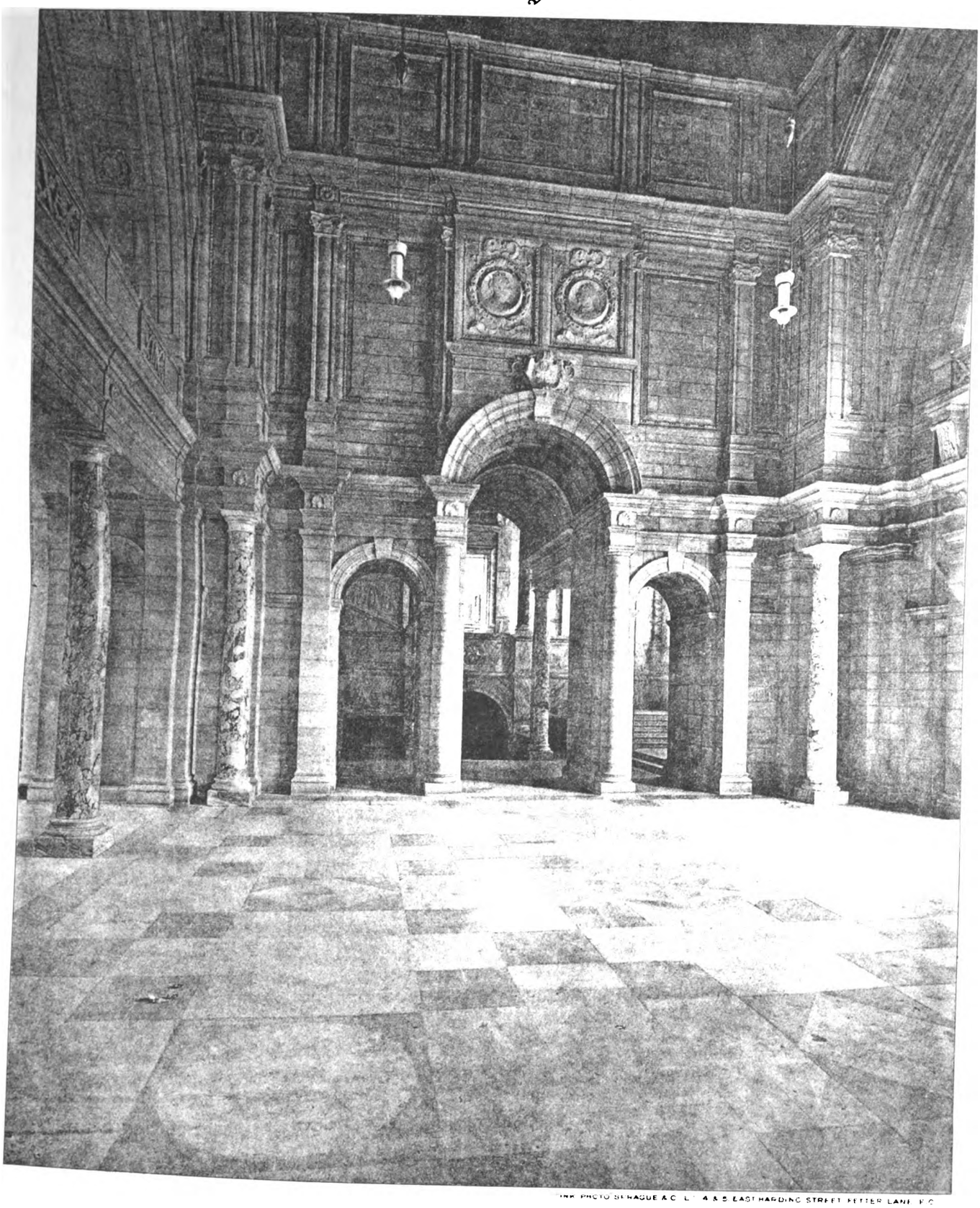
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VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON: WEST CENTRAL COURT

SIR ASTON WEBB, R.A., Architect

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VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON: INTERIOR OF ENTRANCE HALL

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LIVING ARCHITECTS. No. 11: MR. THOS. W. CUTLER, F.R.I.B.A.

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SIR JOHN MOORE CENTENARY.

AN event of the past week was the viewing of the clay model of the bust of Sir John Moore by Professor Bohanni. The committee are to be congratulated on the result of Professor Bohanni's efforts. The photograph from which our reproduction was made was taken by Mr. Max Judge. The bust is to be cast in bronze, and is to be embedded in a memorial shaft of silver-grey granite, to be erected on the



parade at Sandgate, close to the spot where Sir John Moore resided while he was forming the camp at Shorncliffe.

The centenary of the death of Sir John Moore and of the battle of Corunna was celebrated all over England, as well as in Spain, in January last. The Sandgate and Shorncliffe commemoration will take place during the present month.

GUILD OF ARCHITECTS' ASSISTANTS.

A WELL-ATTENDED meeting was held at Cardiff on June 18 in Messrs. Lanchester & Rickards' New Law Courts, to consider the formation of the Guild of Architects' Assistants, Mr. Lumsden presiding.

The Guild of Architects' Assistants was recently formed in London, the object being to remedy a state of affairs which has been growing more and more acute in recent years, and caused chiefly by the lack of co-ordination and unity between practising architects and their assistants. It is the outcome of a desire to protect the interests of properly qualified assistants from unfair competition, while securing for practising architects the advantages of knowing that they were only engaging qualified men, and at the same time uniting both parties in an endeavour to further the interests of the profession generally.

Mr. E. J. Dixon, A.R.I.B.A., London, founder of the Guild, delivered an address in favour of establishing a branch of the guild for South Wales and Monmouthshire. He pointed out the practical advantages of unity, saying that the sweet days of the Victorian era were passed when the principal took a real interest in his pupils. A different class of principal had arisen—a class of men in a hurry to get rich—and the result was that the position of the assistant had become extremely acute. He referred also to the architectural assistants turned out by the schools, colleges and even the university, without any attempt to regulate the supply.

It was these facts, these new phases of the question, which had given rise to the Guild. The assistants must combine for their own support and so be able to insure themselves against the many and various difficulties which arose in the course of their business. The benefit gained by mutual help would be of immense advantage to the rank and file of the profession. He drew attention to the fact that, for the great majority of the assistants, architecture was first and foremost their means of gaining a livelihood, and some steps ought to be taken to render that livelihood less precarious than was at present the case.

The Guild could act in a variety of ways for the benefit of its members. A principal had his remedy against an incapable or fractious assistant, but the assistant had no remedy in those cases where he was at the mercy of an unscrupulous employer. The guild would have to undertake cases of this kind, first by friendly remonstrance to the principal, and then by such other means as the nature of the case might suggest.

Then an employment bureau would be formed and an allowance made to those out of a berth. Endeavours would be made to organise a system of registration on a large scale so that by the central body or local branches having a list of vacancies, which could be supplied by sympathetic employers, they would be able to place many in situations who at present were unable to avail themselves of such advantages.

Statistics would have to be obtained in all centres as to the number of assistants and the percentage of unemployment before any definite unemployment scheme was adopted, but the tentative proposal was to pay a thirtieth of the salary to the funds, and receive a half of the salary when unemployed.

There was also the question of the graduation of salaries, which undoubtedly bristled with difficulties, yet he believed it was far from being impossible of solution. Much more could be done by the grading of assistants into their respective spheres as designers, draughtsmen, constructionalists, &c., and by co-operation of employers he had no doubt much could be accomplished in this way and so remedy a state of affairs under which some of the best men in the country were working for salaries no larger than paid to an artisan.

He also referred to a scheme of education, pointing out the anomalies of the present examination system.

Finally he invited all to do their best to bring the guild into active operation, and to see that it did not fail by reason of lack of energy. There was no body at present dealing exclusively with the interests of assistants, who were fast becoming a most important section of the profession; and it was for the guild to fill up this gap and unite all for their protection and advancement.

An animated discussion then took place in which several points of interest relating to the constitution of the branch and the scope of its work were satisfactorily answered by Mr. Dixon, and the following resolution was thereupon adopted:—

"That this representative meeting of architects' assistants, supported by several well-known local architects, recognising the urgent need of combination and union in order to further their professional interests, resolves that a branch of the Guild of Architects' Assistants for South Wales and Monmouthshire should be formed, with the headquarters in Cardiff, and that a committee be forthwith appointed for that purpose.

The provisional committee was then re-elected with power to co-opt others, Mr. S. Bowen Williams, of 110 Miskin Street, Cardiff, being appointed hon. secretary.

The Bolton Libraries Committee have decided that Messrs. Bradshaw & Gass be requested to prepare working drawings, specifications, &c., for the erection of the branch libraries at Astley Bridge and Great Lever, and Messrs. Henderson & Brown those for the building at Halliwell. Tenders are to be invited for the erection of the buildings.

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EDINBURGH ARCHITECTURAL ASSOCIATION.

THE annual excursion of the Edinburgh Architectural Association will take place to-morrow, July 3, to Dunblane and Doune. On arrival at Dunblane by train the visitors will proceed to Dunblane Cathedral, where half an hour will be spent under the leadership of Mr. Hippolyte J. Blanc, R.S.A., F.R.I.B.A. The following notes have been prepared of this structure, which dates from the close of the thirteenth century, with some remains of an earlier foundation of David I. in the twelfth century; the main part of the edifice was founded by Bishop Clement about 1233. It consists of a nave of eight bays, with north and south aisles, an aisleless choir of six bays, an aisle-like attachment on one side of the choir, from which alone it is entered, a square tower of early formation oddly incorporated in a part of the south aisle of the nave. The tower bears some of the characteristics of the round towers of Abernethy and others, though, in this case, square. An interior arched recess shows some familiar details.

The two upper stages of the tower are of later date, and the parapet stage is probably of the sixteenth century. Judging from the details, the oldest part of the inner fabric is the long attached building on the north side of the choir, generally supposed, from the existence of certain appropriate features, to have been a lady chapel. An upper storey to this building is assumed to have been a scriptorium. The choir is of slightly later date. The window tracery in choir and the pinnacles of the buttresses are not the original. The crest of Bishop Chisholm, with date 1500, appears on one. The nave, 129 by 57 feet, including the aisles, bears very graceful and interesting detail. There is no triforium, but the clerestory has a passage-way in the thickness of the wall, which has double traceried perforations of elegant form. The west gable is most elegant, forms and details being exceedingly refined, while the doorway is deeply recessed with clustered shafts on in-goings. Three lancet-pointed windows fill nearly whole gable, upper part having vesica, with beautifully relieved decoration. The wall is built in two thicknesses, each perforated, as in the clerestory. The roof is of timber, in barrel-arch form. The cathedral is without transepts, contains many interesting features in doors and windows, also a few well-preserved oak-carved stalls and sculptured monuments. Nave recently roofed in and restored.

The next place to be visited will be Queen Victoria school, Dunblane (Messrs. John A. Campbell and A. D. Hislop, architects), where Mr. J. A. Campbell, F.R.I.B.A., will act as leader. The school, which also provides a residence for the boys, is, for the sake of economy, all planned under one roof, the pavilion type of plan originally proposed being abandoned. On the basement floor are the boiler-house, laundry, wash-house, drying chamber, &c. On the ground floor are the central hall, class-rooms, dining hall, serveries, kitchen and offices, cloak-rooms, lavatories, and day sanitary blocks. On the upper floors are the dormitories, and convenient to these are the ablution and bathrooms, night sanitary blocks (cut off from main building), reading room, boot-cleaning rooms, &c., student teachers' rooms, with private bathrooms and reading-room. The building is heated throughout by the Reck system. The problem of the building has been to provide a large amount of accommodation at a moderate cost. The houses in the ground are an adjutant's house and a residential block of twelve houses for non-commissioned officers and similar staff. The chapel is of a more architectural character in Late Decorated of a Scottish type. The building is harled with stone dressings from Auchenheath Quarry, and the roof is covered with Precelly slates of rustic green, mixed.

After luncheon at Stirling Arms Hotel, Dunblane, the visitors will drive to Doune Castle, the property of the Earl of Moray. Mr. Hippolyte J. Blanc will again act as leader.

Doune or Dun-a-hill castle is a good example of the evolution in the fifteenth century of the courtyard group of buildings from the simple square keep of the fourteenth century. Built by Murdoch, Duke of Albany, early in the fifteenth century. He was executed by decree of James I. in 1424, when the castle lapsed to the Crown, and was bestowed on the Queen of James IV., from whom it passed to the Stuart family, and remains the property of the Earl of Moray. The site possesses great defensive advantages. The north-east angle may be viewed as an enlarged keep, without internal communication with the other buildings, a usual arrangement in castles of the period in England and France. The area enclosed with buildings is about 155 feet by 143 feet. The main entrance is by an arched pend under the keep, protected by wood doors, iron gate and portcullis, the latter worked from an apartment immediately over. The ground floor contains guard room, prison, and a series of cellars. On the first floor of the keep is the great hall, 44 feet by 26 feet, and 24 feet 6 inches high, entrance to which is from outside stair only. Private rooms in the floors above are reached by a staircase from this hall. The first floor contains, in addition to the private hall, a large refectory or banqueting hall 67 feet by 25 feet, with kitchen and servery. There are many interesting features and details all in a good state of preservation. The castle was occupied by the rebels in 1745, and from that time up to about thirty years ago it remained ruinous and roofless. For preservation it was then re-roofed, and many details, so far as could be revealed, were renewed.

BRITISH CONSTITUTION ASSOCIATION.

THE Conference on the taxation of land values convened by the British Constitution Association and held at the Whitehall Rooms, Hotel Metropole, under the presidency of Lord Balfour, appointed a deputation to wait upon the Government, and the following letter was addressed to the Prime Minister:

"23 Charing Cross, June 19, 1909.

"The Right Hon. Herbert Henry Asquith, M.P., Prime Minister.

"Sir,—We write on behalf of a number of organisations connected with land whose representatives have met in conference to consider the land tax proposals of the Budget. The Conference unanimously agreed to make an appeal to his Majesty's Government to withdraw these proposals. In the opinion of the Conference they make an unjust and unintelligent distinction between property in land and other kinds of property. No such distinctions can, we submit, be drawn relevantly to taxation, and we deprecate financial proposals which by natural extension not more irrational than themselves might be made to justify the nationalisation of land. This proposed departure from principles which have hitherto been upheld by the Legislature of the United Kingdom would so seriously affect all classes of the community that the Conference appointed a deputation to wait upon his Majesty's Government in reference to the matter, and we trust that you will be good enough to appoint an early day for receiving the deputation. We are your obedient servants,

"BALFOUR OF BURIEIGH (*President*).
"HUGH CECIL (*Vice-President*).
"MARK H. JUDGE (*Hon. Secretary*)."

Among the organisations represented on the Conference are the following:—The Auctioneers' Institute, the Berks and Oxon Chamber of Agriculture, the Birkbeck Building Society, the British Constitution Association, the British Land Company, the Building Bye-Laws Reform Association, the Central Chamber of Agriculture, the Chatham Cottage Owners' Association, the Commercial Union Assurance Company, the Devon and Exeter Architectural Society, the Eagle Insurance Company, the Estate Agents' Institute, the Exeter Building Society, the Incorporated Association for the Protection of Property Owners, the Leeds Building Society, the Liverpool Building Societies (three), the London Friendly Institution, the London Master Builders' Association, the Surveyors' Institution, the Seabrook Estate Company (Limited), the Society of Architects, the Scottish Land and Property Federation, and the Western Suburban Building Society.

On June 25 the Hon. Secretary wrote to point out that the members of the deputation reside at such distant places as Edinburgh, Liverpool, and Exeter, and asked that, if possible, three days' notice of the time fixed for receiving the deputation may be given.

In reply the following letter has been sent:—

"10 Downing Street, Whitehall, S.W.,

"28*th June*, 1909.

"Dear Sir,—I am directed by the Prime Minister to acknowledge the receipt of your letter of the 25th instant, and in reply to your letter of 19th instant, in which you request him to receive a deputation from the British Constitution Association with reference to the Taxation of Land Values, I am to say that he very much regrets that his engagements are too numerous to permit him to do so.

"Mr. Asquith has, however, forwarded your letter to the Chancellor of the Exchequer, and he now understands that Mr. Lloyd George is willing to receive the proposed deputation. You will, no doubt, shortly receive a communication with reference to this matter from him.

"Yours faithfully,

"MARK STURGIS.

"Mark H. Judge, Esq., Hon. Sec. to the Conference."

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The following Members of the Conference have undertaken the preparation of the Memorial which will be presented by the Deputation:—

Lord Balfour of Burleigh (President), Lord Hugh Cecil (Vice-President), Mr. Thomas Ambler, Lord Avebury, Mr. Edward Bond, Mr. James Boyton, Sir William Chance, Mr. Wilbraham N. Cooper, Lord Cottesloe, Earl of Cromer, Earl of Dalkeith, Sir George Darwin, Earl of Dysart, Mr. Edwin Evans, Mr. Howard Frank, Mr. S. Hutchinson Harris, Mr. Herbert Michell, Mr. Clarence F. Ravenscroft, Mr. C. F. Ryder, Mr. Alex. R. Stenning, Mr. J. St. Loe Strachey, Mr. Percy B. Tubbs, The Hon. Percy Wyndham, and Mr. Mark H. Judge (Honorary Secretary).

The adjourned meeting of the Conference to consider the reply of the Government to the Deputation will be held at the St. James's Hall, Great Portland Street, on Tuesday, July 20th, Lord Balfour of Burleigh in the Chair. Organisations connected with land not yet represented are invited to send four representatives to the adjourned meeting.

ELECTRIC LIGHTING AND FIRE RISKS.*

THE increasing number of fires caused by electric currents in buildings recorded in the fire brigade annual reports is my excuse for bringing up for discussion the subject of "Electric Lighting and Fire Risks" together with the question of the most efficient methods adopted of wiring buildings for electric lighting and power installations from the point of view of the fire brigade officer. Reviewing the origin of these causes we find the majority result from the fusion of gas pipes by a short circuit being formed from charged electric wire tubing, metal beams or columns and gas tubing. The principal cause of these defects is in my opinion due to the metallic conduit system.

I think it will be admitted that the metallic conduit has not fulfilled all the anticipations of its early promoters; as, notwithstanding the many improvements due to the introduction of screwed joints, metal junction boxes, &c., the metallic conduit has introduced to the electric light and power installations an element of danger which was unforeseen and unexpected, which may not be wholly confined to buildings in which it is installed, but which may be communicated by means of girders, columns, or water and other pipings to adjacent buildings.

It is impossible to avoid metallic contact with electric conduits, more especially in modern buildings where steel or iron and concrete form such large factors. A leakage on to iron girders or columns may travel through a building from top to bottom, or from one building to another before it gets to earth, or before it is picked up by a gas pipe, and thence conveyed to earth.

From information I have been able to gather, and from experience in my own city, many fires have been caused by such short circuiting of electric conduits on to gas pipes, or by leakage on to water pipes thence to gas, by girders on which gas pipes are in contact, by nails or staples bridging the current through joists or partitions, leakage of current from conduits on to damp walls thence on to gas pipes or brackets, the factors in each case being the conducting power of the metallic tubing.

It is difficult to suggest a remedy for the leakage of current on to the metallic conduits owing to the many breakdowns due principally to the conduit itself.

Amongst the defects which were not anticipated may be enumerated:—Those due to rough internal surfaces of the tube; barbed edges left by screwing dies; oil for lubricating the dies left in tubes; imperfectly insulated wire jointings; tubing not earthed or imperfectly earthed; vibration caused by moving heavy loads on floors; shorts on to small junction boxes due to imperfectly insulated joints being jammed into small space. The pulling of long lengths of wire through the tubing round bends, and often over sharp edges of tube, which damages the insulation. The tubing is frequently kept small for appearance sake, and the wire can only with difficulty be pulled through.

It was originally expected that the tubing would stand a slight short, and carry the current on to the earth, but experience has shown that a live tube is readily burned through when sufficiently close to any other conductor which will receive an arc. It was also anticipated that renewals and additions would be facilitated by the ready withdrawal of defective wires from the tubing and the substitution of others. We find, however, that owing to the condensation and rust set up inside the tubing the insulation becomes so saturated and swollen that the whole aperture is choked by the wire, necessitating the abandonment of both the defective wire and the tube and the running of an additional tube with the new wire on the surface.

Theoretically the metallic conduit should be the safer system; tubing faultlessly earthed is a perfect method of distributing electric current. By way of emphasising this fact, I may add that a properly earthed tube is so reliable to carry off a leakage of current as to admit of a gas pipe being run in close contact with it; but, when it is possible for the current to get an easier earth by the gas pipe, and the two are separated by sufficient space to admit of a short circuit taking place, or when the space between the two pipes is bridged by a nail or any other metal conductor, an arc is formed and the gas momentarily ignited.

The difficulty we have to consider is almost wholly confined to buildings in which both gas and electricity are installed, and to the danger arising from the adverse circumstances set up when the two are in conflict.

If it were possible to avoid the introduction of gas in the building or adjacent buildings, a leakage on to the tubing need cause the consumer no anxiety beyond the fact that the escaping current was passing through by his meter.

There seems to have been no really valid reason why wood casing as a conduit should have been almost entirely abandoned; perhaps it was in a large measure due to the very slovenly manner in which cheap and badly fitted casing was run, and to the assumption on the part of some people that all wood under any conditions is highly inflammable.

The introduction of the metallic conduit had the appearance of being a neat substitute for wood casing. Being more easily run out of sight, embedded in plaster and being non-inflammable, it promised to be a satisfactory substitute. My own experience has however been that not more than 2 per cent. of fires caused by defective electric circuits have been due to defects developed in wooden conduits.

An answer to this statement may be advanced that the small percentage of fires due to wood casing conduits is due to the equally small percentage of such installations in large centres. In advocating the use of wood casing as against metallic conduits, I am guided by the experience demonstrated by the fact that wooden conduits are perfect non-conductors, that the rubber insulation is better preserved in the wood than in the tubing; there is an entire absence of condensation in the conduit and a "short" from the conduit can only occur by the introduction of a conductor, foreign to the installation, such as nails, screws, &c., being driven through the casing on to the wires.

The trouble caused by wood absorbing water could be largely obviated by coating the casing with shellac varnish; the difficulty caused by the curling up of the edges of the capping would be overcome if the sides of the capping were screwed at the sides instead of in the centre only. A great advantage in favour of wood casing is that the wires are laid in and not pulled through, whereby the insulation is maintained intact, thereby removing one of the most frequent troubles met with in tube conduits. By removing the capping wires are easily get-at-able, facilitating renewals or extensions—an almost impossible operation with the tubes. Short circuiting of wires is avoided if the groove is of sufficient diameter to take the wire only; with neat hard wood casing the space required for conduit runs need not be necessarily thereby increased.

The capping should be checked and so fitted as to almost entirely exclude air spaces, thus retarding the spread of fire from burning insulation after the fuse has blown. When a "short" takes place between two wires in casing, and fires the insulation and the casing, the fire is easily located, whereas in the case of metallic conduits the fault which has caused the arcing on the gas pipe is generally very remote from the point of fusion.

Theoretically wood casing should not receive encouragement; apart from the very clumsy and often slovenly manner in which it was and is usually put on the surface of a well-decorated room, one would imagine that it would form a ready fire conductor. Experience has negatived this latter theory, and proved that from the danger point of view wood casing, though in itself inflammable, is safer than the metallic tubing which, though non-inflammable, forms a ready conductor of electricity and consequently of fire throughout buildings. There is no reason why wood casing should be offensive to the eye; it can be used with very artistic and decorative effect, the capping can be made to harmonise

* A paper read by Mr. Arthur Pordage, Firemaster of Edinburgh, on "Electric Lighting and Fire Risks" at the Fire Brigade Officers' Congress, Guildhall, Westminster, London, on June 16.

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with the other wood fixtures and mouldings, whether of oak, mahogany or other decorative wood. It is a very good non-conductor and preserves the cable insulation as no other conduit system does.

The principal defects due to the wood conduit system are such as can almost always successfully be guarded against; but with this as with all other systems, workmanship forms a most important factor. The mere fact that a highly resinous wood is inflammable does not necessarily imply that all wood is similarly inflammable. A hard wood casing would take some time to get thoroughly well alight, the fire being easily located and above all restricted (the locality of the fault is not communicated by the conduit to several inaccessible parts of a building at the same time); it can be run under or on the side faces of iron or steel girders in such a manner as would spell disaster in the case of metallic conduits.

Wood casing has few supporters amongst electrical engineers and architects, but the increasing use of electricity for light and power, and with it the increasing number of fires caused thereby are sufficient to direct the attention of the advocates of electric lighting to consider the adoption of such methods of distributing the electric energy as will ensure that the best possible and safest means of supplying light to the community are not jeopardised by faulty systems.

Electric lighting and gas heating for domestic purposes are both now so absolutely indispensable to everyday life that the safest means of wiring buildings are essential for the proper safeguarding of life and property against methods which tend to menace alike the success of electric domestic supplies and the buildings in which they are installed.

Of the fire risks caused by electricity, I give the figures for London and Edinburgh during the past three years:—London, total fires caused by electricity, 294. Of this number 279 are returned as being due to defective electric circuits, overheating of electric lamps seven, and the remaining eight to minor causes. For Edinburgh, the total electric fires were forty-six; of this number thirty-five were due to shorting of tubing on to gas pipes, five were due to faulty flexible wires, six to overheating and minor causes.

The averages in other large towns are generally similar, proving that diminution of electric causes of fires, which is so desirable, could only be attained by the adoption of the really safe methods of distributing electric energy in buildings.

The opinions I have experienced may be contrary to the theory advanced by advocates of metallic conduits, but they are those gathered from practical experience and careful observation of facts demonstrated by fires which have been occasioned principally where electricity and gas have been in combination.

The success and popularity of electric installations depends upon the means adopted to distribute the current, which should not be the simplest or the cheapest, but the most effective; and architects might consider the provision in all buildings of channels for running electric mains and conduits. Electric supply has no stronger supporter than the fire service, which would view with alarm any retrograde step in the modern methods of lighting from electricity to the open flame burner.

BRUSSELS INTERNATIONAL EXHIBITION.

IN our issue of last week we were able to show why unusual importance attaches to the British Section of the International Exhibition to be held next year in Brussels, from May to October. Manufacturers have to consider, in regard to it, a totally new situation. Their very reasonable discontent with the character of international exhibitions in general, with the management of former British sections, and with the results of exhibiting, has brought this about. For the first time, what may properly be called a representative national exhibit is to be attempted; and this is being organised on the novel lines we indicated last week.

Exhibitors are no longer to be dependent on a voluntary committee, or left to instal their goods as best they can, or exposed to the risk of being obscurely placed, or required to defray the cost of a general scheme of decoration, or engaged in a speculation the cost of which they cannot ascertain beforehand. The section is in charge of a new department of the Board of Trade, acting in personal touch with them, and taking responsibility for these matters.

French and German exhibitors have long been assisted in systematic ways. Our own were at a disadvantage everywhere, and the result has been harmful to British prestige. But the new organisation undertakes to do more than is done for the exhibitors of any other country. In these circumstances Mr. U. F. Wintour, the British Commissioner-General, is approaching all the staple trades of the country with a view to secure at once that arrangements shall be made for an exhibit showing the scope and real importance of British manufactures.

The Royal Commission, which is presided over by the Prince of Wales, has its offices in Queen Anne's Chambers, Westminster. It is constituted wholly of well-known business men, and the occasion being unique, His Royal Highness is giving active help to the Commissioners.

A departmental inquiry, concluded two years ago, was the means of opening this fresh chapter in the history of international exhibitions. It was presided over by Sir Alfred Bateman. Taking the opinion of a large number of important manufacturers, the committee found a strong and growing prejudice against exhibitions on the old lines, and came to the conclusion that it was largely justified. But, as it would evidently be ruinous for Great Britain to abstain alone from a form of advertisement which is now established, they recommended effective means of meeting the grievances of British exhibitors.

The Exhibitions Department of the Board of Trade, which has been placed under the direction of Mr. Wintour, is the chief outcome. Instead of every exhibition being treated as a new problem of organisation—a problem more or less hastily and badly solved—this department exists as a permanent machinery for the care of British interests in such matters.

One of the most important facilities now offered is that the exhibitor will be in a position to calculate almost to a penny what his venture will cost.

The tariff of charges for space is as follows:—

	Per square foot. s. d.
Including the use of an isolated showcase, or part of a case having more than one frontage . . .	6 0
Including the use of a wall case	4 0
Including the use of a platform and ornamental façade without glass	4 0
Including the use of a platform only	2 6
On wall or screen	2 6
In the Machinery Hall, including the use of platform and hand railing where required	2 6

For motive power the charges are unusually low. The Royal Commission will defray half the charges made for it by the Belgian Administration, on all machinery driven to illustrate processes of manufacture. Thus exhibitors will pay:—

For steam (133 lb. pressure) ½ centime per kilogramme.
For gas 1*s.* 3*d.* per 1,000 feet.
Electricity (2 by 220 volts continuous) 1½*d.* per kilowatt hour.

Water will be supplied free for pumps or condensers. The charge for purer water in the Machinery Hall will be 1*s.* 10½*d.* per 1,000 gallons (50 lb. pressure), and in the Industrial Hall 1*s.* 8*d.* per 1,000 gallons for domestic, and 10*d.* for industrial purposes.

Not only will there be crane power, but the laying of foundations by Belgian contractors will be superintended by a competent engineer employed by the Royal Commission. With the above particulars, the railway and shipping freights, and the contractors' tender, an exhibitor of machinery can make his calculations with a degree of confidence not hitherto possible.

The Belgian State Railways, charging full rates on the outward journey, will return exhibits to their termini free of charge. The British railway companies will make a reduction of 50 per cent. on returned exhibits not sold, and travelling by the same route to the station from which they were sent out. Twelve shipping companies have also agreed to this 50 per cent. reduction.

It will be understood that all preparations begun so far in advance by the exhibitions department are part of the reform which has been described, and that a prompt response to the campaign now being carried on throughout the country is advisable in the interests of exhibitors, as well as of the general scheme.

Art and the "Liberal Arts" are well represented on the Royal Commission, of which the chairman is the Earl of Lytton, and the vice-chairman Sir Swire Smith. Representing pure art there are Sir Edward Poynter, President of the Royal Academy; Mr. Hippolyte Jean Blanc, Royal Scottish Academy; Sir Thomas Drew, President of the Royal Hibernian Academy; and Sir Isidore Spielmann, C.M.G. The Liberal Arts Commissioners are Sir Albert Spicer, Bart.,

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M.P.; Mr. Emery Walker, ex-Master of the Art Workers' Guild; Captain Sir W. de Wiveleslie Abney, K.C.B., R.E., F.R.S., adviser to the Board of Education on matters connected with science, and ex-President of the Royal Photographic Society; Dr. R. Tetley Glazebrook, F.R.S., Director of the National Physical Laboratory.

The Liberal Arts committee include the following co-opted members of the Royal Commission:—Mr. W. Duddell, F.R.S., Dr. C. H. Lees, F.R.S., Major-General J. Waterhouse, Mr. R. Child Bayley, Mr. Robert S. Whipple, Mr. Alfred N. Disney, Mr. Edward H. Rayner, Mr. R. G. K. Lempfert, Mr. J. C. S. Mummery, A.R.I.B.A., Mr. Edward Unwin and Mr. Lewis Evans.

A special committee has been formed to cater for the interests of the trades concerned with buildings, decoration and furniture. Its co-opted members are:—Mr. A. B. Cowtan (Cowtan & Sons), Mr. J. B. Geake (Burnet & Co.), Mr. John H. Gill (Gill & Reigate), Mr. H. Percy E. Harding, Sir Horace Regnart, Mr. W. H. Romaine-Walker, Mr. S. J. Waring, Mr. E. White Wallis, and Mr. H. D. Searles-Wood, F.R.I.B.A. These gentlemen are associated with Mr. C. C. Allom, who was chairman of the decorative arts committee at the Franco-British Exhibition; Mr. L. C. Parkes, M.P., consulting sanitary adviser to the Office of Works; and Mr. G. Cartlich Moore, past President of the North Staffordshire Chamber of Commerce. These three are original commissioners.

SOCIETY OF ENGINEERS.

BY the courtesy of Messrs. Ellington & Woodall, MM.Inst.C.E., engineers to the London Hydraulic Power Company, a number of the members of the Society of Engineers were recently enabled to visit the company's new power station, which is in course of construction at Grosvenor Road, Westminster, about 300 yards west of Vauxhall Bridge.

When completed this building will be the largest of the company's pumping stations, and will replace the existing station at Millbank Street, which has been acquired by the London County Council for the Westminster Improvement. At the time of the visit the works were not in a sufficiently advanced state for the reception of the machinery, and interest centred principally in the ferro-concrete construction (Hennebique system), details of which follow.

Reservoir.—This is arranged in six compartments, each about 100 feet long, 38 feet wide, and 16 feet deep, the top water level being the level of the highest known tides. The vertical walls are all 12 inches thick at the bottom, tapering to 8 inches thick at the top, and spread out in the form of a T flange 3 feet wide, the flanges forming flat surfaces which are being utilised as gangways. The construction is so designed that the vertical walls are strong enough to resist the water pressure, when each or all the compartments are full, without external support of any kind.

Roadway.—The roadway is about 260 feet long, having an average width of 17 feet, and is carried along its length between vertical walls 17 feet apart. Underneath are the pipe subways. The ferro-concrete beams and floor forming the roadway are designed to carry a moving load of 16 tons on two axles, in addition to a super load of 1 cwt. per square foot.

Filter Floor.—This is carried by the walls of a building 89 feet long and 52 feet wide, having a central longitudinal beam supported by three columns, all the beams and columns being of ferro-concrete. The filter plant weighs 800 tons, which, with a super load of 150 lb. per square foot, brings the total weight to be carried by this floor to 1,100 tons. The three ferro-concrete columns are 22 inches square, and support other columns carrying the overhead water tank, the total load on each column being 310 tons.

The *coal store floor* is designed to carry a load of 7 cwt. per square foot, and covers the same area as the filter floor; the central portion is carried on the ground, and at each side the floor spans the coal conveyor trenches through which coal is carried to the boilers.

The *boiler blow-off tank* is a covered tank about 8 feet deep. The length is 36 feet, the width varies from 12 feet 6 inches at one end to 5 feet at the other end.

The *drains tank* is a small covered tank 9 feet long by 6 feet wide and 4 feet 6 inches deep.

These two tanks are below the level of the general drainage, and hydraulic ejectors will be used for pumping the water into the drains.

The buildings when completed will comprise engine and boiler houses, accumulator tower, chimney shaft, coal store, filter house, workshop, store room, men's room, and foreman's house, with water tanks over the boiler house and filter house. The settling reservoirs in the rear cover an area of 2,550 square yards, with a total capacity of about 2¼ million gallons. The wharf on which the coal handling apparatus, &c., will be erected, has a river frontage of 100 feet, subways under Grosvenor Road connecting the two sites. The station is designed to supply 200,000 gallons of power water per hour, at a pressure of 800 lb. per square inch. River water is to be conducted into the settling reservoirs at the rear through two lines of 20-inch pipes, laid at about half-tide level. The reservoirs can be emptied to the river at low tide through 14-inch drains. The water after settling is to be pumped from these reservoirs through the condensers into an overhead tank above the filter floor, is then filtered, and from the filters will flow into another tank, at a lower level, over the boiler house, from whence it will be conducted to the main engines with a gravity head, and pumped into the power mains.

There are at present about 165 miles of hydraulic power mains laid in London, and served by five central stations from two to three miles apart. The supply is over 20,000,000 gallons per week, with about 6,000 machines at work.

THE ELECTROLYTIC THEORY OF THE CORROSION OF IRON.*

THE Iron and Steel Institute has endorsed the economical importance of the general subject of the corrosion of iron by granting a Carnegie Research Scholarship for an investigation of this important problem. The holder of this scholarship, Dr. J. Newton Friend, in reporting the results of his work, dwelt entirely upon certain experiments which he had carried on and which he interpreted as a support of what has been called the carbonic acid theory of corrosion. At the same time the results of these experiments were considered totally to disprove the electrolytic theory of corrosion, and especially the work of the author of the present paper and that of his associates in support of this theory.

The author wishes to lay before the Institute as briefly as possible, firstly, the fundamental conceptions involved in the modern electrolytic theory of the corrosion of iron; secondly, to develop this theory from the facts now known, and to show that the older carbonic acid theory advocated by Dr. Friend can be, and is, included therein; and, thirdly, to point out some of the practical applications of this theory to the problem of corrosion as met with in engineering practice and daily life.

Ions and the Electrolytic Dissociation Theory.

In order to explain certain important and well-established facts, such, for example, as the electrical conductivity of salts dissolved in water, the abnormal lowering of the freezing point and the raising of the boiling point of water by the presence of dissolved salts, abnormal osmotic pressure, &c., there has been proposed and almost universally accepted what is known as the electrolytic dissociation theory. In accordance therewith, when a salt dissolves in water, a certain proportion of the dissolved molecules are regarded as dissociated or broken up by the water into component parts called ions. These ions act in the phenomena just mentioned, and in many others, just as whole molecules do. These parts of molecules may be made up of a single atom, or a group of atoms, but as individuals differ from real atoms in that they carry relatively large charges of electricity. This common salt-in-water solution furnishes two ions—the sodium ion carrying a positive electrical charge, and the chlorine iron carrying an equivalent negative charge. Water itself is somewhat dissociated into two ions oppositely charged—the positive hydrogen ion composed of one atom of hydrogen, and the negative hydroxyl ion composed of one atom each of oxygen and hydrogen.

Electrolytic Solution Pressure.

Every metal when placed in water, or under such conditions that a film of water may condense upon it, tends to dissolve in the water, or, in other words, to pass from its atomic or metallic condition into its ionic condition. This escaping tendency of the metals varies from that shown by sodium or potassium which is so great as to cause instant and rapid decomposition of the metal and water, to gold or platinum, where such tendency to dissolve is zero. Between these two extremes we find the other common metals,

* From a paper presented to the Iron and Steel Institute by William H. Walker, Boston, U.S.A.

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including thereunder the element hydrogen, which may be considered as a metal. As the atom of metal passes into the water, it assumes a positive charge of electricity, leaving the metallic mass from which it separated charged negatively; this property or escaping tendency of the metal is termed its solution pressure. It is obvious, however, that this action can continue for only a short time; owing to the fact that the mass of metal and solution are of opposite polarity, the electrolytic tension becomes so great that no more atoms can escape to the ionic state, and the solvent action ceases. This condition was first described by Helmholtz, and called by him an electrolytic double layer. If now there be in the water ions of another metal which has a smaller solution pressure than the one under consideration, the action as above described will be reversed and the ion with the less solution pressure will pass back to the metallic state, plating out on the first metal and giving up its charge of electricity. At this point the first metal will be charged positively, and the solution in the immediate vicinity negative, and there will tend to be set up a second electrolytic double layer opposite in polarity to the first. The result is, a current of electricity flows from the metal to the solution at the point where the metal passes into solution, through the solution to the metal at the point where the ions of the second metal are plating out, and back through the first metal to the starting point again. The electrolytic double layers are thus destroyed, an electric current passes, and the solvent action of the water on the first metal continues.

This phenomenon and its relation to the corrosion of iron are clearly exemplified in the well-known Daniel or gravity cell.

In the case of pure iron in water a perfectly analogous condition is found to exist. Water itself is dissociated to a small but perfectly definite extent into its ions, hydrogen (H) and hydroxyl (OH). When a strip of pure iron comes into contact with water, it sends into the water iron atoms in the form of positively charged ions. Hydrogen as a metal has a much smaller solution pressure than iron, and hence an equivalent number of hydrogen ions plate out on the iron strip (leaving the free hydroxyl ions with their negative charges to balance the iron ions with their positive charges), and an electric current flows from the iron by means of the iron ions to the solution, and by means of the hydrogens from the solution back to the iron again, thus completing the circuit. But here comes an important break in the analogy of the film of copper in the Daniel cell. Deposited copper is a good conductor of the current, and offers no resistance to its flow from the solution to the iron on which it is attached. The reverse is true of the deposited hydrogen; here we have a high insulator—a film of gas which offers a great resistance to the flow of the current. Hence, although in the case of the iron strip in water all the conditions for continuous solution are present, owing to the resistance offered by the deposited hydrogen film (called polarisation) the action must cease.

Just as in the case of iron in a copper sulphate solution the rapidity of the action depended upon the number of copper ions present in the solution, so here the solution of the iron in the first instance depends upon the number of the hydrogen ions present. This number of hydrogen ions, or the concentration of these ions, is increased by the addition of any acid. So weak an acid as carbonic increases the number, but to a relatively small amount; while a strong acid, like hydrochloric or sulphuric, adds to the number to such an extent that the solvent action becomes violent, and the deposited hydrogen comes off as a stream of gas.

It is this aspect that Dr. Friend has ignored, and he has made some statements in this connection which, if taken seriously, can but prove a stumbling block to the progress of the study of corrosion. He gives experimental data, from which he concludes that, when pure iron is placed in water free from oxygen and carbonic acid, no iron is dissolved, because, under such circumstances, no iron was detected by him directly by the ordinary test for iron ions, namely, potassium sulphocyanate. But, on the other hand, he finds that, when the minute amount of carbonic acid which naturally adheres to the iron and to the sides of the containing vessel is present, iron will dissolve, and under these conditions can be later precipitated by oxygen as rust. Upon these observations he throws out the entire electrolytic theory of corrosion, and states, "We thus see that the electrolytic theory of corrosion is untenable."

Even though the entire accuracy of the experimental work just noted be granted, the fact remains that these data in no way contradict the electrolytic theory, but in reality they confirm it.

Dr. Friend did not detect the iron ions in the water in which his iron strip had stood, simply because his analytical methods were not sufficiently refined. As the author has shown, owing to the formation of the polarising film of hydrogen, the amount of iron in solution must of necessity be very small; but by using the excessively delicate method for determining dissolved iron devised by Stokes,* the amount of iron which has passed into solution can be accurately determined. As has been seen, the only effect which carbonic acid can have upon the solution of iron in water is that of any acid, namely, to increase the concentration of the hydrogen ions. This it surely does; and if Dr. Friend's observation be correct, which the author does not admit, namely, that this small amount of carbonic acid is necessary to the solution of the iron, this fact does not contradict the electrolytic theory, but can best be explained, and in truth can be explained only, by the use of the electrolytic theory.

It happens that there exists a very delicate test for the presence of the iron ion in the fact that potassium ferricyanide solution immediately forms therewith a bright blue colour; while, on the other hand, there is an organic substance known as phenolphthalien which becomes intensely red in the presence of hydroxyl ions. If, therefore, a piece of iron be placed in an aqueous solution containing potassium ferricyanide and phenolphthalien, which, to prevent convection currents, has been thickened with a little ordinary gelatine, there should be formed a bright blue colour at those points on the iron bar at which the iron is passing into solution, and a bright red colour on those portions on which the hydrogen is plating out, leaving in the solution at those places an equivalent number of hydroxyl ions.

(To be concluded.)

COMPETITION RESULTS.

IN the competition for a new library at Liscard, Cheshire, which was limited to architects practising in Lancashire and Cheshire, the Assessor, Mr. G. H. Willoughby, F.R.I.B.A., has awarded as follows:—

Premier design.—No. 34, by Messrs. R. B. MacColl and G. E. Tongo, Southport.

Bracketed second.—No. 8, by Mr. J. R. Earnshaw, Manchester; No. 30, by Messrs. Packer, Drewitt & Drewitt, Southport; No. 33, by Messrs. Appleyard & Quiggin, Liverpool; No. 41, by Messrs. Deacon & Horsburgh, Liverpool; No. 49, by Messrs. Sproat & Warwick, Liverpool.

Honourable mention.—No. 4, by Messrs. Cheers & Smith, Blackburn; No. 6, by Messrs. Potter & Langham, Manchester; No. 17, by Mr. Frank Rimmington, Liverpool; No. 35, by Messrs. Hobbs & Simon, Liverpool; No. 39, by Mr. C. T. Taylor, Oldham; No. 43, by Messrs. Briggs, Wolstenholme & Thornely, Liverpool.

The Libraries Committee at their meeting on Tuesday decided to proceed with the premier design, but this decision does not bind them to erect a building according to the selected or any other design.

The award of the assessor, Mr. H. T. Buckland, architect to the Birmingham education committee, in the competition for designs for the proposed school in Grove Street, Barnsley, is as follows:—1st, No. 28, 30*l.*; 2nd, No. 37, 20*l.*; 3rd, No. 21, 10*l.*; 4th, No. 31, no prize. On opening the sealed envelopes disclosing the identity of the competitors, it was found that the following were the names of those successful:—1st, Mr. E. W. Dyson, Barnsley; 2nd, Messrs. Clarke & Moscrop, Darlington; 3rd, Messrs. Holtom & Fox, Dewsbury; 4th, Mr. A. Brocklehurst, Manchester.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *Architectural Review* (Boston) devotes the greater part of its illustrations to the Hanna Mausoleum, a costly structure after the fashion of a Greek Doric temple, with the exception that it is in plan Ionic tetrastyle amphiprostyle. It is a little curious to note these inconsistencies in an otherwise attempt to follow strict Greek precedent, for in the same number we have a view of the Entrance to the Field Memorial Library, Conn., Mass., which is distyle-in-antis with pure Ionic detail.

Dekorative Kunst has an appreciation of the work of Maximilian Dasio with particular reference to his designs for medals, but including also an account of his decorative design and drawing in other directions. There is also a

* *Journal of the American Chemical Society*, 1907, p. 451.

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description of a modern brick house at Crefeld, of which Herr August Biebricher is the architect.

Deutsche Bauzeitung illustrates a remarkably successful design for the residence of Herr Adolf Dietler in Freiburg im Breisgau, of which Rudolf Schmid is the architect, and in which Greek detail is employed with quite refreshing modernism.

NOTES ON BOOKS.

"The Architecture of the Renaissance in Italy." By (the late) William J. Anderson. Fourth edition. (London: B. T. Batsford. 12*s*. 6*d*. net.)

THE fourth edition of this standard work has been edited by Mr. Arthur Stratton, and in the process has lost nothing of the value of the original, but is more excellent than ever. The mere fact that there are now seventy collotype and other plates and 110 illustrations in the text, as compared with the fifty-four collotype and other plates, and seventy-four smaller illustrations in the text of the first edition, is sufficient to show that much has been added. A comparison of the new additions shows that these have been wisely selected, and that their value is unquestionable, seeing that several are from measured drawings and sketches of Mr. Leslie Wilkinson. One may perhaps differ from the original author's views on some points, but cannot fail to recognise the high service he has rendered to the thoughtful student of the Renaissance architecture of Italy, a service that must render his work for a long while to come a classic in the literature of architecture.

"The Directory of Contractors and Public Works Annual, 1909." Edited by M. Sharpe. (London: *The Contractors' Chronicle*. 15*s*.)

This annual directory maintains its position of usefulness not only by the completeness and careful classification of contractors under the headings of the various classes of work they undertake, but by its lists of those with whom contractors have to deal in an official capacity, town clerks, municipal and district council engineers and surveyors, architects civil and naval, shipbuilders, the great public bodies of London. Further valuable information is contained in full reports of important legal cases concerning contractors, Bills in Parliament for the present Session, works in construction and works contemplated, so that this Directory becomes indispensable for all who are interested in contracts.

"Devon Church Antiquities." By John Stabb. (London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd. 6*s*. net.)

This book is, as it were, a supplement to the same author's work on "Some Old Devon Churches," and gives details of many of the accessories that in the former volume were, for want of space, mentioned but not illustrated. It deals, therefore, more particularly with the distinctive features of the fitment of Devon churches, fonts, pulpits, screens and benches, the objects that preserve the evidences of the West-country skill in craftsmanship. There is an especial character about much of the carving in Devon, which, although to a slight extent shared by the work in Somerset, is nowhere to be found in England as in the West country, and proves that the men of Devon were ever hard hitters, whether they were carving oak or Spaniards. In the carving of the fifteenth century Devon craftsmen there is no hesitation, no tentative cutting away by gentle stages to the final form, but a bold and vigorous smashing into his material. The Devonian was, in fact, the Michel Angelo of wood carvers. It naturally results from this peculiar technique that the carved woodwork in Devon to some extent lacks delicacy and refinement, and is on occasion even coarse. And yet we do find sometimes that refined work was possible and produced in Devon, more often perhaps in stone than in wood; but such instances as Dunchideock and Harberton, for example, show skill in minutely delicate woodwork, equal to that of a German craftsman. Although there are examples remaining of painted decoration on the screens of Devon churches, they are not to be compared either in number or in execution with those of Norfolk and Suffolk. Carving in the West country, colour in East Anglia are the dominant excellences. Mr. Stabb has with a thoroughness that is born of love for his subject brought before us a characteristic collection of the beauties of Devonian craftsmanship of all periods from the eleventh to the eighteenth century that must attract visitors to his county, not the less that he is careful to tell us how we can get to many out-of-the-way churches containing practically unknown examples of artistic work.

"The Arts Connected with Building." Lectures on Craftsmanship and Design delivered at Carpenters' Hall, London Wall, for the Worshipful Company of Carpenters. By R. W. Schultz, C. F. A. Voysey, E. Guy Dawber, Laurence A. Turner, F. W. Troup, A. Romney Green, M. H. Baillie Scott, Chas. Spooner, and J. Starkie Gardner. Edited by T. Raffles Davison. (London: B. T. Batsford. 5*s*. net.)

The excellence of the lectures delivered each winter under the auspices of the Worshipful Company of Carpenters fully justifies their preservation in a more permanent and convenient form than the columns of a newspaper, and thus preserved it becomes possible to read again and again, till the lessons inculcated have been assimilated, such thoughtful and thought-inducing papers as that by Mr. Voysey on "Ideas in Things." We regret, however, to notice that the illustrations to the papers by Mr. Baillie Scott and Mr. Charles Spooner are wholly from their own designs. It not only savours of vanity to pursue such a course, but looks perilously like the blatant self-advertisement of a tradesman. It would have been excusable if all the lectures at Carpenters' Hall had dealt with woodwork; it is refreshing, therefore, to find that the art to be found in the craft of the plasterer, the leadworker, and the smith has also been included in the subjects on which lecturers have discoursed.

"Annals of Archæology and Anthropology," issued by the Institute of Archæology. Edited by J. L. Myres. Vol. I., Part 4. (Liverpool, at the University Press; London, Archibald Constable & Co. 2*s*. 6*d*.)

The contents of this part of Volume I. of the Annals contains a preliminary report on "Excavations at Sakje-Geuzi in North Syria," by John Garstang, and papers on "Early Civilisation in Northern Greece," by A. J. B. Wace, J. P. Droop, and M. S. Thompson. Professor Garstang's report includes as its most interesting matter, to ourselves at any rate, an account of the remarkable Hittite sculptures forming part of the architectural treatment of the portico of the Temple Palace that is still awaiting further excavation before the plan and nature of the building can be elucidated. Though these sculptures are obviously related to Assyrian art they nevertheless have local traits that stamp them as provincial work, and in the opinion of Professor Sayce are the work of the Hittites of North Syria, dating between the campaigns of Assur-nazir-pal in B.C. 880 and the conquests of Tiglath-Pileser III. about 730 B.C. The chief result of the excavations in Northern Greece seems to be that Almyro in Southern Thessaly can no longer be supposed to be the site of Itonos and the Temple of Athena Itonia. Further investigations are still needed to determine the relationship of the early civilisations of Northern Greece, though it would appear that there the neolithic age lasted till late Mycenean times.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Middlesbrough Library Competition.

SIR,—At the suggestion of certain architects the memorial and letter in reference to the above competition was sent to the competitions committee of the Institute, at the same time expressing the hope that they would take up the matter strongly, and to which they replied as follows:—

"The competitions committee have considered the objections to the assessor's award raised in your memorial to the Middlesbrough Council.

"It appears that the most serious objections to the award in your views are (1) the position of the lending library; (2) the area devoted to patents library, &c. The other objections do not appear to be of any great importance.

"With regard to the first the committee is of opinion that the clause in the instructions defining the position of the lending library is somewhat ambiguous, but it does not seem

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to necessitate its actually abutting on the dwelling-houses. The suggestion is that it should be on that part of the block of land adjoining the dwelling-houses.

"Your second objection as to the area of the patents library seems to be due to a misapprehension of the schedule of accommodation given in the instructions. The 1,739 feet required includes corridors, lavatories, &c.

"An examination of the successful plan will show that the door from the news room to the entrance hall is a private pass door, and not for the use of the public.

"The Competitions Committee consider that when an assessor has been regularly appointed it would be well to bring any objection to the award before them in preference to approaching the promoters directly."

To which we replied disagreeing with their interpretation of the conditions, and laid the whole of the correspondence before the President of the R.I.B.A., at the same time sending a copy of same to the *Architect*, *British Architect*, *Builder*, *Building News* and *Builders' Journal*, all of whom published it in last week's issue, with the exception of the *Builder*, which had an article in support of the protest.

The President's reply, per the secretary R.I.B.A., was as follows:—

"The President of the Royal Institute of British Architects desires me to thank you for your letter. He has very carefully considered the terms of the protest which you have sent to him, together with the conditions and the successful design, and he has come to the conclusion that the decision arrived at by the Competitions Committee of the Royal Institute is a sound one."

We have replied as follows:—

"We have to acknowledge your letter of the 26th inst., but would point out that you appear to have misunderstood our intention in forwarding you the protest in question.

"This was sent to you, as head of the Institute, with the object of having the matter thoroughly investigated by the Council of the Royal Institute, and not by you personally (see clauses 3 and 4 in our letter), and we shall be obliged if you will be good enough to bring the matter before your Council at the earliest moment."—Yours faithfully,

HOSKINS & BROWN, Court Chambers, Darlington.
KITCHING & LEE, Houndgate Chambers, Darlington.
W. H. BOURNE, A.R.I.B.A., Houndgate Chambers, Darlington.

June 29, 1909.

Patriotism.

SIR,—I have to-day heard that the order for the granite for the premises of the New Automobile Club is likely to be sent to Norway; if so, Mr. Editor, may I suggest that this is monstrously unfair? Our Cornish granite is quite as good as this foreign, or any other foreign granite, quite as reasonable in price, can just as readily be supplied, and would give employment to our own countrymen. I want to enter a strong protest against the employment of foreign firms in preference to our own countrymen, and I do most sincerely hope that the architects will reconsider their decision (if it has been made), and give the Britisher a chance. As you are well aware, I am in no way connected with the granite industry, my interest is purely British, and whether I may be dubbed a tariff reformer or protectionist matters now't to —Yours truly, BRITISHER.

London: July 1, 1909.

Influence of Material.

SIR,—May I have the indulgence of a few lines after a renewed perusal of Mr. G. S. Aitken's paper in your issue of 18th inst.?

It is always a pity, when analysing admittedly good architecture, to be led away by fantastic imaginings. "Yonder phantom only flies, to lure thee to thy doom;" so wrote Goldsmith, and his lines would forcibly apply to the theory of the employment of arithmetical and geometrical proportion in the design of buildings. The "rule of three" referred to by Mr. Aitken is condemned out of his own mouth.

And his diagram of the Parthenon moves one to laughter. Does he really think that the Athenians—artists to the core—were dependent upon such a medley of triangles to obtain a well-proportioned façade? The theory of scientific, as contrasted with artistic, proportion would of course be worthy respectful consideration if Athenian buildings in general conformed (*accurately*, not loosely) to the tyrannous sway of angles and numbers. But there are insufficient examples extant; and if other Grecian buildings are analysed, other proportions are found, and yet the buildings are fine. To my mind, too, it is unsportsmanlike to juggle with base lines and apex lines for setting out triangulations, such as is customarily done by the school of scientific proportionists.

Another matter worthy Mr. Aitken's consideration is that the influence of material was a much more potent factor on architectural design than the influence of Nature; but I suppose he subscribes to Pope's false sentiment that:—

"All Nature is but Art unknown to thee;
All Chance, Direction that thou canst not see;
All Discord, Harmony not understood;
All partial Evil, Universal Good."

—Faithfully yours, PERCY L. MARKS.

Coal Smoke Nuisance.

SIR,—I have read with interest the article on the above subject appearing in your issue of the 18th inst. The use of gas stoves, both for heating and cooking, is undoubtedly having a marked effect upon the condition of the air in London, but we are still a long way behind Paris and other Continental cities. It will be found on investigation that the purity of the air in Paris is not entirely due to the use of gas stoves or electric radiators, but to the very large number of anthracite stoves which are so popular in that city, and it is not to be wondered at. In Paris the Welsh anthracite coal, on which an import tax has to be paid, costs the public there about 25 per cent. more than it does in London; yet it has been proved conclusively in that city that by means of anthracite stoves the rooms of a house can be much more economically heated than by gas, steam, hot water or electricity.

The initial cost of fixing an anthracite stove is not more than the initial cost of fixing a gas stove, and, no matter how cheap the gas may be produced by municipal authorities or gas companies, it will never be possible to heat a room 12 feet by 17 feet by 9 feet with a gas stove at a cost of 1*s.* 6*d.* per week, but it is possible to do so with an anthracite stove of the continuous burning type.

Half the householders in London imagine that anthracite is some patent fuel, and have no idea that coal-pit owners in this country are sending more than half what is mined from their pits to France and Germany in order that the houses in their great cities may be cheaply warmed and that the air may be purer than in London.—Yours faithfully, WM. CLARK.

23 Courthope Villas, Wimbledon:
June 24, 1909.

GENERAL.

Mr. Frederick Bligh Bond, F.R.I.B.A., director of the excavations at Glastonbury Abbey, has been elected diocesan architect for Bath and Wells. The other candidates were Mr. W. D. Caröe, architect to the Ecclesiastical Commissioners, and Mr. C. E. Ponting, one of the diocesan surveyors for Salisbury.

The Governors of the Watford Grammar School are putting up the plans of the new buildings in Cassiobury Park for competition among certain selected architects.

The Royal Society of Arts have awarded the Society's silver medal to the following readers of papers during the session, 1908-9:—Mr. Henry C. Brewer, "Gothic Art in Spain;" Mr. George Hubbard, "Dew-ponds;" Mr. Percy A. Wells, "English Furniture Design and Construction;" Mr. Arthur Anthony Macdonell (Boden Professor of Sanskrit, Oxford), "The Buddhist and Hindu Architecture of India;" Mr. Cecil L. Burns (Principal, Bombay School of Art), "The Functions of Schools of Art in India."

The Executive Committee of Selby Abbey restoration scheme met recently in the sacristry of the abbey. A lengthy discussion ensued with reference to certain work which it is absolutely necessary should be done to the abbey before the restoration could be completed in October, and it was decided to appeal for a sum of 1,000*l.* to carry on the necessary undertaking. The additional sum required is due to the fact that as the restoration work proceeded many defects had been revealed and weaknesses of the fabric observed that required speedy attention. It was announced that the total funds at present stood at 39,700*l.* 3*s.* 2*d.* The great east window of Selby Abbey, which was much damaged in the fire of three years ago, has now reached Selby from the restorers fully repaired, and is being placed in position by Messrs. Ward & Hughes, of London.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, July 10.

Manchester Society of Architects. Visit to "Heathcote," Ilkley, Mr. E. L. Lutyens, architect. St. Margaret's Church, Mr. R. Norman Shaw, R.A., architect, and to Bolton Abbey.

Monday, July 12.

British Archæological Association. Sixty-sixth annual congress, July 12 to July 17. Headquarters at the Royal Hotel, Norwich.

Royal Society of Antiquaries of Ireland. Summer meeting for the province of Munster, July 12 to July 16. Headquarters at Clonmel.

Somersetshire Archæological Society. Sixty-first annual meeting. Headquarters at Wells.

Tuesday, July 13.

Manchester Society of Architects. Visit to Owens College. New Buildings—Students' Union, Messrs. Beaumont & Capper, architects; Engineering Laboratory, Professor Capper, architect; Gymnasium, Professor Capper and Mr. J. L. Grant, architect.

Wednesday, July 14.

Northern Architectural Association. Excursion to Selby and neighbourhood.

Town Planning and Housing Exhibition at the Hampstead Garden Suburb, July 14 to August 7.

Friday, July 16.

Architectural Association. Exhibition of work done in the School of Architecture and award of prizes. 3 P.M. to 6.30 P.M.

ARCHITECTURE AT THE ROYAL ACADEMY.

COMING now to the section of the exhibition devoted to buildings of a public and more or less municipal character we have in the "Design for New Post Office, Pretoria, S.A.," by Messrs. G. G. LEITH & W. LOUW, a striking design suggestive of a combination of old German and Modern Renaissance, piquancy is given to which by the joint use of gables and open loggia on the top storey. Messrs. SILCOCK & REAY show the perspective of their "First Premiated Design: Cornwall County Council Offices," but not their plan, which it was that won them the competition. Messrs. BAKER & MASEY'S design for "Rhodes Memorial, Cape Colony," is a Greek Doric Valhalla approached by a series of flights of steps with WATTS'S great statue of "Vital Energy" and the background of the Matoppo hills—altogether a very impressive composition.

"The New Wellesley Place Approach to Government House, Calcutta," by Mr. JAMES RANSOME, is a stately scenic arrangement of buildings symmetrically disposed on either side of the avenue, great depth of effect being obtained by the use of detached columns and arcades forming shady verandahs to the main walls of the buildings. The "New Wing, London Homœopathic Hospital," by Mr. EDWIN T. HALL, is quite of municipal character and with projecting pavilions and recessed centres turns an utilitarian type of building into a decent piece of architecture. "Glamorgan County Offices, Cardiff," by Mr. ROBERT ATKINSON, is a fine piece of detail design of Franco-Greek type beautifully drawn. Of similar excellence both in design and draughtsmanship, though of a different character, is the "Detail of Design for Glamorgan County Hall," by Messrs. S. B. RUSSELL & EDWIN COOPER. "Nos. 398 to 422 Oxford Street," by Mr. R. FRANK ATKINSON, illustrates SELFRIDGE'S Store.

Several of the competition designs for the new London County Hall are exhibited on the Academy walls, though it is now some little time since the competition was decided. The design by Mr. C. STANLEY PEACH is, as far as exterior goes, for no plan is shown, an excellent one, with a dome, and therefore too costly to compete with the selected design. Mr. WILLIAM HAYWOOD'S design is an example of dignified common sense. Mr. BERTRAM LISLE'S "Design for a Town Hall and Municipal Building" is student's work, but distinctly good. "A Design for Glamorgan County Offices," by Messrs. E. GARRATT & H. W. SIMISTER, is well composed, with a colonnade in the centre and free from extravagance. Mr. PAUL WATERHOUSE'S "Prudential Assurance Company Offices, Aberdeen," is a scholarly and refined design shown in an excellent perspective in Indian-ink wash. "Mission Hospital at Hebron, Palestine," by Messrs. CLAUDE KELLY & A. DICKIE, is an impressive composition to which a distinctive Eastern character has been imparted.

The design for "New Premises, London and County Bank, King's Road, Chelsea," by Mr. REGINALD T. BLOMFIELD, A.R.A., introduces an interesting variant on ordinary methods of design, this being virtually a stone building with red brick pilasters; the effect is, at any rate in the drawing, distinctly successful. The "Central Entrance, Hull Town Hall," by Messrs. S. B. RUSSELL & E. COOPER," is shown by a big coloured drawing, in which the detail is clear. It strikes us that the actual doorway appears small, and looks as if it were an accident in the design. Messrs. H. V. ASHLEY & WINTON NEWMAN show their design for "Birmingham Council House Extension" in a practical and workmanlike coloured elevation. Messrs. COLLCUTT & HAMP'S "Competition Design for Cardiff County Offices" is rather too pretty and not sufficiently dignified for its purpose or its position. "Proposed Street Bridge and Towers," by Mr. JAMES A. SWAN, looks like part of a design for the extension of the Birmingham Council House in which the street bridge was an essential; the composition forms an effective entrance to the street, but how the tower that completes the scheme would be balanced at the other end of the Council House Extension we are not shown.

"Town Hall, Chelsea: New Front to King's Road," by Mr. LEONARD STOKES, is a detail drawing of quiet and dignified work. "Cardiff County Hall: Detail of Front," by Mr. ALFRED W. S. CROSS, is another of the competition designs for Glamorgan County Offices, and rather too florid an example of detail. Messrs. WARWICK & HALL'S "Competition Design for Glamorgan County Hall: Detail," is yet one more from the same competition and an excellent example of good detail with some finely conceived large-size seated figures that form an integral portion of the design. A quaint conceit is the use of dolphins as supporters to balconies. Mr. FREDERICK J. LUCAS'S "Design for the Façade to a Club in Ferro-concrete" is a perspective drawing of the design that obtained first prize in the competition recently promoted by the *Builder*, and, being coloured, shows better than the original drawing in black-and-white the author's scheme of decorative use of material. Mr. A. GILBERT SCOTT'S "Design for Glamorgan County Hall" is a remarkable work in its external dignified and original composition. The plan is not shown. Mr. ROBERT ATKINSON'S "Cornwall County Offices, Truro," is another perspective of a competition design, which, though excellent in its grouping, may or may not have been accompanied by a good plan. These competition designs, without plans in which the essence of the competition con-

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sisted, are merely academic studies of exteriors. The "Young Men's Christian Association, Manchester," by Messrs. WOODHOUSE, CORBETT & DEAN, is a curious design for that city, inasmuch as, from the coloured perspective, it appears that one principal element is the delicate combination of green stone in ground floor and bands with cream-coloured mass, perhaps, though the building is intended to be carried out in faïence.

NOTES AND COMMENTS.

THE danger of fire to St. Paul's Cathedral, to which we drew attention in our article on "The Fire Risks of London's Public Buildings" in our issue of February 12 last, has now received the careful attention of the Dean and Chapter, and they have decided on a scheme of high-pressure fire service prepared by Mr. MERVYN MACARTNEY to supplement the power that the fire brigade could bring to bear for the extinguishing of a fire at St. Paul's Cathedral. The cost of the fire-preventive measures proposed is estimated at 5,000*l.*, which is a moderate enough amount to pay as a capital expenditure to ensure the safety of London's civic cathedral. Appeal has been made by the Dean and Chapter to the Corporation and City Companies for assistance in carrying out this work and urgent repairs, and the matter has been referred to the Corn, Coal, and Finance Committee of the Corporation for consideration.

THE meeting of the Archæological and Architectural Society of Northumberland and Durham, which, as noted in our column of "Forthcoming Events," took place this week, embraced visits to places of considerable interest, as Lincluden Abbey, near Dumfries, formerly a Benedictine house, and of which there remain the choir, south transept, part of the nave, and some of the monastic buildings, as well as the fine tomb of the wife of the founder, daughter of King ROBERT III. Caerlaverock Castle, with its moat intact and full of water, is unique in Scotland. The house of Kirkconnell is a good example of a Border keep. Sweetheart Abbey, founded in 1284 by Lady DEVORGILLA OF GALLOWAY, wife of JOHN BALLIOL, to receive the embalmed heart of her lord, is one of the finest and best preserved of the monastic churches of Scotland.

IT is well to find an intelligent and wakeful public interest in the beauties of their respective localities manifested by the inhabitants, and we are therefore in sympathy with the protest of the residents of Southampton against the proposed or suggested erection of buildings on the western shore, which is one of the features of the town that go to make up for much of the ugliness inseparable apparently from a busy port and dockyard. Unfortunately, a little heat has been created by a reference of the protestants to an assurance believed by them to have been given by the Corporation to the Board of Trade, but denied by the Town Clerk.

LOCAL museums are undoubtedly worthy of encouragement, and in regard to these the advice given by Sir CHARLES HOLROYD in opening the new Weybridge Museum should be earnestly weighed and borne in mind by all who have in any degree to do with such museums. Commencing his argument from the proposition that all the most successful and vital museums are so by reason that they are distinctive and in some direction or other different from all other museums, he urged that a local museum should above all things be local; in this case it should illustrate Weybridge. This is sound advice, and if followed will preserve the local museum from being the dusty repository of a heterogeneous and incomplete collection of South Sea curiosities brought home by local sailor boys, useless for study or information, and occupying space that should be devoted to more suitable exhibits. One of the most difficult things for the managers of a local museum to learn is that they must be prepared to refuse offers of gifts from their local friends and not accept everything that is given. Better for the time empty cases and cupboards than unsuitable rubbish.

CLIENTS sometimes object to the high fees charged by professional men for valuations, and seem to think that all they should pay for is the bare value of the time spent by the surveyor in making his valuation. This, however, is not all that is paid for; there is also the risk of loss by reason of a mistaken idea of the value of the property in question. This has just been forcibly illustrated by the result of the action of CALLARD *v.* MAY and another.

IN this case Mr. ERNEST CALLARD, managing director of Messrs. CALLARD, STEWART & WATT, brought an action to recover damages from Messrs. STANLEY MAY & ARTHUR ROGER ROWDEN, auctioneers and surveyors, for negligence in advice given by them respecting the acquiring of certain property in Oxford Street. The result of the action was that Messrs. MAY & ROWDEN were mulcted in damages of 1,000*l.* and costs. It cannot be too widely known, especially by younger members of the architectural profession, that they incur a serious responsibility every time they make a valuation of property, and are liable to a claim for damages should the advice they give cause loss to their clients. They should therefore be chary of taking up such work at apparently remunerative fees below the usual scale, which is intended rightly to recompense professional valuers for the great responsibility they undertake.

THE question of Norwegian and British granite has again come up in the House of Commons, and seems now by reason of the action of the present Government to have become a party question, so that we have a member for Aberdeenshire, who is a Liberal, speaking in defence of the Government policy of using Norwegian granite to the detriment of his own constituents. It was stated in the House of Commons that the price of Norwegian granite for Rosyth Dock was 65,000*l.* as against 94,000*l.* for British, admittedly a serious difference.

THE tableaux organised by the Professors of Greek and of Archæology for the Hogarth Fair at University College, London, were not only archæologically correct, but really artistic productions, as indeed any faithful representation of Greek life might be expected to be. There is no doubt that such performances like pageants do teach history to a generation that no longer reads and studies serious books. We seem indeed to be returning to the methods of mediæval times when people were taught by pictures rather than by books, the only difference being that then they could not, now they will not, read books.

GERMAN RENAISSANCE ARCHITECTURE.

ALTHOUGH modern German architecture is deeply imbued with the feeling of the "New Art" movement, there is still a proper pride and appreciation of the national architecture of Germany as exhibited in the buildings of the sixteenth and seventeenth centuries, and hence a reason for the publication of yet another work * on the particular phase of Renaissance architecture that dominated Central and Northern Europe from east to west during those centuries. The merit of the book now before us lies in the fact that it is less monumental and ponderous than many tomes that have preceded it; so that while it gives an adequate and satisfying purview of the German Renaissance by means of excellent photographic plates, this has been accomplished at quite a moderate price by the exclusion of learned and scientific analytical disquisitions upon schools and influences, periods and development, and all the other divisions and subdivisions that delight the architectural historian.

The examples chosen for illustration are gathered from all parts of German-speaking Europe, from Danzic to

* *Baukunst und Dekorative Skulptur der Renaissance in Deutschland.* Herausgegeben von Julius Hoffmann, mit einer Einleitung von Dr. Ing. Paul Klopfer. (Stuttgart: Julius Hoffmann. 25*s.*)

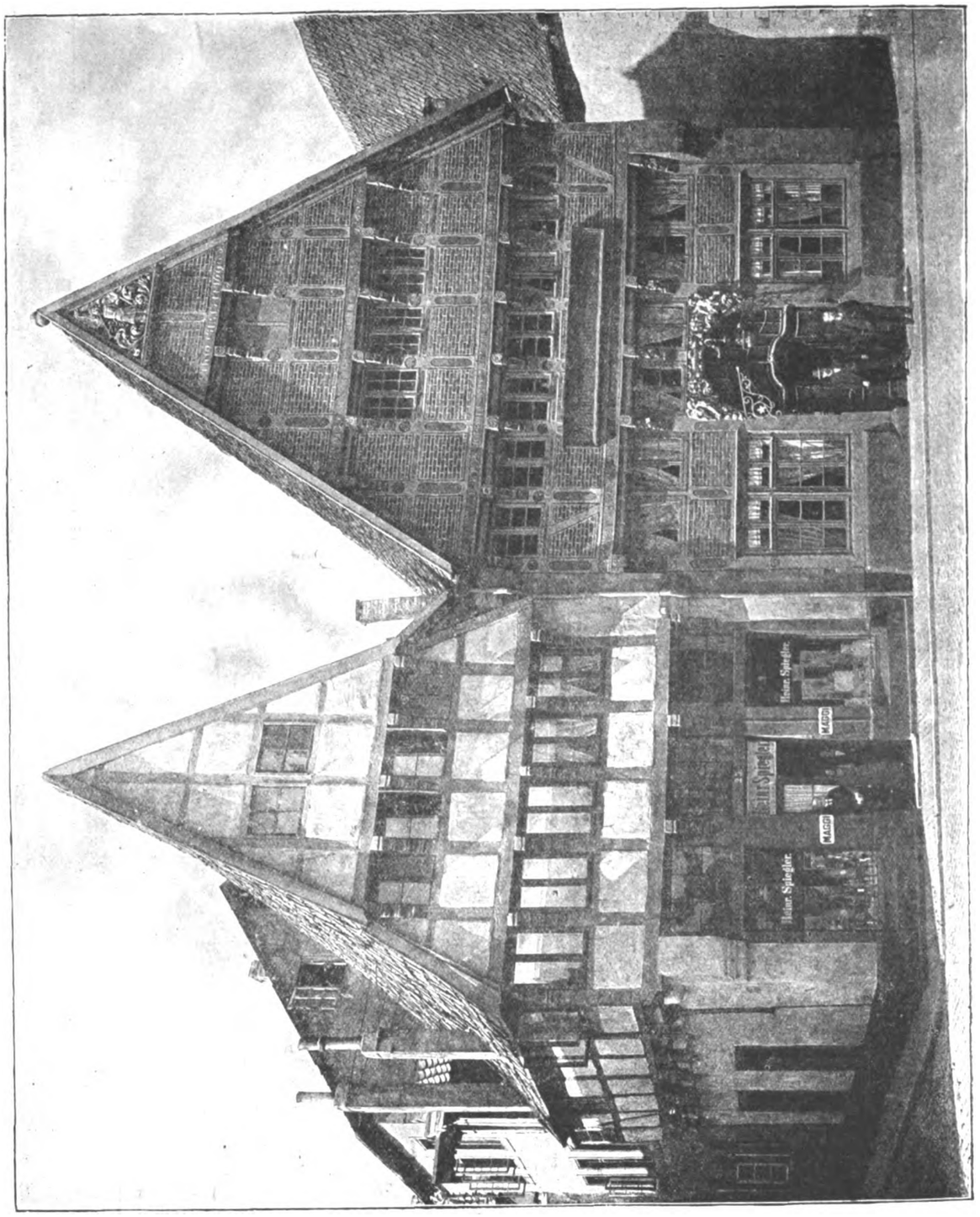
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HEIDELBERG.—THE HOUSE "ZUM RITTER" BEFORE RESTORATION.

Munich, from Strasburg to Ulm, and include specimens of Renaissance work in stone, brick, timber and slate. The peculiar treatment of half-timber work in the Duchy of Brunswick and the Kingdom of Saxony is well illustrated, the early work of Heidelberg, the charmingly picturesque buildings of Rothenburg, as well as the more generally known ones of Nuremberg. Many instances are shown of the sculpture that was so considerable an element of the German Renaissance, as well as of the particular features of various towns, the gables, the dormers, the oriels and the towers which predominate in each, for it is characteristic of German towns that certain forms are especially favoured in each, a noticeable point, for example, being the roof treatment, particularly of the ridge, which in some cities, as Nuremberg, is usually, parallel to the street, hence leading to the development of the dormer; in others at right-angles to the frontage, and so causing gables to predominate, as at Landshut,

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OSNABRÜCH.—HOUSES IN THE BIERSTRASSE.

although in this instance there are not included in this book any examples of such treatment from this particular town. Still, there are plenty of examples of the characteristic treatment of gables, as of every other feature. Ecclesiastical buildings, as well as domestic and municipal, furnish the sources from which the work illustrated is taken, so that, alike as regards locality, material and purpose, a thoroughly representative collection of examples is included, adequately showing both the general character as well as the various types of treatment and development of features, and methods of craftsmanship are brought before us. Thus we have in the form of illustrations the results of the German Renaissance movement in architecture which, if we allow that it started from the basis of the HENRI QUATRE period of French work, was ever national in its development, influenced by the characteristics of German temperament and high technical skill in craftsmanship as well as by the forms of German mediæval work, and, after its first inception, remarkably free from foreign influence, Italian, French or Flemish. Indeed, as regards this last, we can readily believe that it was Germany that gave the lead to Flanders and Holland rather than the reverse.

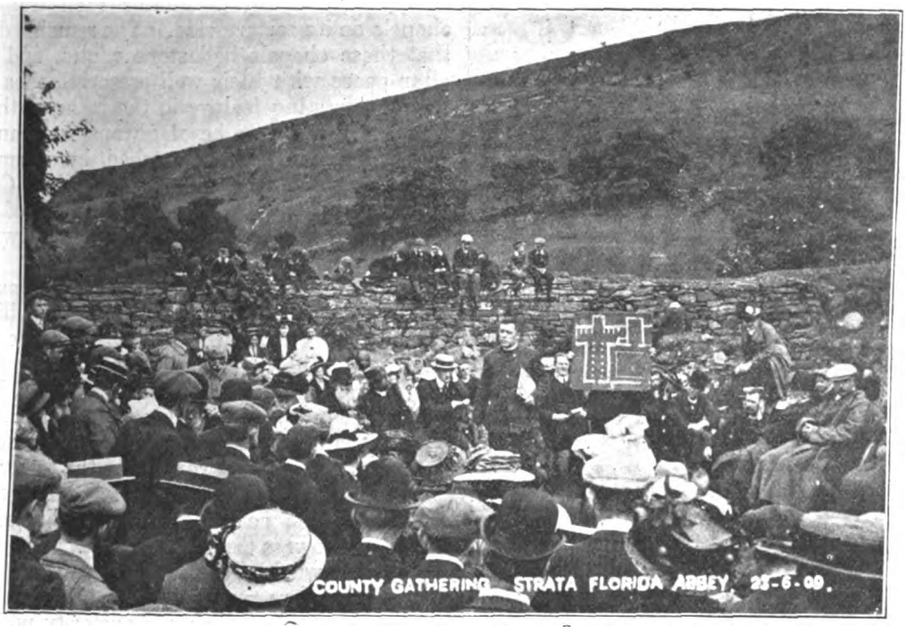
The fact that this book contains a minimum of text with a maximum of 360 illustrations, and these excellent, should particularly commend it to the many British architects and architectural students whose knowledge of the German language has deteriorated from the time of their schooldays. Everyone can understand photographs even if they cannot read the German language with readiness and ease. We have therefore no hesitation in strongly recommending this book to all those who care to know what were the excellences and the developments of the German Renaissance. Although its position in the domain of art may be discredited by the purist, it possesses many admirable characteristics of its own—picturesqueness, inventiveness, independence and earnestness combined with an evident enjoyment of the craftsman in his work that cannot fail to create interest and arouse appreciation. We are indebted to the publisher for permission to reproduce two of the illustrations in the book, which may be taken as a fair sample of the 360 included.

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THE ABBEY OF STRATA FLORIDA, CARDIGANSHIRE.

By the Rev. Professor E. TYRRELL GREEN.

THE abbey of Strata Florida belonged to the Cistercian Order. Monasticism was introduced into Europe in the fourth century, but in process of time the monks lost their ascetic ardour, rules were not faithfully observed, and the "religious" life deteriorated. St. BENEDICT (A.D. 480-540) reformed the monastic rule, and the system inaugurated by him, and known as the Benedictine rule, became the standard of the "religious" life, in the technical sense, for all time. For six centuries (A.D. 500-1100) the Benedictine was the sole monastic rule in Europe, and later Orders, such as the Cluniac and Cistercian, were really reformed Benedictines. Towards the close of the eleventh century the observance of the Benedictine rule had in some parts been relaxed, and seeing that the life of the monks tended to lose its ascetic fervour and devotion a reformation was instituted by a few monks who, under the guidance of ROBERT OF MOLESME, moved to a new abbey founded at Citeaux (*Latin* Cistercium), near Dijon in Burgundy, in 1098. The Order of reformed Benedictines thus instituted became known as the Cistercian from the name of its first monastery. The power of the Order was due partly to the revival of a very simple and austere life by the monks, but it also lay in their splendid organisation, which was the work of STEPHEN HARDING, an Englishman, second Abbot of Citeaux. St. BERNARD belonged to the new Order, joining it in 1113, and was made Abbot of Clairvaux in 1119: to him the position of great influence which the Order rapidly attained is chiefly due. He was the embodiment of all that was best in the thought of the age: he was brave and pure and consumed by a passion for the moral welfare of the people. He practically ruled Western Europe: he was arbiter in Papal elections, judge in temporal quarrels, healer of schisms, and preacher of the Crusades. It was said of him that when St. BERNARD was by mothers hid their sons and husbands their wives lest they should be persuaded by his eloquence to enter the cloister. The Cistercian Order thus gathered by ROBERT OF MOLESME, organised by STEPHEN HARDING, and inspired by BERNARD OF CLAIRVAUX, spread rapidly: it is computed that within fifty years 500 houses were founded, and in another fifty the number had increased to 1,500. The first Cistercian house in England was established at Waverley (Surrey) in 1128. Then followed the foundation of the great monasteries at Rievaulx (1131), Fountains (1135), Furness (1148), Kirkstall (1152), Roche (1165), Byland (1170), and Jervaulx (1180), all in the north of England. Beaulieu (1221) and Netley (1239), in Hampshire, were established a little later. The lovely abbey at Tintern was built later still (1269). The chief houses belonging to the Order in Wales besides Strata Florida were Valle Crucis (Denbighshire, 1200), Cwmhir (Radnorshire, 1143), and Margam (Glamorganshire, 1147). The chief Cistercian monasteries in this country are remarkable for the beauty of their position and surroundings, being situated in remote spots and in narrow, secluded valleys, in conformity with the rule of the Order, which laid down "in civitatibus, in castellis aut villis nulla nostra construenda sunt cœnobia, sed in locis a conversatione hominum semotis." The Cistercian rule was marked by a stern simplicity and austerity of life: only one meal a day was allowed during a great part of the year; meat was never eaten, fish only occasionally; hours of silence were enjoined, the wearing of shirts, gloves, and boots was forbidden, and the monks engaged in manual labour, becoming especially skilled agriculturists and horticulturists. The spirit of the Order found its outward expression in the severe simplicity of the architecture of its churches; it held up before men the sternest mode of life as the ideal and refused the appeal of elaborate ritual and splendid art. Thus for many years the Cistercian abbeys were characterised by a rejection of the richness and beauty which men commonly lavished on the sanctuary. By the rules of the Order stone bell-towers were forbidden, nor might the wooden belfry be a structure of any considerable size; human heads or any representation of the human figure were not allowed in the carving of the church, other than statues of Our Lord Himself or figures of the Crucifix. The windows were not to be filled with stained glass. The vestments used at the altar were to be of coarse linen, and precious metals or jewels were not allowed for the sacred vessels; even the chalice and paten at the altar might be of no more costly material than silver-gilt. It is true that this twelfth-century Puritanism in time outgrew its fear of beauty, and its laws in this respect were not so strictly kept, yet simplicity and restraint remained characteristic of the Order and are very marked features of the architecture of its earlier abbey churches, such as Furness, Fountains, Kirkstall, and of this at Strata Florida.



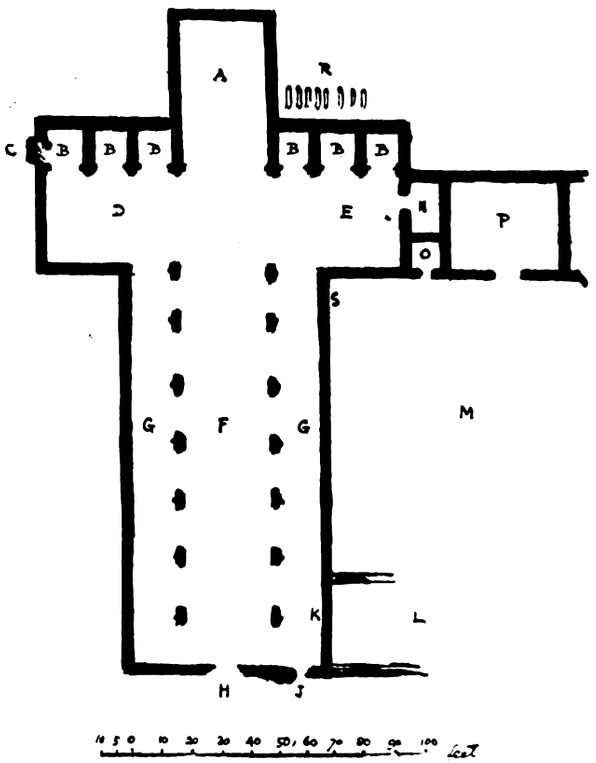
The abbey of Strata Florida was founded on its present site (there had apparently been an earlier monastery at a spot about two miles off, still known as Hen Mynachlog) by RHYS AP CRUFFYDD, Prince of South Wales 1164-6. The precise date is not clear, but in 1184 a charter was given to the abbey by the same Prince, confirming previous gifts. The great church was in building when Archbishop BALDWIN of Canterbury stayed at the abbey on his tour through Wales in 1188 preaching the Crusade, and it seems to have been completed in 1201.

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PLAN OF THE CHURCH.

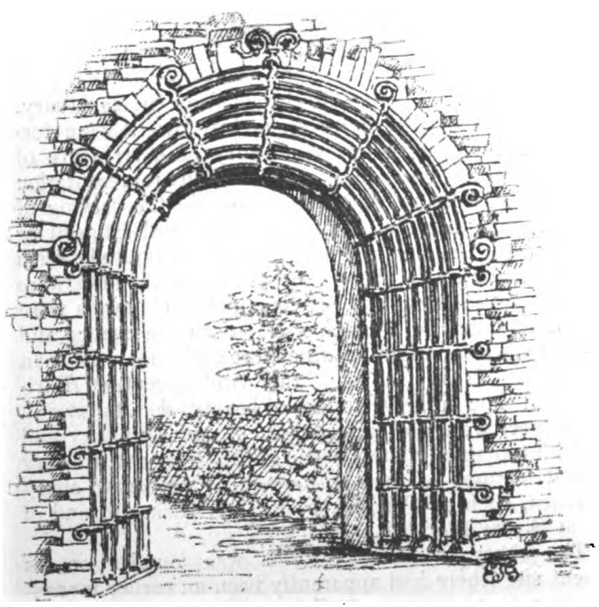
The plan of Strata Florida shows a typical Cistercian abbey church, having all the striking peculiarities which marked the architecture of the Order.

(A)—*Rectangular and Aisleless Choir.*—While, like most of the greater churches of the time, the Cistercian abbey churches were cruciform, the choir was as a rule rather short in proportion to the rest of the building, rectangular in its termination at the east end, and a simple parallelogram on the plan, without aisles, projecting chapels, or procession path behind the high altar. Strata Florida furnishes an excellent example of this simple plan for the choir. The Romanesque builders of Western Europe generally used the apsidal chancel, as seen, *e.g.*, in some of the great Norman churches in England, such as Norwich and Peterborough cathedrals. This plan was often complicated in the greater churches by carrying the choir aisle all round the apse and by the addition of a number of radiating chapels at the east end. But Citeaux, the mother church of the Cistercian Order, was a church of a simple Burgundian Romanesque type, with rectangular choir, and this became the pattern plan for the abbey churches of the Order, to which there are few exceptions. The persistence of the rectangular east end in English architecture has often been remarked, and forms one of the obvious points of contrast between English and Continental church architecture, the apse (polygonal or semicircular on the plan) being on the Continent the usual termination for the choir. Amongst the causes which determined the English preference for the square-ended chancel it is likely enough that we ought to reckon the influence exercised upon our national style by the great Cistercian abbeys of the twelfth century.



STRATA FLORIDA ABBEY.

A. Choir.
B. Chapels.
C. Remains of Staircase.
D. North Transept.
E. South Transept.
F. Nave.
G. Aisles.
H. West Door.
J. Window.
K. Remains of Staircase to Domus Conversorum.
L. Site of Domus Conversorum.
M. Cloister Court.
N. Sacristy.
O. Cell.
P. Chapter House.
R. Monks' Cemetery.
S. Traces of Doorway from Church to Cloister.



WEST DOOR.

(B)—*Range of Chapels to the Transept.*—Another peculiarity of the Cistercian churches, well illustrated at Strata Florida, is the row of chapels, two, or more often three, in number, ranged along the east side of each transept, and separated from each other by solid walls of masonry. The transepts are without aisles (like the choir), and at Strata Florida each transept has three chapels on its eastern side. The remains discovered show that these chapels had stone vaults, and the altars and altar paces with their well-preserved tiles *in situ* form a most interesting feature in the ruins of the abbey. The tiles are thought to be of Shropshire manufacture, their patterns having been matched by examples found at Shrewsbury Abbey and at Tong and Cound (both in Shropshire). A date about the middle of the fourteenth century is indicated by the costume shown in the figure of a man borne by some of these tiles.

(C)—*Absence of Tower.*—Allusion has been made to the rule of the Cistercian Order by which stone bell-towers were excluded. One of the first reasons which led to the building of towers to churches was, of course, to provide a suitable structure for the bells, but it is equally clear that many early bell-towers are both taller and more ornate than was necessary for this purpose. It was often in the height and adornment of the tower that the power and influence of the founder of a church or the prosperity of a monastic corporation was indicated to the world. Thus bell-towers came to be looked upon as emblematic of pride and wealth, and they were therefore regarded by those who were responsible for the Cistercian rule as out of keeping with the simple austerity which should mark the Order. The builders of Strata Florida seem to have been true to their regulations. There are no traces of western towers observable, and if there was any structure rising above the level of the roof at the junction of nave, choir, and transepts it could only have been a low lantern, because the piers at the crossing, when compared with the piers of the nave arcade, give no evidence of that extra thickening which would have been necessary had they been intended to carry the weight of a central tower. It was only at a much later period than that to which the structure at Strata Florida belongs that, in violation of the doctrine and discipline of the Order, towers were added to some Cistercian abbey churches, as at Fountains and Kirkstall.

STYLE OF ARCHITECTURE.

It was in the latter half of the twelfth century that many of the great Cistercian abbeys were built, and this was a period of transition in architecture. It was at that time that the pointed arch began to be used by the builders of Western Europe, though the general character of their structures remained unchanged, together with most of the detail and ornament, so that between the Romanesque (or Norman, as we generally call it in this country) and the pointed styles there intervened a transition period when architectural style was still in its general character Romanesque, but the arch took the pointed shape, especially when used in construction, smaller arched openings such as doorways or windows

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often remaining round-headed. Thus, both at Kirkstall and Fountains, the massive piers which divide the nave from the aisles bear pointed arches, while windows and doorways have semicircular arches, the doorways having deeply recessed and moulded arches quite in the Norman manner. The somewhat scanty remains at Strata Florida, oddly enough, contain in the west wall one arch of each kind, the semicircular arch of the great door and the pointed arch of the window to the south of it, thus showing that the church here was of the same transition style as the great churches of the Order named above, though built a little later.

A peculiarity of Cistercian churches (or at any rate of the earlier ones) was the absence of human heads or figures in the carved work. This was by rule of the Order. In the tympana of Norman doorways and in the richly moulded semicircular arches of the later Norman style figures of men, animals, and fearsome beasts often occur. In the numerous abbey churches of the Cistercians built during the first two centuries of the existence of the Order there are few, if any, exceptions to the rule which forbade decorative representations of the kind, while, on the contrary, human figures carved in stone abound in contemporaneous buildings belonging to other Orders. The capitals of pillars, for example, were often elaborately carved with illustrations of incidents from Scripture story, like the wonderful series in the richly adorned Romanesque church of St. Denis at Amboise. But the Cistercian churches had an air of solemn and severe grandeur, superfluous or ornate carving being as a rule excluded, and the capitals being ornamented only with a plain scallop (as at Fountains) or with simple mouldings (as at Tintern). The carved work at Strata Florida is exceptional. The capitals and other carved portions show a decided tendency to interlacing ornament, such as we see in Celtic manuscripts and in early Celtic crosses, such as the fine examples at Nevern and Carew in Pembrokeshire and at Llanbadarn Vawr in Cardiganshire. The same kind of interlacing ornament may be seen, too, on the crosses which mark the graves in the monks' cemetery at Strata Florida. Yet another feature at the abbey which suggests the influence of early Celtic art is the very peculiar adornment of the splendid west door to the nave, where the mouldings run all round without any capitals, as in some Irish examples, and the unique transverse bands terminate in scrolls or curls somewhat resembling a pastoral staff.

The fact that the rubble of the walls at Strata Florida has been very roughly put together renders it probable that the church was plastered on the outside, as it certainly was internally. The "putlog holes" are still plainly to be seen in the fragment of the west wall of the church that is standing. These holes go right through the wall, and into them logs of timber were inserted upon which planks were placed as a scaffold, the use of scaffold poles being thus avoided. The "putlog holes" were not closed up when the building was completed, but were left open so that the monks could at any time repair any portion of the wall without the trouble and expense of erecting an elaborate scaffold.

THE DOMESTIC AND OTHER BUILDINGS.

As was almost invariably the case in Cistercian houses, the domestic buildings at Strata Florida lay to the south of the church. Immediately to the south of the nave was the cloister, and from this a door in its north-east angle led into the church. The chapter house was entered from the east walk of the cloister. This was a rectangular building lighted from the east, with seats round the walls for the monks in chapter assembled. The space between the south transept of the church and the chapter house was divided into two parts by a partition wall: the eastern portion of this space was the sacristy and communicated with the church by a doorway in the south wall of the transept. The western part of the space seems to have been an unlighted cell. A similar cell occupies an analogous position in the plan of almost all Cistercian monasteries, and its use cannot be determined with anything like certainty; it is thought, however, that it may have been a punishment cell for monks who had been guilty of some breach of the rules of the Order. In the angle between the choir and the south transept was situated the monks' cemetery, and during the excavations conducted under Mr. STEPHEN WILLIAMS, F.R.I.B.A., in 1887-8 a most interesting series of graves of the monks was brought to light. These are covered with rather rough slabs of local stone, one of which has an incised cross. Some of the tombs have their carved head-stones still *in situ*: these take the form of small crosses and are adorned with interlacing patterns of a Celtic type.

On the west side of the cloister, and in line with the west front of the church, was the usual place for the Domus Conversorum, or house of the lay brethren, in a Cistercian monastery. The staircase near the west end of the south aisle, which led from the church to this building, may still be traced at Strata Florida.

While the position of the chapter house, sacristy, and cloister have, through the researches of Mr. STEPHEN WILLIAMS, been clearly defined, the domestic buildings at Strata Florida have not been thoroughly excavated, and are somewhat difficult to trace. This is probably due in some measure to the fact that the abbey suffered greatly, in the first place, through more than one fire—an accidental one through lightning in 1284, and again when burnt by the English soldiery in the Welsh wars of EDWARD I. (1294). The abbey suffered perhaps even more through being used as a military post, when, during and for some time after the troubles caused by the rising of OWEN GLYNDWR, it was occupied by a garrison of archers and men-at-arms in the reigns of HENRY IV. and HENRY V.

Long before the dissolution of the monasteries many of the buildings seem to have been in ruins. But, notwithstanding the devastation of fire and sword, in spite of the centuries of neglect and decay since the dissolution of the monastery, and although its stones must often have served as a quarry for farm and other buildings in the neighbourhood, enough still remains of the once stately church of Strata Florida to show that, like the other great churches of the same Order, its construction and decoration alike evidenced that ascetic ardour, that temperate good taste, that straightforward procedure and practical utility which characterised the Cistercian rule.

KEBLE COLLEGE, OXFORD.*

By D. J. MEDLEY, M.A.

KEBLE COLLEGE was opened in 1870. It was the outcome of a movement which had begun as early as 1845. In that year a memorial was presented to the Hebdomadal Board embodying the views of a number of influential persons that, in the interests of the Church, it was necessary to put the means of higher education within the reach of those who could not afford the expense of residence at the existing Colleges. Among the signatures to this memorial are those of Lord ASHLEY (afterwards Lord SHAFTESBURY), Mr. GLADSTONE, Dr. PUSEY, and A. C. TAIT, the future Primate. But it was twenty years before the matter took actual shape. In the interval, however, there had been growing a strong feeling of the need "for the extension of the University in some form or another." Ultimately a meeting was held on November 16, 1865, in the hall of Oriel College under the chairmanship of the Provost, "to consider the question of the extension of the University, with a view especially to the education of persons needing assistance and desirous of admission into the Christian ministry." It will be seen that the scope of the question had been somewhat enlarged in the twenty years since the presentation of the memorial. At the meeting six sub-committees were appointed to deal respectively with the subjects of the foundation of a new large College, the adaptation of the existing Colleges, residence in lodgings either with or without connection with the existing Colleges, the needs of poor medical students, the affiliation of other places of liberal education. Of these the first sub-committee alone concerns us. It con-

* See Illustrations.

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sisted of seven clergymen—Dr. SHIRLEY (the chairman), Dr. PUSEY, Professor MANSEL, and the Revs. R. GRESWELL, J. RIDDELL, J. W. BURGON and W. INCE, together with two laymen, Professors BERNARD and BURROWS. It is interesting to note the points in the scheme which they formulated. They considered that it would be practicable to found a new College or Hall and to conduct it on a scale of charges lower than was prevalent in the existing Colleges under the following conditions:—The rooms should be smaller than were usual in the other Colleges, and should be furnished at the expense of the College; they should be arranged along corridors instead of by staircases—a method which the committee believed "to be not only more economical, but intrinsically superior, more comfortable and better adapted to modern habits of life." Breakfast as well as dinner was to be served in the College Hall. Caution money and entrance-fees should be materially reduced if not abolished. Everything necessary to living in ordinary comfort should be included in one fixed terminal payment, and a limit "narrower than is usual in most Colleges" should be fixed to the amount of extra battels. The committee was, however, careful to remark that in their recommendations they did not contemplate the establishment of a "Poor Man's Hall"—that is, "of such an eleemosynary establishment as would be sought only by persons of inferior social position, less cultivated manners or attainments and intellect below the ordinary level of the University, but rather of one which is adapted to the natural habits and tastes of gentlemen who wish to live economically." All these suggestions were carried out in the arrangements of Keble College. The rooms are smaller than is usual in the older Colleges, they are furnished at the expense of the College and are arranged along corridors. Breakfast, lunch and dinner are all served in the Hall except for those who are on the sick-list. There is no caution money and only a small entrance-fee; but tuition, board and lodging are all paid for in one fixed terminal payment, and there are restrictions on such extra expenditure as may be incurred through the College kitchen. Time has no doubt produced certain modifications in the original arrangements. The formation of the building was found to lend itself to an undue amount of social intercourse, and yet while the partition of the corridors reproduced in a somewhat modified form the staircase system of the older Colleges, a small passage in the partition still made possible that ease of service on which the economical working of the College so largely depends. Again, although many fathers found it possible to send their sons to Oxford because of the reduced expense, the new College from the first contained an appreciable number of men who would have come to the University in any case. There are some critics of the new College who maintain that it is possible for an undergraduate to live as cheaply at several of the older Colleges as he can live at Keble. Possibly it is so; but one who knows the life at Keble both as undergraduate and as don is inclined to doubt whether equal social advantages are to be purchased elsewhere for the comparatively moderate sum which will carry a man comfortably through his time at Keble. Moreover, it cannot be denied that there is no College at which the *general* standard of expenditure is pitched so low.

(To be continued.)

ILLUSTRATIONS.

COMPETITION DESIGN FOR MIDDLESBROUGH PUBLIC LIBRARY. BY WILLIAM HAYWOOD.

IN this scheme the library is entirely isolated, the space at the side of the juveniles' library serving to isolate the building against risk of fire from adjoining property. The committee's requirements, although in some respects unusual and difficult, have been successfully embodied in a simple and straightforward plan: special attention is called to the cross ventilation of every room. *The Plan.*—The lending library is suitable for either open access or indicator systems. It is well lighted from opposite sides by windows which reach the ceiling, providing a total glass area of 480 square feet to 2,590 square feet of floor area. The shelving shown upon the plans accommodates 30,000 volumes, but 40,000 could be shelved without difficulty. The entrance to juveniles' library is well removed from the main entrance; the portions screened off for boys and girls are served from a common counter, the attendant being under supervision from, and within easy communication of, the lending service for adults. The shelves reserved for juvenile literature accommodate 5,000 volumes. The news room has windows on all sides; no top lights are considered necessary, although the roof is entirely available for that purpose as directed. The room and its entrance are under the direct supervision of the janitor. The janitor's room also controls the ladies' room and the main entrance. The service hall, book lift, and stairs (the stairs are in straight flights), the work room, staff room, lavatories, files room, and store rooms are all compactly and economically planned, yet in close touch with every department, and under the immediate control of the chief librarian. The reference library is entered directly from the upper hall: it is a room of considerable architectural importance, an importance largely due to the way in which the future extension has been provided for. The gain is not only in appearance, but the supervision is perfect, and an extended gallery also has been obtained. The lighting is from the top (single glass roof lighting as directed), with clerestory windows to give cross ventilation. The wall cases on floor and gallery combined will shelve 30,200 volumes. The librarian's room is in contact with the law library, reference library, main stairs, service stairs, and staff rooms. The files room is on the same level as gallery, and a large store is provided in the roof. The elevations have a classical and refined appearance. The design grows naturally out of the plan, which is clearly indicated in the external features of the building, and the proportions and relative values have been carefully adjusted by means of a clay model. It is proposed to use Portland stone for the frontages to Dunning Street and Grange Road, with local bricks elsewhere. *Estimate*:—Cubical contents, 303,528 cubic feet at 9½*d.*, 12,014*l.* 13*s.*; railings, &c., to Grange Road, 150*l.*; total, 12,164*l.* 13*s.*

COMPETITION DESIGN FOR MIDDLESBROUGH PUBLIC LIBRARY. BY JOHN H. MARKHAM, A.R.I.B.A.

THE cost of the building was stipulated to be not more than 12,000*l.*, and the particulars of accommodation required fixed the position of the three principal rooms in such a way as to greatly hamper the designer. The lending library and reference library over were to adjoin the old buildings at the north end of the site, and the general news room was to be a one-storey building with a separate entrance, and was to be at the corner of Grange Road and Poplar Street. These requirements left only a few smaller rooms to be arranged by the competitors, and the areas required were such that the space left for corridors and staircases was quite insufficient for a building of any importance. In the design submitted by Mr. JOHN H. MARKHAM, of 2 Gray's Inn Square, W.C., the elevations were kept very plain, as it was necessary to cube the building at 8½*d.* in order that it might be carried out for the sum allowed. Any attempt to obtain absolute symmetry would have meant forcing the plan somewhat, as it was distinctly stated that there were to be no windows in the reference library, and windows seemed very desirable in the corresponding rooms on the other side. The materials were red brick and stone.

VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON.—INTERIOR OF EAST HALL—INTERIOR OF WEST HALL.

THESE illustrations refer to an article in last week's issue, and, together with those therein, are from photographs furnished by the Board of Education.

OXFORD COLLEGE SERIES. KEBLE.—HALL AND ENTRANCE—INTERIOR OF HALL.

THESE illustrations show part of the buildings of Keble College, erected from the designs of the late Mr. WILLIAM BUTTERFIELD.

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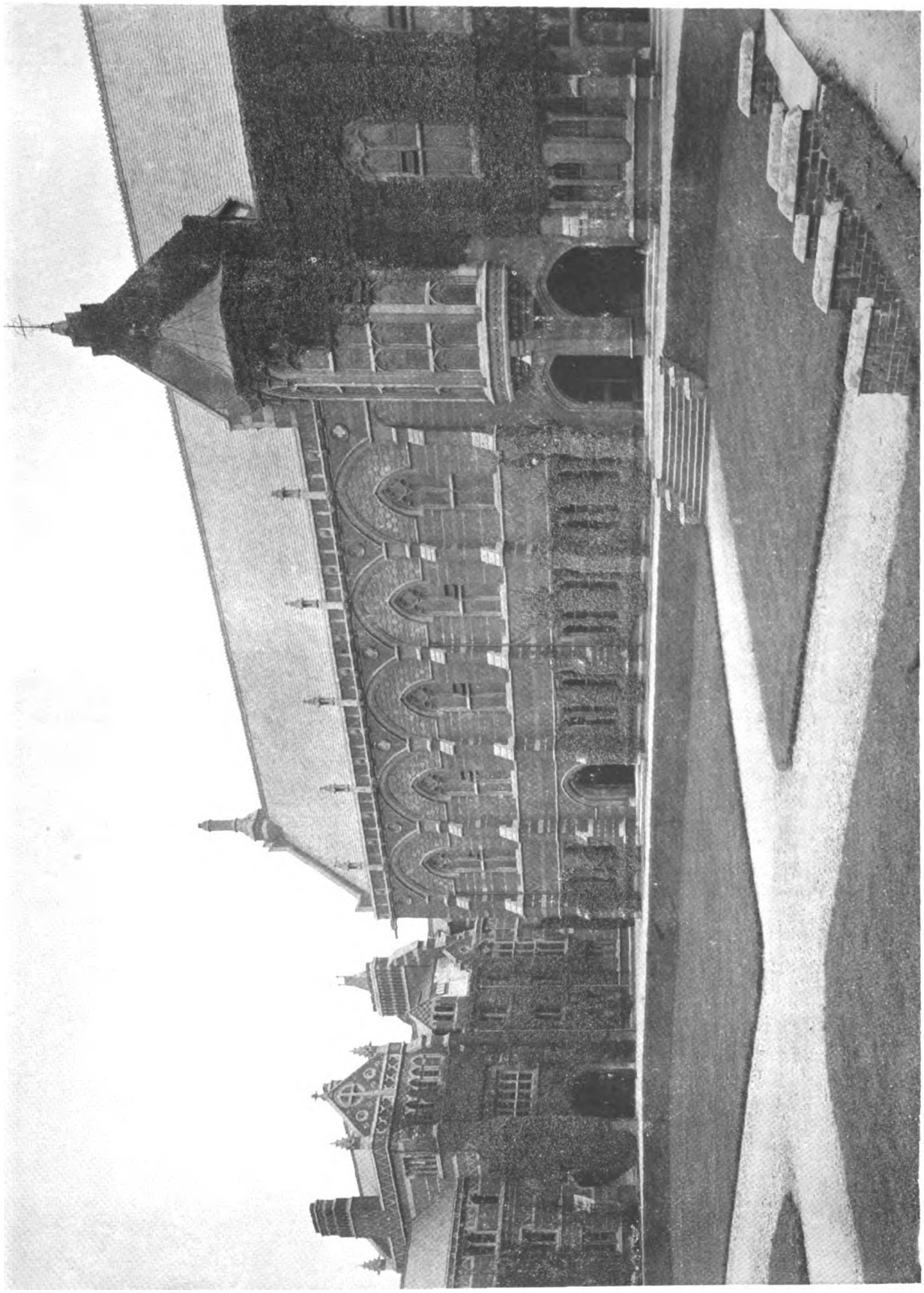


Photo by A. E. WALSHAM, 60 Doughty Street, W.C.

OXFORD COLLEGE SERIES. No. 49.—KEBLE: HALL AND ENTRANCE.

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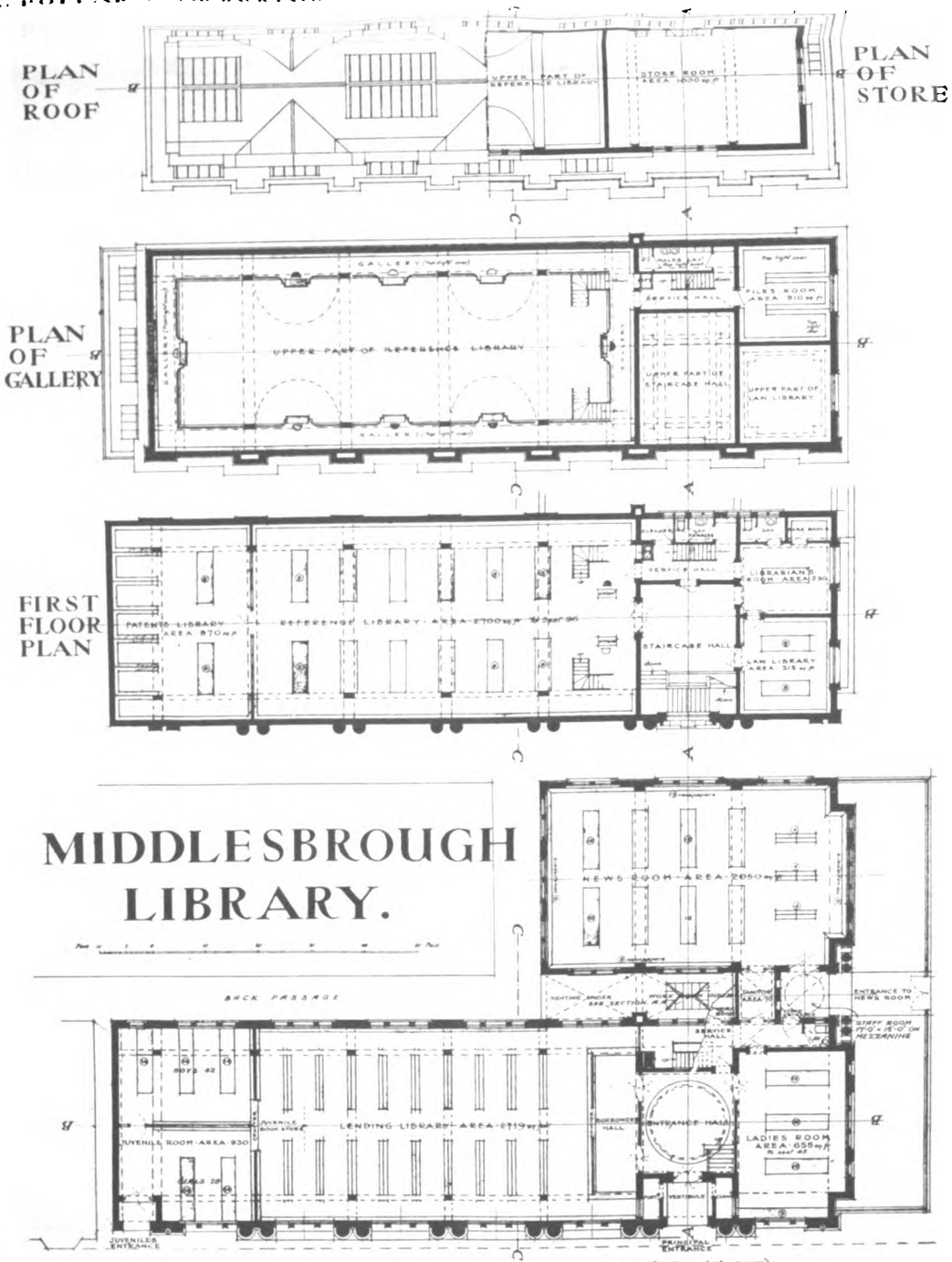
VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON: INTERIOR OF EAST HALL.

SIR ASTON WEBB, R.A., Architect.

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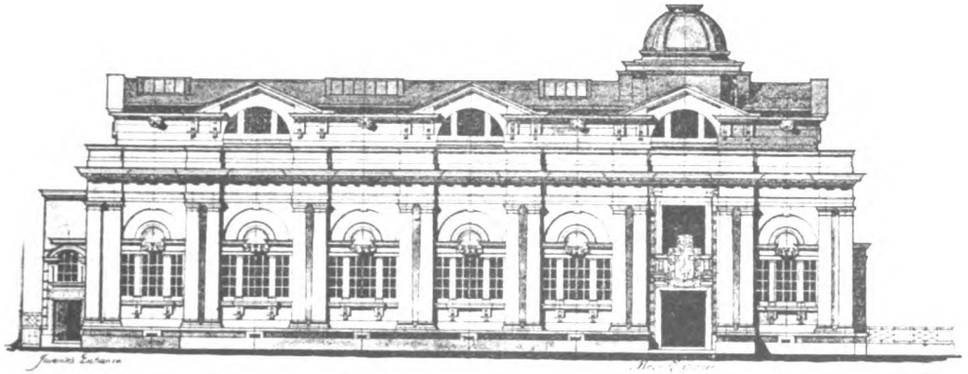


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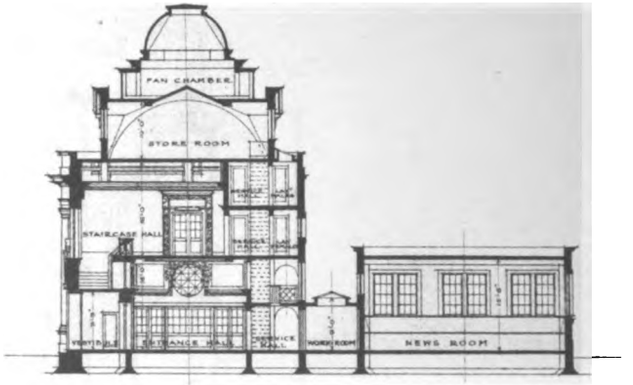
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By WILLIAM HAYWOOD.

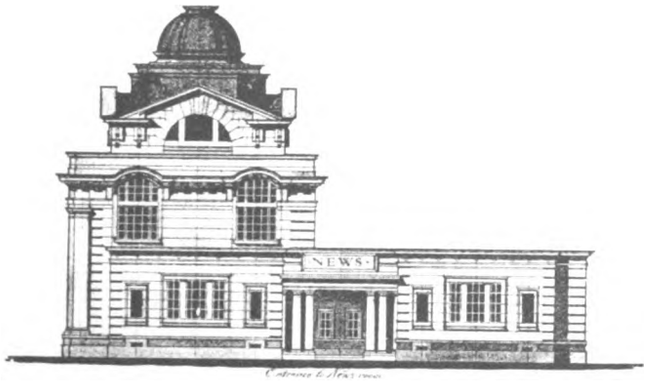
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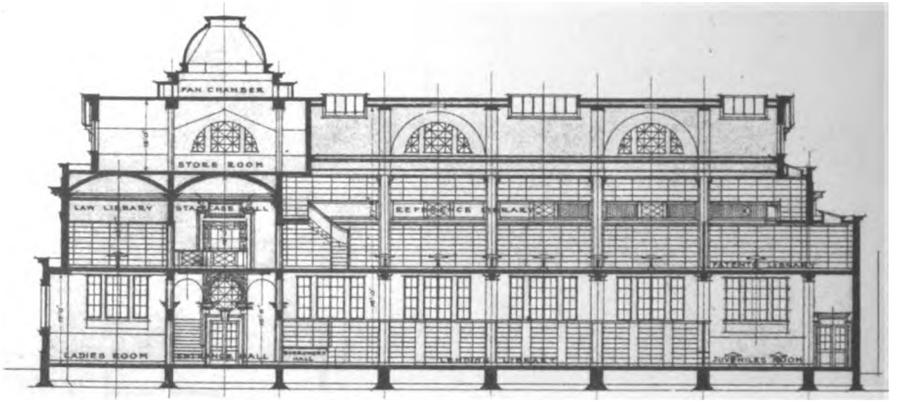
ELEVATION TO DUNNING ST



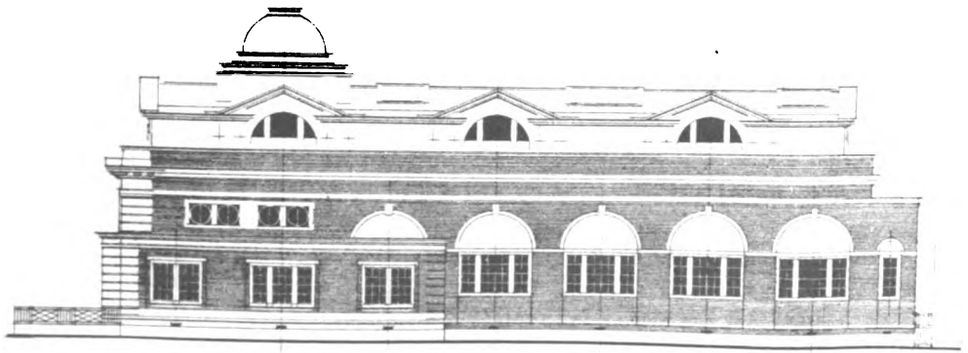
SECTION·A·A·



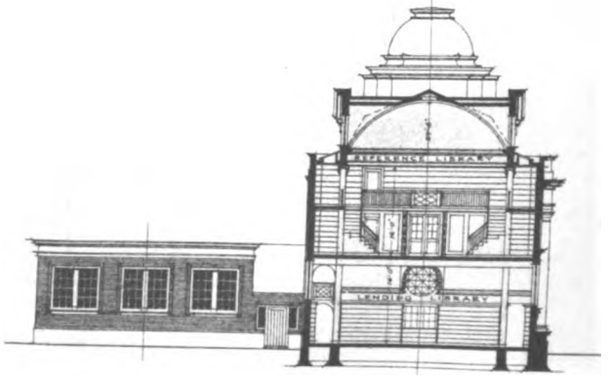
ELEVATION TO GRANGE ROAD



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ELEVATION TO POPLAR ST AND BACK PASSAGE



SECTION·C·C·

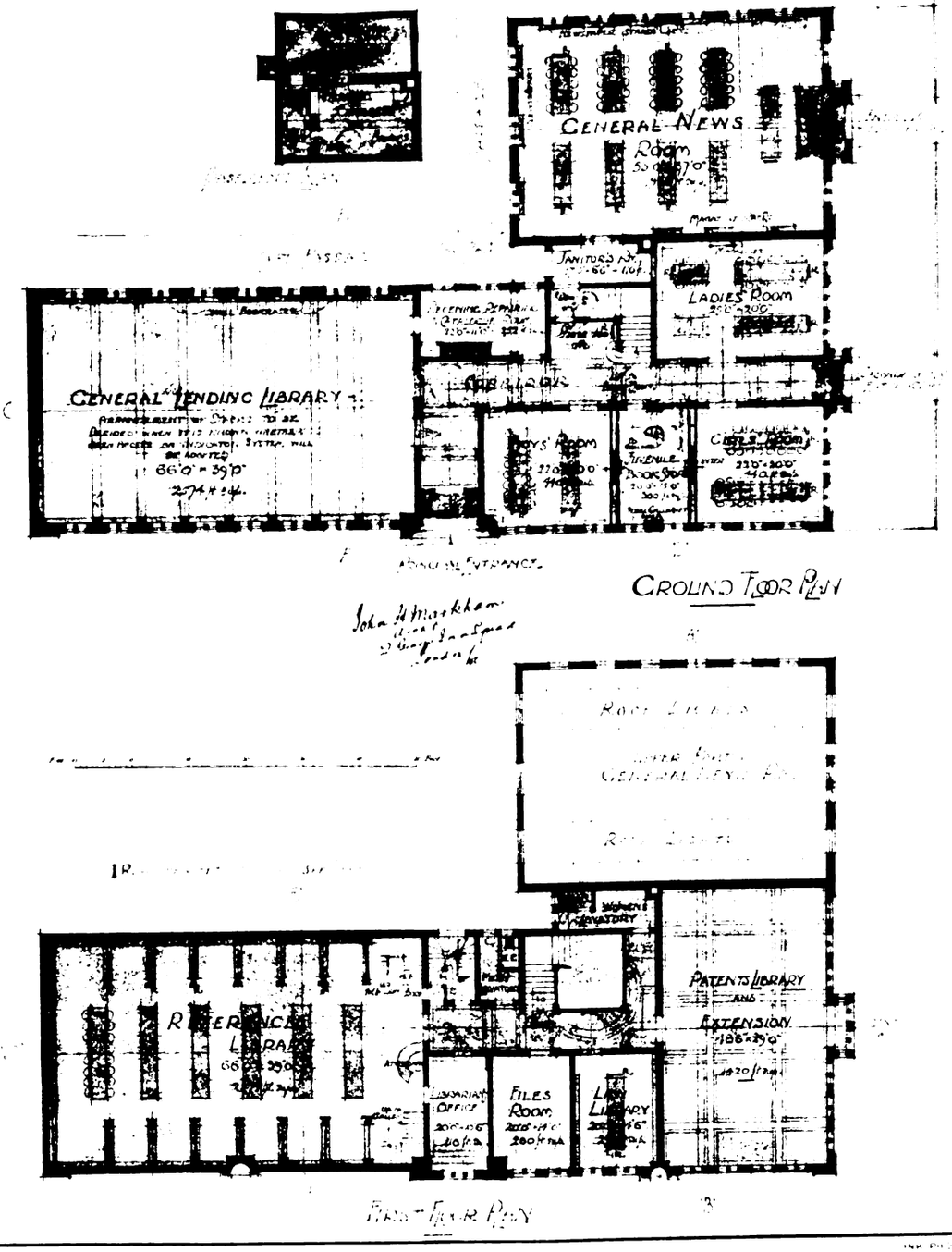


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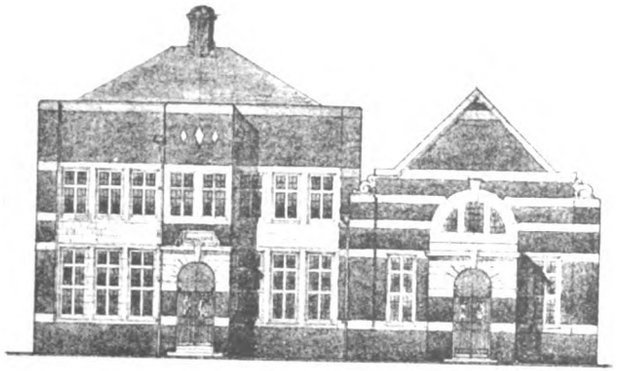
COMPETITION DESIGN FOR MIDDLESBROUGH PUBLIC LIBRARY.

By JOHN H. MARKHAM, A.R.I.B.A.

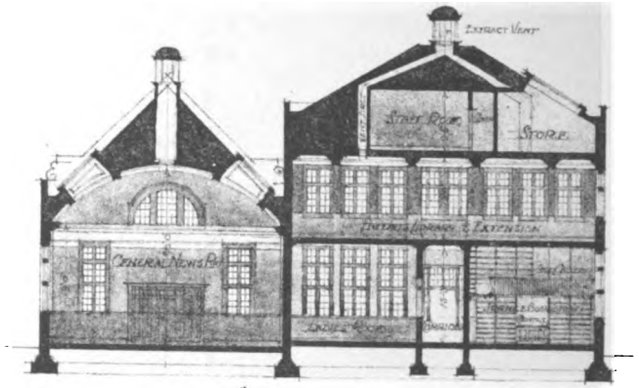
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COUNTY BOROUGH of MIDDLESBROUGH

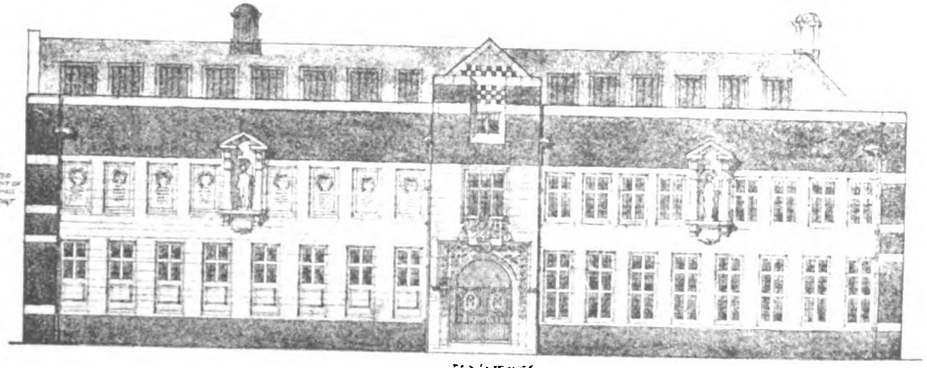
PROPOSED PUBLIC LIBRARY



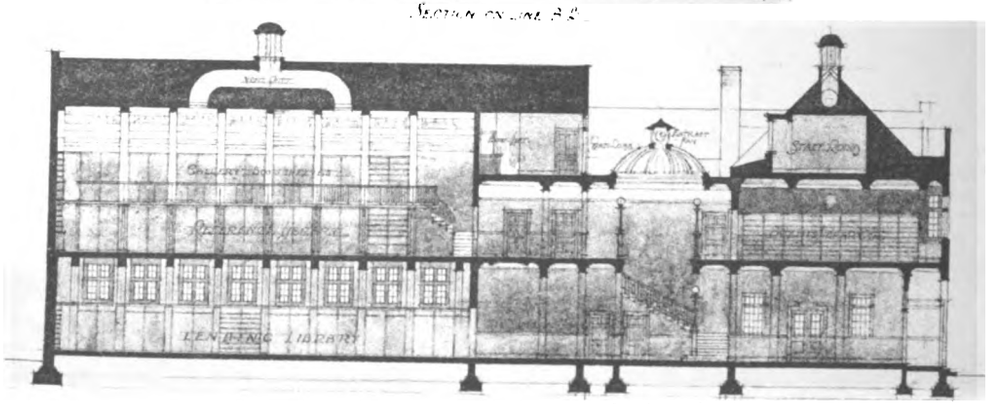
ELEVATION TO GRANGE ROAD



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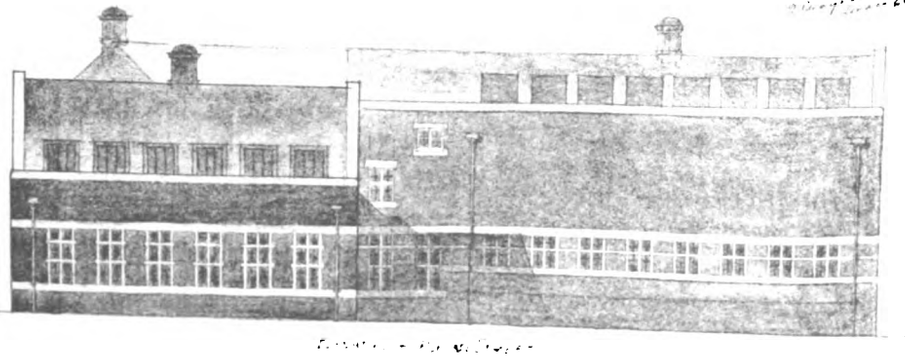


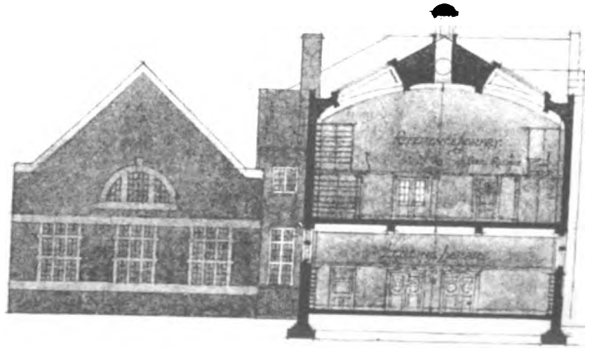
ELEVATION TO DUNNING STREET



SECTION ON LINE C-D

John W. Wimpenny
Architect
Middlesbrough





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VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON: INTERIOR OF WEST HALL.

SIR ASTON WEBB, R.A., Architect.

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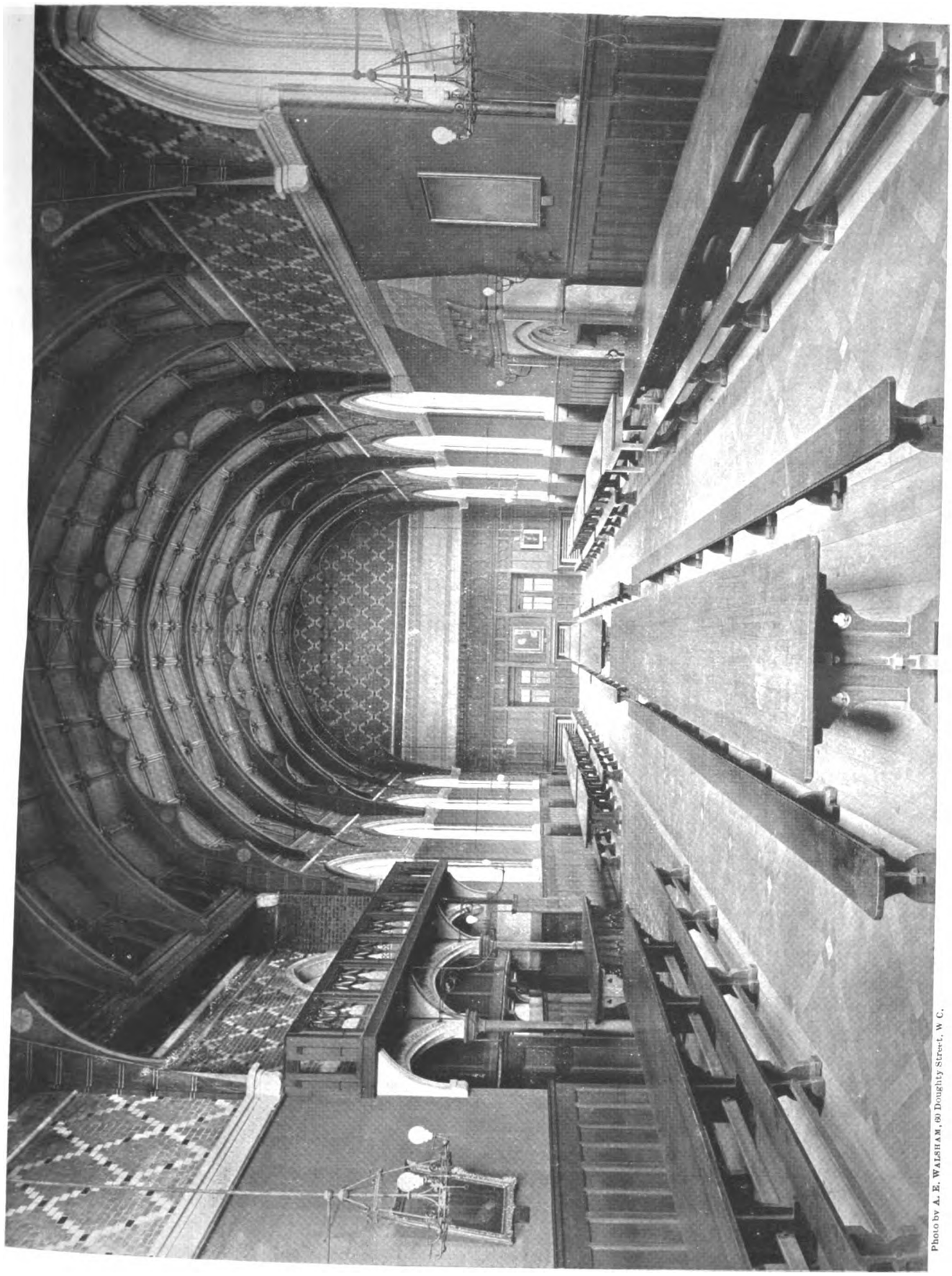


Photo by A. E. WALSHAM, 60 Doughty Street, W.C.

OXFORD COLLEGE SERIES. No. 50.—KEBLE: INTERIOR OF HALL.

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EXHIBITION OF COTTAGE DESIGNS, MANCHESTER.

THE Royal Manchester Institution has promoted a very interesting and instructive exhibition of designs for cottages, and these are now on view in the City Art Gallery in Moseley Street. As the collection is free, it is clear that the scheme is purely for educational purposes, and as such it seems to be appreciated and should have a practical value and effect upon work done in the busy industrial district of which Manchester is the centre.

The designs show clearly that a practical point in cottage planning has been reached; no longer is the problem in the Lady Bountiful or model-village stage, for no matter how much praise is given to those landed proprietors whose desire for a pretty village often caused them to lay out capital in an unproductive way, practical builders know that the only true solution must be to produce buildings that not only exactly fit the requirements of the inhabitants, but also on a reasonable expenditure provide a fair return for the money spent.

In fitting the requirements there are certain essentials to be borne in mind, and as these essentials vary in different localities, either through custom or climate, it follows that any architect having received a commission to design such buildings should first of all make himself thoroughly familiar with the local notions, otherwise he will probably injure his client in not securing a fair return for his outlay. Three bedrooms should always be provided, but the question of the "parlour," so loved in many localities, seems to have been avoided in most of the plans. Experience shows that it is not an acceptable thing to put a good big living room at the front and a small parlour behind; the tenant will in most cases reverse the architect's notion and crowd his family into the small room, keeping the front room as the parlour. However foolish this notion may appear to those accustomed to larger houses, it is a real difficulty that must be met if the property is to let well. It is no good pointing out to them how much more cheerful, healthy and comfortable it is to have a big room at the front and no best room for very occasional use. The fact remains that such a room is ardently desired, and this desire ought certainly to be met.

To turn to the designs themselves, they are of great value to any student by reason of their being drawings of executed work, and the actual cost of many of them is given. No. 1 (J. Wornell, Slough) is a simple treatment in rough cast and tile, but the bedrooms are very small. No. 2 (A. W. Worrall, Wolverhampton) is a pleasing design, but the staircase is dark. No. 3 (Parker & Unwin) is more ambitious, and provides a bath-room, but again the stairs are dark. No. 4, by the same authors—a pair of parlour cottages at Fortune Hill, Hampstead—is a beautiful example of architectural draughtsmanship and is also a very pleasing design, but again the stairs are dark and the windows generally are too small; probably they comply with the minimum permitted by the by-laws in force in the locality, but in the North of England such small windows would act as a deterrent to letting.

No. 5, by the same authors, is an ingenious adaptation of two and three bedroom houses dovetailed into one another, but the effect suggests a tenement house. No. 6, by the same authors, has bedrooms 6 feet 1½ inches wide between walls, and these rooms would be little more than cupboards, and the grouping suggests a charitable institution, and this surely is the last thing to be aimed at. Ordinary folk want a house to look like a home.

No. 8—same authors—has a very small kitchen, about 7 feet by 8 feet, and lit only in one corner. This plan is not worthy of the authors.

No. 10—same architects—is a much more successful solution. The houses look like a home and not an institution, but the windows might be bigger. The cost is, however, somewhat high; 306*l.* without land cubes out at 6*d.*—rather high for industrial purposes.

No. 11, by Geoffrey Lucas, is a very pretty design, but really Mr. Lucas would not like to pass a few days on a sick bed in one of the bedrooms; he would find it the reverse of cheerful. The only practical place for the bed is 20 feet away from a small window, and that again is a dormer deeply set in the lean-to of the roof.

No. 13, by J. A. Hallam, is a single cottage at Letchworth. A photograph shows an exceedingly pretty living room interior, but the principal bedroom is just 20 feet long by 12 feet wide and is lit by two deeply recessed dormers, which cut up the room so much that the only place for the bed is in a dark corner against the slope of roof. If the furniture had been planned in the rooms, instead of trouble taken to show the stone or tile paving outside, such a grave fault as this would have been avoided.

No. 14 (Baillie Scott) is a stagey affectation and by no means to be taken as a serious solution of an ever-pressing problem.

No. 15 (Parker & Unwin), a pair of thatched cottages erected in a place where no by-laws exist, is an object-lesson of the necessity of such laws. Tiny windows and bedrooms whose sloping ceilings come to within 4 feet of the floor are not desirable, by-laws or no by-laws.

No. 17 (R. Bennett & W. Bidwell), a block of six cottages. A nice simple treatment, but the central cottages have very cramped entrances and the stairs are dark.

No. 21 (same authors) has three good square bedrooms, a living room and kitchen; but let the authors try to deliver the coals into the small door provided for that purpose, its sill being 4 feet from the ground. Such homely details require attention.

Nos. 27, 28 and 29 (Edgar Wood), a row of houses at Middleton. The doors, directly opposite one another at each end of side passage, ensure a very good draught in such an exposed situation, and the treatment of the shop in No. 29 is very fidgety. The simple treatment of No. 27 is much happier.

Exhibit No. 30 consists of two large sheets, and is an academical compilation by a committee of the Manchester Association of Architects to show how a certain locality could be laid out. It is a very praiseworthy attempt and reflects great credit upon the Association. It is suggested that so many Oriental domes would become a bit monotonous, and indeed are hardly suitable to the locality.

Nos. 31 and 32, four cottages at Earswick, would give trouble unless the coal cellar, earth closet, and entrance doors were clearly labelled.

Nos. 36 and 37 (by Spiers & Beavan, Cardiff) are well planned and picturesque in elevation, whilst the photograph of the actual building shows how very successful the authors have been.

Nos. 39, 40 and 41 (W. R. Mosley, Cardiff) are very pleasing. The rooms are of good size and square, the staircases have windows, and the cost is reasonable.

Nos. 42 and 43 (G. Fraser, Liverpool) are lodges, but as they cost 700*l.* each, with only cottage accommodation, do not really come into the problem. The elevations are carefully designed.

No. 48 (A. Randall Wells) is one of the most pleasing designs in the exhibition. It is good value for the money (305*l.*), and shows a long house, and there is much to say for such a plan if land is cheap, as all rooms get abundant lighting and there is a chance to avoid any dark places. Other designs by the same author are on the same lines, and all are pleasing.

No. 53, a group of cottages at Port Sunlight (Bradshaw & Gass, Bolton). These are only suitable for a millionaire's purse, and are cut up so unnecessarily that the result is a jumble, whilst the flashy colouring only serves to emphasise the defect of design. A far better rendering of this design is the coloured perspective hanging below it.

Nos. 54 and 55 (W. Owen, Warrington), another Port Sunlight group, is very restrained, magazine detail being carefully avoided, whilst the photograph of the executed work confirms the restful, quiet effect.

No. 59, Port Sunlight (Ormerod & Pomeroy, Bolton), a clever, up-to-date drawing such as would attract a competition committee; but the photograph of the actual work reveals how very different the real effect is from that suggested by the drawings.

Nos. 63, 64 and 65 are more Port Sunlight cottages, by Messrs. Ernest George & Yeates, and are delightful designs, full of restraint and good feeling; the only fault to be found is the dark staircases. No. 67, at same place, by Douglas & Minshull, is a masterly design, very homelike and quiet, but rather expensive.

Nos. 69 and 70 (T. T. Rees) are very nice and quiet and the cost reasonable, but the bedroom oriels in No. 70 are too small for their purpose.

No. 72 (H. B. Bare, Liverpool) is an actual working drawing, not a sketch for exhibition, and is therefore very interesting to architects. The accommodation is all that could be desired, but the cost per cottage—386*l.*—seems rather too much for the purpose.

In another part of the Art Gallery the Manchester Academy of Fine Arts are holding their jubilee exhibition, and amongst the pictures are some works by architects that are well worth examination.

No. 2, a design for the Manchester Town Hall by the late E. Salomans, is not a happy design; whilst No. 42, a water-

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colour of Jumièges Abbey by the same hand, is a most delightful work, one that the visitor will return to with pleasure.

No. 7, a large perspective drawing of the Clock Tower, Manchester Town Hall, by the late A. Waterhouse, in his well-known and vigorous draughtsmanship. Its strong lines and characteristic brown tones seem just the thing to express an architectural design, and are well worthy the consideration of the younger generation of exhibitors of cottage plans. Here are no dodges, but good direct draughtsmanship.

No. 11, a brown wash detail study of the entrance to Ashby Folville Manor, by John Ely, is a beautiful design, most artistically drawn, and this again may be commended to the modern draughtsman as an example worth following.

No. 12 is a rather thin design for rebuilding Manchester Cathedral, by the late Isaac Holden. One cannot regret that it never came to fruition.

No. 18 is a sketch for the Manchester Town Hall by A. Waterhouse; probably an alternative design that certainly justifies the selection made by the Corporation.

No. 23, a rather hot drawing of Hulme Grammar School by A. H. Davies Colley. It was erected in 1886, and marks the progress made in such work since that time. It is doubtful whether it would be erected now.

No. 44, a sketch in Winchester Cathedral, by John Ely, is a beautiful work, evidently a labour of love on the author's part. Nos. 68 and 72 are sketches in Venice by W. H. Littlewood, and are both capitally rendered. Possibly the colour in No. 72 has faded since 1896, but allowing for that it is a fine work.

No. 83, by the late A. Darbyshire, is a brightly coloured drawing of Brereton Hall. The perspective is a trifle loose, but all the same it is a careful study of a delightful bit of old work.

TOWN PLANNING IN WIESBADEN.

THE National Housing Reform Council, it will be remembered, organised a party numbering eighty-six to visit and study examples of town planning in Germany in April last. Among the various municipalities represented was Birmingham, who sent a deputation of the housing committee. The deputation have just issued their report on Cologne, Düsseldorf, Wiesbaden, Frankfort-on-Main and Nuremberg. These towns had their own peculiar problems to solve, and the report indicates the different character of each. The account of the visit to Wiesbaden is of special interest. It is certainly true when the deputation remarks that "inasmuch as Wiesbaden is not an industrial town it is perhaps not very valuable for the purpose of comparison with Birmingham, but it is a splendid example of how a town can be made beautiful by foresight in planning." For this reason this part of the report will be specially interesting to our readers. Moreover, it includes an address by one of the best-known authorities on town planning, which deals with the subject as a whole.

Wiesbaden is a town of 104,522 inhabitants, with an area of 9,000 acres, 3,540 of which are owned by the municipality.

Wiesbaden started its town planning by planning a district at a time, but it was ultimately found that to do the work satisfactorily, a comprehensive scheme must be made for the whole town. This was done, and the town divided into a number of different districts for statistical and development purposes. Bye-laws were made to suit the likely requirements of each district, regard being had in particular to the price of land in each district. This was fully explained by Professor Eberstadt, a leading authority on town planning, who delivered the following address to the party:—

"In comparing Wiesbaden with the other towns which you have visited or will visit, the most important point to bear in mind is the extreme rapidity of its development into a large town, which has taken place within the last twenty-five years.

"Before a general building plan was drawn up for Wiesbaden, building plans had already been devised for smaller districts to meet the needs of the moment. At the beginning of the nineties, a building plan based upon a judgment delivered by Professor Baumeister, of Karlsruhe, was drawn up, comprehending the whole area of the town as far as the outside parishes.

"This judgment, with its general guiding principles, together with the experience gained in the meantime, and the rules based upon the science of town planning, served to indicate the lines to be followed in drawing up the special building plans, a task which is now nearly accomplished. The land round the nucleus of the town, before the building plans were drawn up, was agricultural land, such as we still see in the environs of Wiesbaden. This land was, for the most part, in the private possession of citizens of Wiesbaden. The owners on each side were compelled, in accordance with the Prussian Building Lines Act of July 2, 1875, to provide the land required for the laying down of streets up to a limit of 6 metres in width, without compensation.

"The width of the streets varies enormously, according to their position and importance, their gradients, and the traffic which they are intended to serve. New streets are, as a rule, laid down with breadth as follows:—Dwelling streets, 9.50 to 13.50 metres; secondary traffic streets, 13.50 to 24.00 metres; circular streets, 26.00 to 37.50 metres; chief traffic streets, 26 to 50 metres; show streets (?), over 50 metres.

"The town of Wiesbaden is divided into seven building areas. The distribution of buildings on the various areas is as follows:—

"A. In the three thickly-built building areas.—For the purpose of computing the amount of ground available for building, the building surface is divided into three zones. Zone 1, six metres parallel to the boundary line; zone 2, 26 metres parallel to zone 1; zone 3, the remainder of the building surface. The front garden is not included. Building is allowed as follows:—On building area No. 1 (thickly covered), zone 1, 100 per cent; zone 2, 60 per cent.; zone 3, 50 per cent. On building area No. 2 (moderately covered), zone 1, 100 per cent.; zone 2, 55 per cent.; zone 3, 40 per cent. On building area No. 3 (sparsely covered), zone 1, 100 per cent.; zone 2, 40 per cent.; zone 3, 30 per cent. The height of the buildings is equal to the breadth of the streets, but must be at least 11.00 metres. The buildings must not be higher than 19.00 metres in areas 1 and 2, and 15.00 metres in area 3, and may contain, in areas 1 and 2, not more than four, in area 3, not more than three habitable storeys. The height of each storey must be at least 3.00 metres.

"B. In the four open building areas (villa areas).—The whole building surface, inclusive of the front garden, is included in the computation. The height of the buildings is independent of the breadth of the streets. Building is allowed as follows:—Building area No. 4 (block buildings).—Not more than 40 per cent of the building plot and not more than 6.00 cubic metres of enclosed space to each q.m. of building plot. Distance of buildings from the boundary line of each plot at least 3.00 metres. Height of buildings not more than two and a half times distance from boundary line, and not more than 15.00 metres. Three habitable storeys exclusive of attics or loft. When different houses are joined in one block, the length of this may not exceed 50.00 metres. No buildings may be erected at the sides or behind. Building area No. 5 (fairly open), 3.33 per cent., 3.5 cubic metres. Distance of boundary line 4.00 metres. Height of buildings double this distance, not more than 15.00 metres. Three habitable storeys exclusive of attics or loft. Semi-detached houses and side buildings permitted. Building area No. 6 (moderately open), 25 per cent., 3.00 cubic metres. Distance of boundary line 5.00 metres. Height of buildings one and three-quarter times this distance, at most 15.00 metres. Three habitable storeys, exclusive of attics or loft. Semi-detached houses and side buildings permitted. Building area No. 7 (wide open), 20 per cent., 2.5 cubic metres. Distance of boundary line 5.00 metres. Height of house one and three-quarter times the distance, at most 19.00 metres, in three habitable storeys, exclusive of attics and loft. Semi-detached houses and side buildings permitted."

The party were afterwards driven to see the town planning features. Here again they saw miles of magnificent streets, all trees planted and laid out with the view of subsequent development. Every effort has been made by the municipality to preserve all possible amenities to their town, and large sums of money have been spent in its development, the Kurhaus alone costing about 300,000*l*.

As Professor Eberstadt is not altogether in agreement with the German system of housing the people, it may be interesting to point out that he is opposed to the tenement system, and much prefers the single house system of this country. He expressed the opinion that nothing costs a nation so much as the building of bad houses. Later on, Professor Eberstadt, in response to a request made by the party, delivered the following address and criticism upon the German town plan system:—

"Town planning, let me first say, like many other institutions of our country, is not native to Germany, but has been imported from France. I could trace in France instances of town planning in the sixteenth century. We find a cer-

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tain building policy in Paris under Henry II., and a deliberate town extension under Henry IV. This French system of building towns and quarters was adopted by our German States in the seventeenth century, and has done marvels in our country. States and provinces which had been ransacked, burnt, and destroyed during the Thirty Years' War were awakened to life again, had population, industry, and towns restored, and if in this country you can discover no trace of the pillaging and the devastation that some of our neighbours have inflicted upon us, it is owing—some old castles excepted—to the town building policy of the State absolutely.

"This is the source of our competence in town building. For the nineteenth century the administration of town building was partly handed over to the self-governing bodies. The immediate supervision of building was reserved to the police, while the most weighty competence of town planning passed to our municipal self-government. They had to execute.

"It is said, 'You carried out your town planning, but you have done it by destroying home.' This, indeed, is the price we have paid for it. Why, we must ask, was it done in this way? Why did it come to this? A development which took fifteen years to investigate you will not expect me to explain to you in fifteen minutes. All I can do is to separate, to pick out a few features, and give you my opinion with reference to these rough items. I shall, then, just dwell upon one singularity. It is the training of our technical staff and the views on town building at the beginning of the new period of municipal development. The new rise in our modern towns began in Germany—twenty years later than in England—about 1860. One of the reasons why our towns were built in the manner which you see now is that our architects and officials were trained to the old tradition of town building. What this old tradition meant, and what should have been done in its place, I may explain in the shortest way by comparing the two systems, the requirements of old and modern town building.

"The first contrast between the old and the new is the inversion in the importance of the centre and the outskirt. In our old system the centre of the town is the best and most desirable residential district; the outskirts are for the lower and poorer class. In the modern town the centre is no more a residential district, and the outskirts are the most important part of town development. The old town system was centripetal, the modern one is centrifugal. A perfect rupture with the old system should have been necessary, as has indeed been effected in England. For our country the system of cutting up the land and guiding the streets that was traditional, and all right for the central parts, was preserved and adopted for the town extension.

"The second contrast is, and should be, the town of the preceding period was a town of burghers, tradespeople, craftsmen, with a certain mixture of small or poor people. The town of our days is a workmen's town—perhaps you may say a town of proletarians; at any rate, 92 per cent. in our country are wage-earners who want the small dwelling, and 8 per cent. only belong to the upper classes. The small dwelling should be the prominent feature of our modern towns. The structure of the population is altogether altered.

"The third contrast is, up to the beginning — in our country to the middle—of the last century our men of business used to reside in the house where their trade was carried on. In the modern town the upper classes live in residential districts, and the bulk of the people—the working people—naturally never knew it otherwise. The modern town has to provide for purely residential districts. So the new town had quite new requirements to meet. But none of these three great problems has been solved, not even faced, in our country. We have merely preserved the old system, enlarged it, and exaggerated it; and this is one of the reasons why a competence good and useful in itself, beneficial in former days, has not proved a success with us.

"Town building or constructing may be divided into three sets of competences in our country—town planning, by-laws with reference to buildings, and real credit for procuring capital. As for town planning, you now know our system, which is broad streets and expensive methods of paving. This is the starting-point; the first of the premises which follow each other without mercy to the conclusion. It means—according to our system—expensive streets for the ground owner, dearness of the land, accumulation of tenements, high-storeyed buildings and courtyard dwellings. Our town extension is handicapped by a powerful speculation, and is altogether defective.

"To avoid some of the mistakes in our town-planning, I advocate the construction of streets into traffic streets and residential streets; but I should rather call them non-traffic streets, because the most prominent feature would be to exclude traffic. It is hardly possible to give you an idea of the effect, and, I might say, of the fitness and the beauty of the non-traffic street. The old towns knew these streets and I have gathered some examples, reproduced in my handbook, 'Augsburg, Ulm, Danzig.' The by-laws must be made to conform with town planning This has been again mixed in most cases in our country. You are aware that our by-laws have the constructions by zones and districts. It is the most lovely domain of red-tapeism. There routine and uniformity, ordering about and giving directions, attain their highest triumph. But even if it be moderately done it is not always well done.

"We come now to a competence somewhat similar to what you call limiting the number of houses per acre. We limit, as you know, the percentage of area that may be built upon and the number of storeys. I think it is a mistake to single out absolutely certain districts and give rules of uniformity for them. There is nothing absolute in town building; you must observe and give in everywhere. The right principle to me seems to be inter-crossing of streets according to their use and construction.

"The great problem now is to keep down and regulate prices of land. Beyond doubt, there is a danger that town planning may act as a pacemaker for land speculation. For town planning does not change agricultural land into high-priced building ground, but at least it gives the expectation for this change. It says to the speculator, 'I show you the land where you may invest.'

"I do not think there is much to be feared if three things are provided:—1. Traffic streets and means of transport must first be made and precede the development of the land. 2. The type of house which is the most convenient for private enterprise and building trade must be preserved and protected in town planning and in by-laws. 3. Make it as safe and as profitable as you can to employ private capital in productive enterprise and production of houses, and make it as unsafe and unprofitable to invest in land speculation. A low ground-rent, a high income for personal activity and enterprise, that is what you are to aim at."

THE ELECTROLYTIC THEORY OF THE CORROSION OF IRON.*

(Concluded from last week.)

SINCE the presence of the polarising film of hydrogen arrests the further solution of the iron, it is obvious that in order for the reaction to proceed this hydrogen must be removed. The destruction of the hydrogen film in ordinary corrosion is accomplished by the oxygen of the atmosphere, which is dissolved in the water. The action here taking place is a simple union of the hydrogen on the iron and the oxygen dissolved from the air, with the re-formation of water. It follows from this that any substance which dissolves or reacts with hydrogen should accelerate corrosion. This is found to be in fact the case.

It was formerly thought that the action of oxygen as a factor necessary in corrosion was simply to oxidise the iron ions thrown into solution, and to precipitate them as rust. While it is true that this reaction does take place, and is indeed the most striking function that oxygen performs, it is in reality a secondary one, which is simply incidental to corrosion and not a necessary part of the action. Its real accelerating effect is due to the fact that it depolarises the hydrogen which is set free by the reaction, and separates out on the metallic iron.

That this is true may be seen from the consideration of a number of now well-known phenomena. When a piece of iron is placed in ordinary water exposed to the air it will dissolve or rust. If now there be placed in the water with this piece of iron a piece of platinum, the solvent or corroding action of the water will not be changed. The oxygen is present in the solution as before, and the iron ions as they separate from the metallic iron are being oxidised and precipitated as rust. If now the platinum and iron be electrically connected, a marked increase in the rate of the solution or corrosion of the iron is noticed. No chemical condition has been changed; the difference lies in the fact that there is now an electrical contact between the iron and the platinum, and the platinum furnishes a surface on which the hydrogen can deposit, and on which, by virtue of its catalysing action, the hydrogen will be rapidly oxidised by the dissolved oxygen and thus removed from the sphere of action.

* From a paper presented to the Iron and Steel Institute by William H. Walker, Boston, U.S.A.

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Or if in two limbs of a U-tube separated at the bottom by a jelly plug there be placed two pieces of the same iron, electrically connected, and in a very dilute solution of any electrolyte, and both of these limbs be protected from the air, no action will be noticed. That is, there will be on both pieces of iron points at which iron has gone or tends to go into solution, and points at which a film of hydrogen has deposited, and owing to the resistance of this film of hydrogen no local currents can pass over the surface of the pieces of iron, and no current as a whole passes through the jelly plug at the bottom, or through the system as a whole. If now there be placed in one of the limbs a substance which will unite with hydrogen, such as potassium bichromate or alkaline hydroxylamine, still no action will be observed in that limb, but the iron in the other limb will pass into solution and a current of electricity will pass through the system.

A third example is found in the action of zinc in water containing an electrolyte. If a strip of zinc and a piece of iron be placed in water containing a very little salt, the iron will corrode rapidly, while the zinc will be but slightly attacked. The usual explanation for this phenomenon is that the zinc protects itself with an adherent film of zinc oxide or hydroxide, while the iron produces a non-adherent voluminous hydroxide which does not protect. If now instead of being separated the two strips of metal be placed so as to touch each other, the iron no longer corrodes, but the zinc rapidly passes into solution. A piece of zinc is seen at the centre, corroding slightly from the ends, and showing the red due to the separating hydrogen ions at the centre. Zinc ferricyanide is white, and hence the same reagent demonstrates the separation of zinc ions just as it does the iron ions in the plate already considered. The nail which has been connected to another piece of zinc is not corroding, but is protected by the separating hydrogen. The zinc thus connected, however, is seen to be rapidly dissolving. The presence of the iron cannot affect the nature of the coating of zinc hydroxide which in the previous case adhered thereto and protected, according to the old explanation, the sheet of zinc, nor can the presence of the zinc affect the oxidation and precipitation of the iron ions should they pass into solution as they are wont to do. The explanation consistent with the electrolytic theory is that the zinc in the first arrangement does not dissolve and corrode, not because there was formed an adherent and protecting layer of zinc hydroxide, but because the surface of the zinc does not catalyse the reaction $H_2+O=H_2O$ with sufficient rapidity to continually remove the hydrogen from the surface of the zinc. The film of hydrogen, therefore, forms on the zinc and protects it. Although the catalysing action of the iron surface is not so rapid as is the platinum surface, it has sufficient rapidity to depolarise the iron strip and to render continuous the solution, and therefore the corrosion of the iron. While the solution pressure, that is, the tendency to pass into solution, is much stronger in the case of the zinc than it is in the iron, the iron corrodes and the zinc does not, because the electrolytic double layer set up on the surface of the zinc cannot rapidly be destroyed by a flow of electric current. When the two are united, the greater solution pressure of the zinc forces a large number of zinc ions into the solution, and the next result of the flow of the current is that the zinc soon becomes anodic over its entire surface, while the iron becomes the cathode, and that no iron is then dissolved, but as a cathode furnishes a surface on which the hydrogen, set free by the solution of the zinc, may be deposited and catalysed and removed.

Having now a conception of the mechanism by which iron corrodes, some important conclusions may be drawn from a consideration of the factors involved. Since before the iron can form rust it must first pass into solution, and in so doing cause an electric current to flow from the iron at that point to the iron at some other point, any circumstance which will aid the flow of this current will accelerate the solution of the iron. In other words, any differences in potential which may exist upon the surface of the iron will in itself cause a flow of electricity which will result in a solvent action on the iron. Such differences of potential inevitably result from a segregation or uneven distribution of any impurities which the iron or steel may contain. Hence we should expect that the speed of corrosion would increase in accordance with the percentage of impurities present, and it should decrease in accordance with the care bestowed upon the iron or steel during its manufacture to prevent a segregation of these impurities. The simplest way, of course, to insure an absence of segregation is to eliminate altogether those materials not needed in the iron. It has been found that a steel made under such conditions that the total impurities are reduced to not over five hundredths of 1 per cent. (0.05 per cent.) resists corrosion to an extent equal to the iron of our forefathers. The steel companies have been slow to accept this general proposition, but it is gratifying to know that material of this purity may now be obtained on the open market.

Since iron can pass into solution only by assuming the ionic form, and having at the same time an equivalent amount of hydrogen pass from the ionic condition to the gaseous state, the speed of the reaction will depend upon the number of hydrogen ions present in the solution. The effect of free acids has already been noted; but the presence of any material, such as alum or magnesium chloride when subjected to pressure, or other materials which by hydrolysis will form an acid, will also accelerate corrosion.

If, on the other hand, the hydrogen concentration be reduced, the corrosion of the iron will also be decreased. Such a condition may be most easily realised by adding to the water a strong alkali, which, owing to the presence of a large number of hydroxyl ions, decreases thereby the number of the hydrogen ions. This is the probable explanation why the iron of Dr. Friend's experiment did not corrode in the presence of oxygen and hydrogen. It has been shown by conductivity experiments that it is impossible to remove all the caustic soda from iron and glass by a few rinsings. It is worthy of note that the only time when the iron was not soaked in caustic soda it rusted, notwithstanding the absence of any carbonic acid.

This fact has an important bearing upon the question which has lately been much discussed, as to whether concrete will protect iron from corrosion. Inasmuch as Portland cement, when it sets or hardens, liberates a large quantity of caustic lime, which is a strong alkali, and since good concrete is therefore saturated with this strong alkali, the answer to the question must be in the affirmative. Iron or steel will not corrode when embedded in concrete. But caustic lime is soluble in water, and poorly made concrete is not impervious to water. Therefore, if iron be embedded in concrete through which water at any time be allowed to percolate, this calcium hydrate will be slowly but surely dissolved and washed away, and with it will disappear the inhibiting action of the concrete, and iron embedded therein will surely rust. To insure absolute protection of the reinforcing members of concrete construction, therefore, such concrete must be sufficiently dense and carefully made to render it practically waterproof. This is not an impossible condition.

The fact that the presence of a metallic iron surface accelerates the corrosion of zinc has an important bearing upon the protection of such structure as barbed wire fencing, or any structure where both an iron and zinc surface are exposed. In making barbed wire fencing, for example, the wire is first galvanised and then wound into fencing, the cross wires forming the barbs being cut at an angle in order to make a pointed barb. This freshly cut surface of iron is thus exposed, and so furnishes just the surface required for depolarising the zinc surface, and thus greatly increases the rapidity with which the zinc coating will corrode. As the zinc coating recedes from the iron surface, the latter rusts on account of the low conductivity of the water film on the two, and hence the explanation of why deterioration of a barbed wire fence always starts at the barbs and travels from there along the strands. It also shows the necessity of protecting those places on a galvanised structure from which the zinc, from whatever cause, has been removed.

Since oxygen is necessary to insure the continuous removal of the hydrogen film, it is obvious that if no oxygen be allowed to reach the iron through the water, no corrosion can take place. This fact teaches us much regarding the corrosion of boiler shells and tubes. Pitting may be entirely avoided if the air be removed from the feed water before its introduction into the boiler. This may be best done by the employment of an open feed water heater, or, what is better still, a feed water heater connected to the dry vacuum pumps of the condenser. If such treatment is not possible, the air may be removed from the feed water by drawing the water through a closed box containing scrap iron; the oxygen in the water is used up in corroding the scrap iron instead of the boiler tubes. Or the oxygen in the water may be absorbed by feeding into the boiler with the water a very small quantity of an alkaline solution of a tannin material. Such a solution of alkaline tannate will break up under the pressure and temperature of the boiler, with a formation of a pyrogallate of the alkali, and this rapidly absorbs the oxygen. Soda ash, or rather alkali, is of course useful, but not because of its effect upon the oxygen content, but because,

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as has already been explained, corrosion is inhibited by thus decreasing the hydrogen ion concentration of the water.

Tin is a metal which, like copper, accelerates the corrosion of iron by aiding in the oxidation of the hydrogen set free by the reaction. If, therefore, in the manufacture of the so-called tinplate, which is sheet iron or steel covered with a layer of metallic tin, there be imperfections or pinholes in the tin coating, these channels through the tin to the iron will become centres of corrosion which rapidly destroy the plate. It is impossible to detect these imperfections by a simple inspection, and hence users of tinplate have been unable to test the quality of their raw material from this point of view. Since the iron must pass into solution at these exposed points in the tin coating, their presence may be easily located by flowing upon the tin surface a solution of gelatine or glue in which is dissolved some potassium ferricyanide. When the jelly has stiffened the iron will pass into solution through the holes in the tin and, reacting with the ferricyanide, will leave a bright blue spot in the jelly. Variations in the quality of tinplate may thus be easily detected.

The author has already shown* that "mill scale" or magnetic oxide of iron is strongly electro-negative to iron. Since mill scale is insoluble in water and cannot of itself enter into the reaction, its only function must be analogous to that of platinum or other insoluble conductor of this kind, viz., to furnish a surface on which the hydrogen liberated by the dissolving iron can separate and be catalytically oxidised to water again. This is also true of the black oxide protective coatings sometimes used upon iron and steel, as, for example, that of the Bower-Barff process. Just as is the case in mill scale, these coatings are very serviceable so long as the whole coating is intact. But so soon as a portion of the metallic iron is exposed, this portion corrodes all the more rapidly on account of the presence of the surface of scale on which the oxidation of the hydrogen and consequent depolarisation can go on.

Many more examples of the application of the electrolytic theory to problems of corrosion could be given, but these will suffice to make clear the general applicability of the theory, and its usefulness in the investigation of a subject of such fundamental importance to manufacturers and users of iron and steel.

* *Journal of the American Chemical Society*, 1907, p. 1259.

THE NATIONAL PORTRAIT GALLERY.

THE Trustees of the National Portrait Gallery in their fifty-second annual report state they are glad to be able to report that arrangements have been made with them by the First Commissioner of His Majesty's Works whereby a piece of land to the west of the Gallery, forming part of the site at present occupied by St. George's Barracks, has been definitely allotted to an extension of the National Portrait Gallery, as soon as the site shall have been vacated by the military authorities and the buildings at present occupying the site removed.

The Trustees look forward eagerly to this long-needed extension of the National Portrait Gallery, and express their hope that in the actual disposition of the site in question between this Gallery and the National Gallery an opportunity may arise for the simplification of certain complications in the construction of the National Portrait Gallery which at present give rise to unnecessary trouble and expense.

The list of 817 donations, loans, or bequests, as given in the former reports, may now be continued up to 835. Among them are Frederick Walker, A.R.A. (1840-75), painted in water-colours by himself; William Makepeace Thackeray (1811-63), a plaster cast from a mould of his face and right hand taken after death by Messrs. D. Brucciani & Co., and by whom it is presented; Benjamin Robert Haydon (1786-1846), the historical painter, drawn in pencil by Sir David Wilkie, R.A.; Sir Thomas Lawrence, P.R.A. (1769-1830), a bronze cast by S. Parker, after a medallion by E. H. Baily; Sir John Everett Millais, P.R.A. (1829-96), a plaster cast from a statuette modelled in 1863 by Sir J. E. Boehm, R.A.; and Dante Gabriel Rossetti (1828-82), a facsimile reproduction of a drawing by Simeon Solomon.

The number of purchases now amounts to 758. The twenty bought during the past year include a pencil sketch of Alfred Stevens made by himself when a student at Rome, and a painting of Matthew Boulton, F.R.S. (1728-1809), the eminent engineer and founder of the famous Soho Works at Birmingham, 1762, and who as partner of James Watt completed with him the invention of the steam-engine as an instrument of practical utility.

The number of portraits now on the register in the collection is 1,536, exclusive of engravings, photographs and other portraits of a supplementary nature, which bring the total number of portraits actually exhibited to 1,734.

In response to what was evidently a demand on the part of the public, the Trustees of the National Portrait Gallery say they have willingly agreed to a proposal that the Gallery should be opened to the public on Sunday afternoons throughout the year. At the same time the Trustees desire to record their opinion that in the absence of any artificial light in the Galleries the amount of light for the inspection of pictures and works of art on winter afternoons is very scanty, and hardly seems to justify the expense of opening the Gallery. The Trustees have communicated to His Majesty's Treasury their willingness that artificial light should be introduced into the exhibition galleries, but have received an unfavourable reply.

Owing to lack of funds for the payment of the staff, the Trustees were unable to open the National Portrait Gallery on Sunday afternoons from November 1908 to March 1909 inclusive. The Gallery will, however, in future, be opened to the public on Sunday afternoons throughout the year at the following hours:—January, February, November, December (light permitting), 2 P.M. to 4 P.M.; March to October, 2.30 P.M. to 5.30 P.M.

The total number of visitors admitted on Sunday afternoons during the summer of 1908 (April to October) was 13,306, giving an average of 443 per Sunday.

The number of visitors admitted to the National Portrait Gallery during the year 1908 amounted to 164,981. The total is made up as follows:—Visitors admitted free of charge on week days, 141,006; visitors admitted on payment of 6*d*., 10,669; visitors admitted on Sunday afternoons, 13,306.

For the three months January 1 to March 31, 1909, the total number of visitors was 26,909, of which number 1,495 were admitted on payment of 6*d*.

The total number of visitors admitted to the National Portrait Gallery since the opening of the new building in St. Martin's Place on April 4, 1896, to March 31, 1909, is 1,824,913.

THE LAYING OUT OF NEW STREETS.*

THERE has been much controversy as to whether the erection of buildings at the side of an existing road amounts to the laying out of a new street within the meaning of the by-laws usually in force in both rural and urban districts. All the cases which have been before the courts seem to lay it down that it is possible for an old highway to become a new street, but no rule is laid down to clearly define when such highway does in fact become a "new street," and the controversy cannot or will not be determined until fresh legislation definitely settles the point for us. All we can get from the decisions is, that the question is purely one of fact whether the building owner who is building on land abutting on a highway is making or laying out a new street. The decisions up to 1900 are clearly discussed in a leading article in Vol. 64 of the "Justice of the Peace," pp. 577 and 593. The Devonport case ("Devonport Corporation *v.* Tozer," 1903), some writers appear to think, has overthrown the doctrine that when a building owner erects houses by the side of an old lane he may be held to be laying out a new street, whilst others are of opinion that the question is one of fact for the Justices to determine in every particular case, a position of affairs which cannot be considered satisfactory by any means as the views and decisions of magistrates may be as widely different as the poles, especially where landowners constitute the majority of the bench.

It must not be forgotten by local authorities, if they take proceedings before Justices, that it may possibly be held that the road which the local authority declares to be a "new street" is already a "street." The precise moment therefore when a highway becomes a "new street" is most difficult to determine, and it is too much to hope for or expect a bench of county magistrates to see eye to eye with a local authority in this class of case.

The object of this short paper is to draw the attention of the Conference to a case in which the Leigh Rural District Council has recently been involved (simply as an illustration of what local authorities have to contend with and to make

* A paper read by Mr. E. Williams, clerk to the Leigh Rural District Council, at the annual conference of the Rural District Councils' Association last week.

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clear the point I am raising), and to ask the Association to support the following resolution submitted by my Council and adopted by the Parliamentary Committee of the Executive Council of the Rural District Councils' Association:—

Resolution:—

"Resolved, on the motion of Mr. Battersby, seconded by Mr. Prescott, that the Local Government Board be urged to immediately promote legislation which shall provide that in all cases where a landowner lays out land for building purposes abutting on an existing highway, the local authority may require such highway to be widened by the landowner to the width prescribed by the bye-laws of such authority for new streets and buildings."

The facts of the Leigh Rural District Council v. B. case are as follows:—

On December 7, 1907, B. submitted to the Council's surveyor draft plans of a house and shop he intended to build on an existing highway. He was informed by the surveyor before complete plans were submitted that the Council would require him to add a strip of land fronting his proposed buildings to the highway, so as to provide for a 36-feet street in accordance with the Council's bye-laws. The surveyor had informed B. that in consequence of the number of buildings which had been erected on the opposite side of the road to the proposed premises (about forty in number), the Council would deem the lane or highway to be a "new street." This was a wise step to take, as B.'s was the first house to be built on the west side of the lane. B. submitted complete plans to the Council, with the following note endorsed thereon:—

"Note.—The new street line to be 18 feet from the present centre of X—— Lane as shown on plan, and marked proposed new fence line. The strip coloured brown between the present and proposed lines to be given to the roadway so as to provide for the half of a 36-feet street as required by the bye-laws."

The Council approved the plans, and B. erected his house and shop, but when he erected his fence wall he ignored the arrangement made with the Council and built the fence wall upon the old line of fence and enclosed the strip coloured brown. Proceedings were taken against B. for contravening the Council's bye-laws by erecting the "building" without depositing a plan showing the position of the wall, and contravening the bye-laws as to new streets. The case was partly heard by the Justices when a compromise was agreed upon on the following terms:—The Council to pay B. 5*l.* towards his costs (which must have been very considerable), and to rebuild his wall (which cost the Council 6*l.*) on the new fence line; B. to give the land coloured brown, and to admit that he was laying out a new street.

Thus ended a case which might have involved both parties in heavy costs. Similar cases will undoubtedly crop up again and again, and it is advisable that local authorities should bestir themselves to see that legislation is promoted to obviate the difficulties above referred to.

My Council have raised the question as to whether a bye-law could not be framed under Section 157 of the Public Health Act, 1875, to meet such cases, but the Local Government Board in a letter dated October 1, 1908, state "that it is beyond the scope of the bye-laws to determine when an existing highway becomes a new street. This would be a question of fact to be decided by the Justices according to the circumstances of each case." From this it would appear that until the legislature deals with the point, local authorities must fight each case on its merits, and probably spend large sums before they get a decision. Why a landowner should be compelled to make an entirely new street 36 feet wide and yet be allowed to build along an existing highway without any question being raised as to the width of the road, passes all understanding, and is quite unreasonable. It is absolutely essential that we should have wide roads to cope with the ever-increasing motor and other traffic, and it is for local authorities to see that roads in their districts are not crippled in width by landowners erecting or permitting buildings to be erected along existing fence lines in narrow lanes. Why should they not be compelled to widen a highway to a width prescribed by a bye-law? The condition of our roads has been considerably improved at the expense of the ratepayers, and the value of land abutting on them has been greatly enhanced for building purposes, yet local authorities, if they desire to widen an existing highway, must pay a "building land price" for the land they require to carry out such widening. Why should not the betterment system be adopted in such cases, or at the least the requisite land for widening the highway be given up by the landowner?

The question now is what shall local authorities do under existing conditions.

There appear to be only two ways in which to act: the first way is, to ask the building owner to convey to the Council the land required for widening to the roadway, before approving his plans of new buildings; and the second is, if he declines to convey the land, to refuse, on the authority of "Smith v. Chorley Rural District Council," to pass or sanction his plans and let him take whatever proceedings he may think fit.

If the building owner decides to erect buildings without the approval of his plans, the Council's remedy will be to take proceedings for the enforcement of the bye-law alleged to have been infringed. This line of action will in most instances restrain the building owner from proceeding with his building, and the landowner, who is the real sinner, will come to terms with the local authority.

It is a wise (and reasonable) plan to give notice to landowners when the local authority consider an existing highway in their district is taking the form of a new street. Much trouble and possibly litigation may be avoided thereby. Such, at any rate, is my experience.

The following is an extract from a private Act:—

"29. (1) When a road or lane within the borough becomes in consequence of building operations a new street within the meaning of the Public Health Act, 1875, but the land on only one side of such street has been or is in course of being built on, the Corporation may, instead of requiring the owner of the land built on, or in course of being built on, to widen such road or lane to a width prescribed by the bye-laws in force in the borough, require such owner to widen such road or lane so as to give a width not less than one-half of such prescribed width from the old centre line of such road or lane to the boundary thereof adjoining such land.

"(2) Provided that if and when the land on the opposite side of such road or lane shall be built on the Corporation shall require the owner of such land to complete the widening of such road or lane so as to give the complete width prescribed by the bye-laws of the Corporation."

It will be seen that some attempt has been made by a Corporation to ensure the widening of existing highways, but the all-important question under this clause is, "When does a road or lane become, in consequence of building operations, a new street?" Even this Corporation, with its Private Act, is precious little nearer the real root of the trouble than rural district councils are, and I submit it is only right and just that local authorities should themselves have the power to say that a road or lane shall be widened by the landowner to the width required by the bye-laws whenever he builds or lets land for building purposes along such road or lane.

It also seems desirable that County Councils should be empowered to make bye-laws with respect to the width of main and secondary roads where building operations are contemplated, so as to ensure that such roads are constructed of a uniform width, in view of the fact that the requirements as to the width of new streets under the bye-laws of various local authorities differ, and that even in adjoining districts.

I propose the resolution submitted by my Council to the Association.

GAS HEATING RESEARCH.*

Introduction.

WHEN coal gas is burned in an enclosed space, the amount of heat † communicated to that space depends only on the chemical composition of the gas and the amount of it that is burned, provided that in the end it is burned completely to carbon dioxide and water. No mechanical contrivance can increase the total output of heat.

If we suppose the gas to be burned in a naked flame, the heat is delivered to the surrounding space in three ways. In the first place, the hot products of combustion stream upwards, intermingling with the air, warming it and any surfaces with which they come in contact. In the second place, a certain amount of air is warmed by contact with the flame; and this also carries away heat. Heat distributed by hot currents of gases is said to be convected. In the third place, the flame parts with some of its heat by emitting rays through the air in every direction on to the

* Extract from report of the Gas Heating Research Committee appointed by the Institution of Gas Engineers in conjunction with the University of Leeds, and consisting of Messrs. John Bond, J. H. Brearley, and Charles Wood, in co-operation with Professors Arthur Smithells (Chairman), William A. Bone, and Julius B. Cohen, of the University of Leeds, and Mr. E. W. Smith (Research Chemist), to the Institution of Gas Engineers, at their Annual Meeting held in London during June 1909.

† To ensure clearness the word "heat" is used here, although it would be more scientifically accurate to substitute "energy."

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objects in the room. Heat distributed in this way is said to be radiated.

If the utility of an appliance for heating by gas depended solely on the amount of heat that was given out, a simple burner giving a naked flame, whether luminous or atmospheric, would be as effective as any other appliance. But the utility of a gas-heating appliance such as a gas-stove must be considered in regard to a number of practical questions:—

1. If, for example, we desire not to introduce the products of combustion into the space we are heating, we must provide the stove with a flue sufficiently large to carry off these products. The flue may be so arranged as to its length and the conductivity of its material that it will drain off most of the heat of the gases passing through; so that if the flue, before opening into the outside air, is wound about inside the space that is being heated, the products of combustion may be got rid of without taking much heat with them.

2. Again, we may desire to avoid very hot currents of air, which rise at once to the ceiling; and in that case, instead of using a naked flame, we should cause it and its products to heat up metallic surfaces of some considerable extent. These heated surfaces would then cause much cooler and broader and more slowly moving upward currents of air, which would set up a more general circulation in the room.

3. We might desire to obtain as much heat as possible in the form of radiant energy sensible as heat. In that case we should cause the flame and its products to heat up some material of such a kind and in such a way that it drained a very large quantity of heat from the flame and emitted it again in the form of radiation.

4. Lastly, it may be supposed that a gas-stove is desired not only to heat, but to ventilate, a room. In that case it will have to be so used as to eject air in addition to its own products of combustion.

Other considerations might be named, but these are sufficient to emphasise the chief points that have to be considered in regard to the heating efficiency of gas-stoves. And gas-stoves might be relegated to one or other of three categories according as they heated a room mainly: (1) by direct diffusion of hot products of combustion, (2) by heating surfaces which caused convection currents of warm air, (3) by radiation. Stoves of the first type are to be found in the "reflecting stoves," which are not infrequently used to take the chill off the air of shops. Stoves of the second type include "radiators," "steam radiators," and "condensing" stoves. The use, or rather the misuse, of the word "radiator" in this connection is based on a similar misuse which has become common in connection with steam or hot-water heating coils. These appliances would be more correctly called "convectors," as their heat is almost entirely delivered by warming the surrounding air and so causing convection currents. Stoves of the third type include the normal gas-stove, where atmospheric flames are caused to heat up a refractory fuel to the highest possible temperature. Of course there are stoves of intermediate type, in which more than one of these methods plays an important part.

There can be no doubt that the form of heating most acceptable to the Englishman in a living room is radiation from a bright fire, and it is in the comparison of the brightness and radiant warmth of coal-fires and gas-fires that gas-fires (apart from questions of cost) are commonly disparaged. There is also a very widespread and deeply rooted belief that a gas-fire, even if satisfactory as a radiator, is necessarily attended by some hygienic disadvantage.

In taking up the study of gas-heating appliances and endeavouring to gain an accurate estimate of their efficiency, the Committee felt that they might best begin with a study of the radiating efficiency of gas-stoves, including, incidentally, a study of the hygienic conditions. If the radiating efficiency of gas-stoves can be materially improved, and if it can be shown that a gas-stove, when properly constructed and used, has no more deleterious influence than a coal-fire, a great advance will have been made towards the substitution of gaseous for solid fuel as a means of domestic heating. In the following report will be found details of the measurements of radiation from one of the prevailing types of gas-stove with fire-clay fuël. These measurements, it is believed, have been made with as much accuracy as is at present possible, and give for the first time a tolerably correct absolute measurement of the radiating power of a gas-stove.

Open Gas Fires, by E. W. SMITH, M.Sc.

This included the determination of:—(*a*) The total energy radiated as heat from the stove. (*b*) The effect on the radiation of changes in the volume of air passing through the room and up the flue. (*c*) The extent of the so-called "drying" of the room air where open gas-fires are used. (*d*) The extent of the vitiation of the room air caused by open gas-fires. (*e*) The amount of heat passing directly up the flue and not available for heating the room. (*f*) The amount of carbon dioxide found (1) in the room and (2) in the flue. (*g*) The amount of heat used in heating the air of the room. (*h*) The volume of air that might be raised from 45 degs. to 60 degs. Fahr. by the heat available in the stove. (*i*) The effect of using a reflector. (*j*) The effect on the heat lost to the room, of changes in the volume of air passing up the flue.

Description of the Experimenting Room.—It was very necessary in connection with this work that the varying conditions to be coped with should be completely under control. For this purpose a special chamber was built in one of the rooms of Woodhouse Lodge—a building adjacent to the Fuel Department of the University of Leeds. It consisted of a double-walled room built of tongued and grooved boards, the inner and outer walls being about 2½ inches apart. These were made as nearly as possible air-tight by lining the inside walls with calico, coated with asbestos paint, and the outside walls with a thin coating of pitch. The floor, which had to bear the weight of the stoves, &c., consisted of a layer of tongued and grooved boards made air-tight with painted calico. Over these asbestos board was laid, and on the top of this a sheet of asbestos-magnesia cement.

(*To be continued.*)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* continues its illustrations of the architecture of the Southern States with examples of schools at Atlanta, Georgia and Manning, South Carolina. It also contains a number of specimens of students' designs for the Society of Beaux-Arts architects.

La Construction Moderne illustrates a modern French country house, Cashel Bénerville, near Deauville, Calvados, a stone and half-timber house, with steep-pitched hipped and dormered tiled roofs. The architect is M. H. Goury. We may be prejudiced, but we prefer the country houses of our own native architects.

Deutsche Bauzeitung illustrates and describes the new Catholic parish church at Spandau, of which Professor Christoph Hehl of Charlottenburg is the architect, which both in plan and detail is based upon the national German Romanesque or round-arched Gothic. The chief feature of the plan is the decagonal central area surmounted by a dome, and from which project apses, transepts and short nave.

Dekorative Kunst illustrates a country house at Kruman, of which Herr Victor Kafka, of Prague, is the architect, which has some attractive points in its planning and grouping, and is treated with charming simplicity in its internal detail. A special feature of this issue is the work of two ladies, Clara Paster and Marie Sturm, in necklaces of old Venetian glass beads.

The *Engineering Record* (New York) is chiefly occupied with the proceedings of the American Waterworks Association, abstracts being given of papers read at the recent Milwaukee Convention of that body.

COMPETITION RESULTS.

THE successful architects in the competitions held for the two new schools about to be erected by Govan School Board, N.B., are:—For Hyndland School, Mr. H. E. Clifford, and for the Craigton School, Messrs. Watson & Salmond. The architects to whom premiums have been awarded are:—For the Hyndland School, Messrs. J. Thomson & R. D. Sandilands, Mr. William B. Whitie, and Mr. Alexander N. Knox; and for the Craigton School, Mr. H. E. Clifford, Mr. John Hamilton, and Mr. J. Gibb Morton.

NOTABILIA.

THE *Connoisseur* continues the account of the City and County of York, by Leonard Willoughby, the history of the city being sketched and various treasures of the Minster and the Mansion House being illustrated. An interesting feature is the series of illustrations of the Corporation plate of the city of York. Haldane Macfall continues the account of early Georgian furniture of "the years of mahogany."

The *Burlington Magazine* has a finely illustrated article showing some very remarkable examples of goldsmiths' work from the collection of drinking horns and silver plate in the National Museum at Copenhagen.

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The *Art Journal* continues the series of articles by R. Ll. B. Rathbone on "The Artistic Training of a Jeweller," in which good principles are illustrated by reference to Anglo-Saxon, Byzantine and ancient Roman work. Kew Gardens and its architecture is described and illustrated by a number of excellent pencil drawings by Edward C. Clifford, R.I.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Influence of Material.

SIR,—As the idea of applying geometry to architectural design has been for long a vexed question, perhaps you will allow me space for a few remarks in reply to Mr. Percy L. Marks's letter, at least that part of it with which I have to do.

I do not suppose any architect would be so unwise as to found his design solely on a basis of geometry. He may use it as a corrective, but not as a substitute for imagination, which must hold the first place. And this is what I presume the architect of the Parthenon did, first putting his design together out of the accumulated material of his past, allowing refined imagination full play, and then correcting it by the application of geometry. Imagination and reason should work together in determining design. Imagination alone may lead to eccentricity, reason alone to uninspiration.

Mr. Marks states that if other Grecian buildings are examined, different proportions are found, and still they are good architecture. That is quite true. The Erechtheum is outlined by angles of 60° and 30°, and as instances of differently arranged schemes of 45° and 22½° triangulation there are the little temple of Nikè Apteros and the exquisite monument of Lysicrates which is so outlined from finial to base. But these instances do not invalidate my argument about the Parthenon, which, when compared with similar buildings of its style, holds the field for beauty of proportion; and if its architect did not avail himself of any geometrical system of revision, the result of the application as shown in my diagram is a remarkable instance of coincidences.

What special value these angles possess I cannot tell. It is a fact, however, that the equilateral triangle largely determined much Mediæval work, and it is reasonable to suppose that a similar system was employed in Classic work.

An architect cannot run riot in his design and succeed. He must submit to law as other creators of art have to do.

This theory of the part played by geometry is strengthened by the method that was apparently employed to fix the diameters of columns both Classic and Mediæval, as shown in the diagram.

If this also be the result of accident, then here we have another remarkable coincidence which fails to be accounted for.—I am, faithfully yours, G. S. AITKEN.

Edinburgh: July 5, 1909.

"The Arts Connected with Building."

SIR,—I have just noticed your review of "The Arts connected with Building" in to-day's issue of your paper, and desire to thank you for the same. I however hasten to point out that the illustrations were added in the book at the special wish of Mr. Raffles Davison and myself, and this is mentioned in the second paragraph of the third page of Mr. Davison's introductory note. It was generally the wish of the lecturers that their work should not be illustrated, but it seemed to Mr. Davison and me only right that the public should realise that the lecturers had carried into practice the principles they had laid down.—I am, yours faithfully, B. T. BATSFORD.

94 High Holborn, London: July 2, 1909.

Guild of Architects' Assistants.

SIR,—Having reference to the leaderette in your current number *re* the Guild of Architects' Assistants, would you kindly allow me some space to comment upon the same as a member of the Committee of the above Guild?

The article in question starts by asserting that "the Guild of Architects' Assistants is the result rather of the development of the practice of young architects of the present day of spending their whole life as assistants rather than as attempting to make an independent position as principals." In that particular may I point out that the present position of young architects is much more complicated than of former days, say, when our grandfathers were in practice for themselves. Competition in all forms is greater now than then, and together with the increased facilities for a scanty architectural education which enables a poorer class of men to style themselves architects, some of which turn out to be good assistants, and some, where the opportunities occur, if they have the business qualities more strongly marked may find themselves in the position of employing some of their less fortunate colleagues who may or may not be fairly treated, which makes the relation of principal to assistant become more and more acute. Consequently the assistants, realising that their chances of becoming principals are becoming more and more remote, and the possibility of unscrupulous men being able to call themselves architects becoming more and more a fact and a degradation to Art, have seen the necessity of forming a guild for the protection of assistants, and the furtherance of architecture as an art, much in the same manner as principals have felt the necessity of forming institutions to aid them in questions relating to differences that might occur between the architect and his employer, euphemistically called the client.

It is certainly easy to get assistants that will take thirty shillings a week, but there is no doubt that some if properly treated would be worth much more, for many architects fail to get the best out of their assistants by not offering them any hope or interest in their profession. Therefore it is hoped that by the influence of the Guild through the power of combination and the sympathy of practising gentlemen to enrol a superior class who, if they could not practice entirely for themselves, would make good managing assistants.

If the Guild can attain this it will certainly benefit both principal and assistant, and we are told at the end of the leaderette that "they will find that employers will be only too ready to give berths to this class and treat them fairly and generously as permanent members of their staff"; but this assertion does seem a little optimistic, for firstly, we must assume that the architects in question are not going to suffer by the increasing competition so as to interfere with their permanent supply of work, and secondly, that owing to the decreasing competition between assistants that principals will not be able to get good men at a less wage.

It has now become clear that unless a better understanding between principal and assistant is made that the position for both will become worse for the profession at large.

I venture to suggest that when the Guild has become sufficiently felt so as to improve the present educational position of architects, that something in the nature of co-partnership should come to their consideration as a solution to the outcry of those principals who say that they cannot get a good managing assistant worth 5*l.* per week.—I am, yours faithfully, HERBERT COX.

10 Mecklenburgh Street, Mecklenburgh Square, London, W.C.

P.S.—The Secretary of the Guild is E. J. Dixon, Esq., A.R.I.B.A., 60 Idmiston Road, Stratford, London, E.

July 6, 1909.

GENERAL.

The Bill promoted by the Institute of Architects of the Transvaal and supported by the Society of Architects providing for the registration of architects has passed both Houses of the Legislature of the Transvaal.

The Adjourned Special General Meeting of the Royal Institute of British Architects for the consideration of the revised by-laws, for the announcement of the results of the poll, and for the confirmation of the premises resolution, announced to be held Thursday, July 15, is postponed. Notice of the date of holding the meeting will be issued to members within a few days.

The British Fire Prevention Committee have continued their series of fire tests with doors by testing a large roller shutter to a 7-foot opening, the temperatures ranging up to 1,800 deg. F., followed by the application of water from a steam fire engine, the test lasting for 2½ hours. The members and visitors were received by Mr. Edwin O. Sachs, F.R.S.Ed. (chairman), Mr. Percy Collins, J.P., and other members of the Council and executive, and there were present among others the representatives of nearly all the Government departments concerned, as also a number of municipal officials. The report on the test will be issued in due course by the committee. The testing arrangements of the afternoon were in charge of a sub-committee comprising Mr. Ellis Marsland (directing member), Mr. J. Herbert Dyer, Mr. Fulkes, and others.

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The Architect.

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FORTHCOMING EVENTS.

Friday, July 16.

Architectural Association. Exhibition of work done in the School of Architecture, and Award of Prizes, 3 P.M.–6.30.

Saturday, July 17.

Bristol Society of Antiquaries visit Malmesbury and neighbourhood.
Society of Architects. Students' Sketching Excursion to Merstham and neighbourhood.
Leeds Health Congress, organised by the City and University of Leeds with the co-operation of the Royal Sanitary Institute and the Royal Institute of Public Health, July 17 to July 24.

Wednesday, July 21.

Egypt Exploration Fund: Lecture on the recent discoveries at Abydos and Mahasna, by Mr. E. R. Ayrton, at King's College, 160 Strand.

Thursday, July 22.

Society of Architects' visit to Messrs. Thomas Lawrence & Sons, works, Bracknell, Berks.

Friday, July 23.

Royal Archæological Institute. Annual Meeting at Lincoln, July 23 to July 30.

Saturday, July 24.

Architectural Association. Third Summer Visit to "Ardenrun," near Godstone, Surrey (a house by Mr. Ernest Newton).

SCHOOLS FOR ARCHITECTS.—I.

THE ROYAL ACADEMY.

THE Royal Academy of Arts does not exist only to furnish for the enlightenment or amusement of the public annual exhibitions of executed works by artists, present and past, nor to mark a high level of achievement by enrolment amongst its membership; it provides also instruction for art students of a very high quality, and that gratuitously. The architectural school, with which we are immediately concerned, is not for the tyro, but is open to all students of architecture sufficiently advanced to be able to profit by the instruction given, without limitation of age, creed, or nationality, and the object of the instruction is to educate the student in the most important of all the qualifications essential to an architect, the ability to design architecture. Design, and design only, is then the subject of study in the architectural school of the Royal Academy.

Although there is now no limitation of age for the architectural student desirous of entering the Royal Academy school, the best age at which to commence work therein is about twenty-one or twenty-two. The average student has at that age attained sufficient proficiency in draughtsmanship and adequate knowledge of construction and of the architectural work of the past to fit him for taking the fullest advantage of the opportunities that the Royal Academy offers. By entering at the age of twenty-one or twenty-two the Royal Academy student may hope also to gain one of the valuable travelling studentships at that period of his career when the opportunity for extended travel and study of old work would be most beneficial to him.

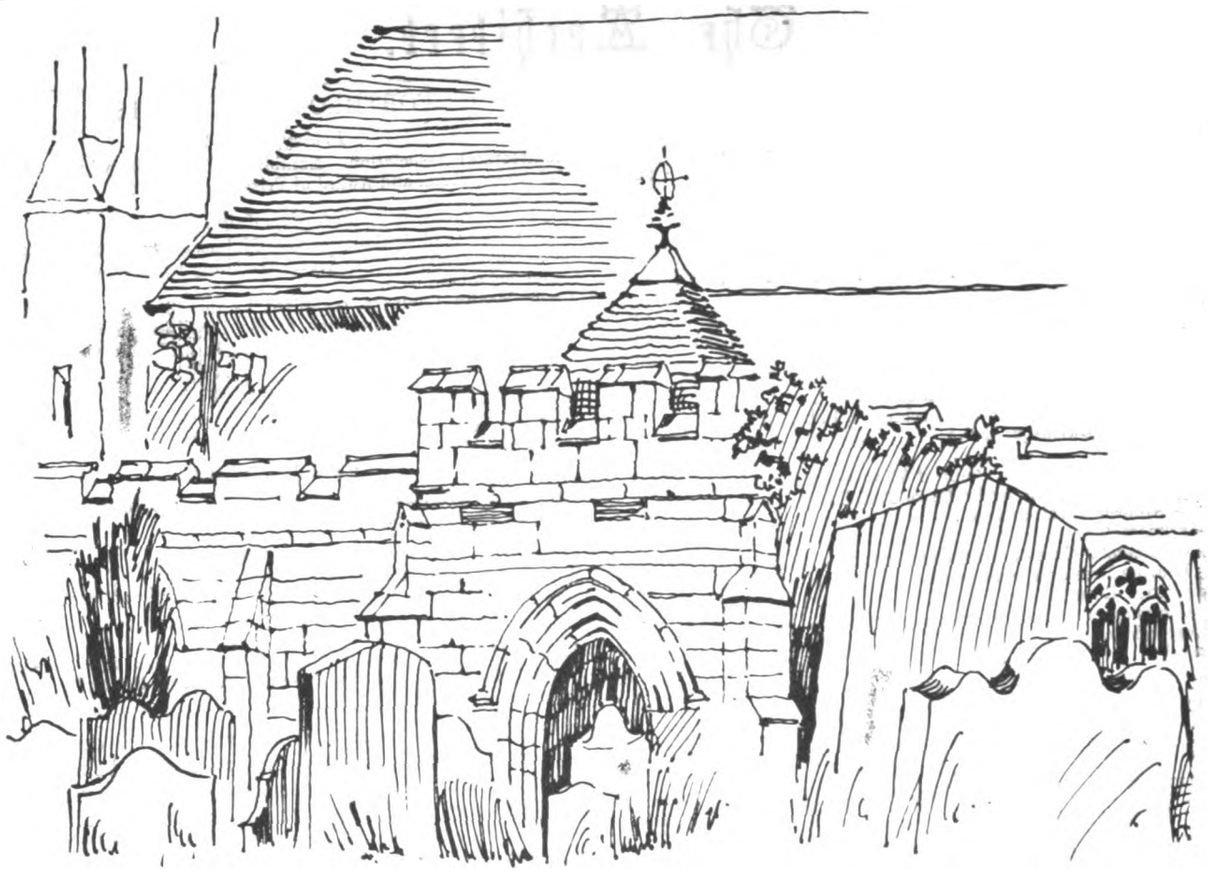
In order to gain admission to the Royal Academy school a student must prove that he has learnt to draw, and for that purpose must submit (1) a measured drawing (plan, sections, and elevation) from his own notes and measurements, with his original notes; (2) drawings of each of the three classical orders, the columns being 12 inches high on the paper; (3) an original perspective sketch; (4) a shaded drawing from a cast.

When these drawings are approved the student is admitted as a probationer, and as such is required to produce further drawings in the school by way of examination. For this purpose he has to make (1) a drawing from memory of one of the orders to half-inch scale, in two hours; (2) a shaded drawing from a cast, the same size as the original, in five hours; (3) the plan and elevation of a building from his own notes, the notes being also submitted, four hours; (4) an architectural design for a subject selected by the visitor for the time being, twelve hours. The probationer has also to pass an examination in the history of architecture and in perspective. Having passed his examination, the probationer is admitted as a student for a period of three years, and is then fairly launched on his career through the Royal Academy school.

It should be noted that the entrance examination is in no sense competitive, but qualitative, inasmuch as that, at present at any rate, the number of qualified entrants in each year does not exceed the number of places vacant. It might, of course, happen that more students might desire admission than the Royal Academy could accommodate, and in such a case the entrance examination would become competitive, but we believe the desire of the Council is to augment rather than to restrict the number of students in the architectural school, so that it would be only sheer necessity that would compel them to exclude any properly qualified student. But, as we have already said, the Royal Academy school is not for the tyro, so that the standard of draughtsmanship required is by no means low, though it is, on the other hand, not unduly high for those serious and able students who have reached the desirable age of entry.

The school year extends from October 1 to the end of the following July, and is divided into four terms, during each of which it is under the direction of one of the four distinguished architects who act as visitors, and who are at present Mr. T. G. JACKSON, R.A., Sir ASTON WEBB, R.A., Mr. JOHN BELCHER, R.A., and Mr. REGINALD BLOMFIELD, A.R.A. These visitors make a practice of attending one evening in each week during the term in which the school is under their direction. They set the subjects for design, and criticise, in the true sense of the word, the work of the students—that is, their criticism is not destructive or carping, but suggestive. In our inspection of the work done by the students under the direction of the present visitors, we were struck by the absence of any attempt on the part of the students to follow the manner of the particular visitor under whom they were working, showing that there is no danger or probability of a student's individuality being warped or crushed by academic instruction. It is, in fact, quite impossible to guess from the treatment of the designs who the visitor might be that superintended their production. Besides the four members of the Academy who act as visitors, students have the advantage of the guidance and instruction of a master of the architectural school, Mr. C. DE

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SOUTH PORCH, BATTLE CHURCH, SUSSEX.—FROM A SKETCH BY BANISTER FLETCHER.

GRUCHY, a gentleman who has made his mark as one of the finest architectural draughtsmen of his day, and who is in attendance on every evening that the school is open.

Design is taught by the method of preparing a set of drawings, completely worked out, for one subject in each term, and besides drawings, students are encouraged to sketch out their designs in the solid by modelling them in clay, thus cultivating the faculty, so necessary to the real and capable architect, of thinking in three dimensions. Modelling of carved ornament from their own designs is also allowed to the students, and we have seen some very capable work in this direction. We think this branch of study might be further extended, and the students encouraged to model from each other's drawings, as well as to make drawings from each other's models. In this way they would learn one of the most difficult accomplishments of an architect, the representation in a drawing of carved ornament so as to adequately convey to a craftsman the intention of the designer.

Every student in the Academy school is encouraged to keep before him the goal of a travelling studentship, of which there are two, offered in alternate years, the one for travel in England and the other, carrying with it also the gold medal, for travel abroad. In order to qualify as a competitor for these prizes, the probationer who has been admitted as a student is required to do a certain minimum of work in each of the three years through which his membership of the school extends. During his first year he has to make three designs, one of which he must submit in competition for a 15*l.* premium. During this year he is also required to attend three courses of lectures (in all about twelve or fourteen) on painting, sculpture, and architecture respectively. One of the weak points of the Academy system is this question of lectures. Attendance only is necessary, and a student is not required in any way to show that he has benefited by the attendance. The lectures, which for the most part make excellent reading, have not always been delivered in such a manner as to make them readily comprehensible to the attendants, we cannot say listeners. Both lecturers and students seem to be obsessed with the feeling that delivery on the one part and attendance on the other are all that are required. The time at which the lectures are delivered is also not very convenient to young architects, who at the age of attendance at the Academy school are usually paid assistants, earning their living in the offices of employers whose business is apt to be somewhat disorganised by the attendance at lectures. Another weak point of the Academy system is the short time in each evening for which the school is open, two hours from 6 to 8 P.M. Out of this two hours the time required for preparation and settling down and for packing up has to be taken, so that the net time possible for steady work is quite small. Few students either work or live next door to the Academy, so that when the time of travelling to and from the school is added, the result is that an architectural student spends some 3½ or 4 hours in an evening for not more than 1½ hours solid work.

Having complied with the stipulations for his first year's work, our student aims in his second year at competing for the 25*l.* premium by submitting one of at least five complete designs prepared during the two years. Thus in this period the student may, if industrious, have completed eight designs; but he must have completed five in order to be eligible as a competitor for the 25*l.* premium. Similarly by the end of his third year he may have made twelve designs but must have completed six, if he desires to compete for a travelling studentship. Thus having during his three years studentship attended the lectures, completed six designs, and competed for the premium of 15*l.* in his first year, and of 25*l.* in his second year, not necessarily successfully, the student may apply to the Council for permission to compete for a travelling studentship, this permission being almost invariably granted.

At the end of his three years' studentship a student may apply to the Council for permission to renew his studentship for a further period of two years, to obtain which he must have completed seven designs, have attended the lectures, and must submit three of the designs done in the school.

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The extension is usually granted, and the student then has further opportunities of competing for the travelling studentships.

The drawings for the travelling studentships and gold medal are not made in the school, but in the student's own home or office, and, in addition to the studentships and the premiums already mentioned, there are prizes open to him for modelling, colour decoration, perspective, and measured drawings.

Thus it will be seen that the advantages offered by the Royal Academy in its architectural school are very great and valuable—gratuitous instruction of the highest possible quality in design, sympathetic encouragement of the development of personal individuality and ability, many and valuable prizes, and the companionship of the crème de la crème of a student's contemporaries.

NOTES AND COMMENTS.

THE decision of the Select Committee of the House of Commons that had under consideration the provisions of Part V. of the London County Council (General Powers) Bill, in finding the preamble of the Bill proved, practically ensures the proposed modification of the thicknesses of external walls in the case of steel framed buildings, but is a slap in the face of the Council of the Royal Institute of British Architects, whose opposition to the proposal of the County Council to make regulations respecting the internal structure is swept away. As we have said before, we cannot see that the external parts of a steel frame structure can be considered and judged as to their adequacy or otherwise without reference to the internal framework to which they are connected, and by which they are in part supported. The question of appeal seems to be a little complicated, and to our mind illogical as now arranged by the Committee. Why an appeal from the decision of a district surveyor should be made to a police magistrate, except for the sake of analogy with other procedure under the London Building Act, and an appeal against a decision of the County Council relating to modifications of Clause 30 of the Bill should be made to the Tribunal of Appeal, we are unable to understand, inasmuch as in both cases the appeal is likely to be upon points of scientific construction rather than of law.

THE letter in our correspondence column on the subject of the Middlesbrough Library Competition shows once more the weakness of the single-assessor system of deciding competitions, and also how strongly is maintained in the present government of the Royal Institute "the right divine of kings to govern wrong." When an assessor has been appointed, has made his award, and his award has been accepted by the promoters, it has been proved repeatedly that even if the assessor makes a flagrantly unjust or incorrect award, the position of the aggrieved competitors is practically hopeless, though we hope that this will not prevent the competitors in this particular instance from taking counsel's opinion, and, if necessary, testing the point in a court of law. It is really a very important question for the many architects who take part in competitions whether a wrongful decision of an assessor is binding upon everybody in any event, and in our opinion it would be quite justifiable for the Committee of Defence of the Royal Institute to arrange, and the Council to sanction, a friendly action as a test case on the legal aspect of the question. We are perfectly aware that under the present government of the Royal Institute such a thing is incredible, and that the aggrieved competitors will have to fight their own battle. The one firm article of creed with the present rulers of the Royal Institute is that the President, like the King or the Master of a masonic lodge, can do no wrong, and the Council may be trusted to uphold the decision of an assessor appointed by the President through thick and thin. The Institute regulations for competitions declare that it is the duty of an assessor to determine whether designs comply with the conditions, and if not to exclude them. In this case the assessor has decided that the design he placed first complied with the conditions, and as far as the President and Council of the Royal Institute are concerned, there is an end of it. Whether the assessor is right or wrong makes no difference.

THE article on the sanitation of Winnipeg, which we publish in this issue, should be of interest to those of our readers who contemplate taking part in the meeting on August 25 of the British Association for the Advancement of Science, which is to be held in the Gateway City of the Canadian North-West. Few cities even in Canada have made so remarkable an advancement in recent years as Winnipeg, whose population, which in 1901 was 42,000, had at the end of 1907 increased to 118,000, and there is therefore a fitness in the meeting of the British body that has for its aim the advancement of science in a city of the Empire that has made, and is still making, such great progress in material wealth and resources.

FOR a specimen of the extent to which some members of local governing bodies will carry their principle of haggling into their dealings with professional men the recent proceedings of the Guardians of the Southampton Union would be hard to beat. On a recommendation by the Workhouse Committee that Mr. A. F. GUTTERIDGE should be appointed architect for two new pavilions and an extension of the nurses' home, an endeavour was made to carry a resolution "that applications be invited by public advertisement for the position of architect of such buildings." The attempt was, however, not successful, and the hagglers were forced to be content with an amendment that Mr. GUTTERIDGE's terms should be accepted "unless the phthisical pavilion be on the same lines as the present pavilion, with only balcony and French windows added, when it be suggested that Mr. GUTTERIDGE should accept 4 per cent. for that purpose, and no commission be paid on the heating apparatus." We wonder whether the Southampton Guardians would expect their tailors to make them new coats for ten shillings less than the old ones because they were to be the same pattern, except that the new ones were to have a velvet collar and three more buttons.

THE British Constitution Association having done good work already in promoting a conference of representatives of organisations connected with land, and impressing upon the Government the matured views of those best qualified to judge as to the effect of the Budget proposals on property in land, will hold a second meeting of the Conference at St. James's Hall, Great Portland Street, on Tuesday next, to consider the reply of the Government to their deputation.

TAXING the land is killing the goose that lays the golden eggs. It is not a means of robbing the rich to pay the poor, for land is of no value to its possessor till he has in some way or other paid someone else to help him to get something out of it, and hence the general consensus of opinion amongst experts on land valuation, that if the Government by taxation practically makes it impossible for the landowner to employ others the whole nation suffers.

THE report of Dr. HOUSTON's investigations on the effect of storage in the purification of London's water supply, of which we published an abstract some time ago, has been supplemented by a further report on the ability of the cholera microbe to survive under the conditions fatal to the typhoid microbe, from which we are rejoiced to learn that in this case also, against one of the most dreaded of our epidemic diseases, we are practically safeguarded by the simple and easily applied precaution of storage of our drinking water.

WE trust that there was something more than polite after-dinner gratitude influencing the remarks of the President of the Board of Education when he extolled the

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work done by the Carpenters' Company in the cause of technical education. It is refreshing to find a member of a Liberal Government admitting that there is anything good in a City Company, but the work done by the Carpenters, the Leather-sellers, and other even less wealthy Companies like the Blacksmiths, must convince the most sceptical that there is some good in the Corporation and its Companies.

A CONSIDERABLE amount of feeling appears to have been aroused in Birmingham by the recommendation of the General Purposes Committee to the City Council that the tender of Messrs. WARING & WHITE, LTD., at 128,744*l.*, should be accepted for the superstructure of the Council House extension, and some of the members of the Council were prepared to support the acceptance of a tender higher by 5,500*l.* from a local firm of builders. The great argument, however, that appears to have influenced the majority was that Messrs. WARING & WHITE were prepared to undertake the completion of the work in two years, as against the three years required by other tenderers. It was urged by the opponents of the committee's recommendation that Messrs. WARING & WHITE were a firm of Anglo-American financiers and not builders. Rather a dangerous and two-edged argument to use, as it is tantamount to an admission that our English builders can be beaten out of the field, both for cost and efficiency, by an organisation of smart individuals who are men of business rather than builders. The old-fashioned builder, even in Birmingham, whose citizens usually pride themselves on their smartness, evidently requires to learn more about business, as well as building, before he can hope to stand as a contractor alongside the American trained man who studies the science of business.

THE new St. Paul's Bridge is not to be carried through without opposition. The advocates of Blackfriars and Southwark Bridges are up in arms. Naturally, every new bridge or other avenue of communication that tends to reduce congestion on existing lines of traffic threatens the vested interests of those who benefit by their proximity to such existing lines; but if these vested interests are always to be respected, improvements for the benefit of the general public can never be brought to completion.

ONCE again the "unco guid" is up in arms against the study of the nude. In this case a councillor of York City has fallen foul of the life class for lady students at the York School of Art, but it seems that every care is taken at this school to avoid, we will not say undesirable features, but even the wounding of the feelings of all but those whose pruriency is evidence against themselves. It is quite unnecessary to urge on any healthy minded person the advisability—nay, the necessity—of study from the nude for all who desire to be painters or sculptors.

COMPETITION FOR TRAINING COLLEGE AT HULL.

THE City of Hull Education Committee invite architects to take part in a competition for a proposed College for the Training of Teachers for Elementary Schools, and as the instructions issued bear the names of both Dr. J. T. RILEY, the secretary of education, and Mr. JOHN W. SIMPSON, F.R.I.B.A., the assessor appointed, it may be presumed that, in this case, the fiasco of Middlesbrough will not be repeated, and that intending competitors may feel confident that the instructions and conditions are approved by the City of Hull Education Committee and the assessor, and will not be disapproved by the Council of the Royal Institute of British Architects.

They are also entitled to expect that the assessor will exact compliance with the instructions he has signed, but, on the other hand, competitors ought to be careful to distinguish between those clauses in which "must" and those in which "should" is used.

The proposed training college is to provide accommodation for (1) a hostel for fifty men students, (2) a hostel for 100 women students, (3) a hall and lecture rooms, (4) refectory and kitchens, (5) a principal's house, (6) a gymnasium, (7) a porter's lodge and entrance gates. The detailed requirements for each of these units are clearly described in the instructions, though they are not so fully given as to render unnecessary individual study or experience on the part of competitors.

No definite sum is fixed as a limit of cost, but it is stipulated that "all designs submitted must be of such a character as not to exceed in cost" 5*d.* per cubic foot for the gymnasium, and 7*d.* per cubic foot for the other units, a low enough figure seeing that fire-resisting materials are required for floors, partitions, and staircases.

The site is an irregular one of trapezoidal shape, with a frontage on its shortest side of 445 feet to a road. It is practically level, and contains 15 acres, so that there is ample space for the college and playing fields, &c.

The drawings required are block plan, to scale 40 feet to an inch, plan of each floor, sections and elevations as necessary to fully illustrate the design to one-eighth scale, and an outline perspective and drawings have to be sent in on or before September 20 next.

ARCHITECTURE: ITS TRUE PRINCIPLES.—XIV.

By R. OWEN ALLSOP.

BREADTH.

IMAGINE a small country house composed as follows:—Patches of red brick and of stock brickwork, a patch of tiles, of rubble stone, of weather-tiling, of sham half-timber work; a brick bay, a stone bay, a wooden bay, and roofs broken into senseless masses. Such a building may have some qualities; the one that it certainly has not is *breadth*.

The opposite to breadth of effect is meanness. A building characterised by breadth is the outcome of a broad mind; the petty patchwork is born of the mean mind. Either of that or of ignorance.

A dozen rooms arranged in one rectangular block would be a broad treatment; the same "stuck" together anywhere and anyhow, as first they occurred to the "designer," would be petty and mean. The term "breadth of effect" seems variously employed, but it most correctly designates a liberal broadness of act, kind, or manner. The term is good and expressive. We see too much of small-minded design—ideas not only cribb'd and confined, but having quite an expression of grasping meanness. No amount of wealth of work in detail can give breadth to a design not conceived in a broad spirit.

Breadth implies purity of style—using the term style to signify rather a mode or manner than some special antique, bygone method of design. It assumes something the antithesis of a museum-like collection of architectural devices worked into a general plan and grouped into a building. It does not follow that a much-broken composition lacks breadth as a direct result of the great multiplicity of parts. Our first example well indicates what breadth is not, and it therefore follows that restraint and simplicity and oneness of method are the means of obtaining broad effects. A picture lacking in the quality of breadth is "patchy," full of restless, ill-judged effects of light and shade, or perhaps crammed full of diverse and incongruous objects. A very little will spoil an effect of breadth just as a very small wrongful action will destroy a whole effort that is otherwise commendable. Fig. 34 is an example.

Consistency or constancy, even, are terms somewhat equal in expressiveness of the attribute of breadth. If a design be conceived in a certain antique style, the style should be respected and maintained throughout, otherwise the breadth of effect is missed, and petty changefulness will be apparent. Certain needs of practical service in the art

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of the architect may bring about a grouping of features not of itself broad; his skill then will be shown by so arranging matters that the evil appearance is amended, or at least mitigated. Such, however, is not often the case, a petty, mean, paltry design being rather the outcome of a mind similarly attuned, or of gross ignorance of all art principles. The careful use of materials—the fewest consistent with the effects intended—assists in getting a broad, generous, noble appearance. Possibly the term most expressive of the opposite of breadth is "patchiness." Economy—as distinct from meanness—cannot affect the value of breadth obtained; indeed, it will lead to it by avoiding the adoption of over-elaboration.

We find many painful examples of otherwise imposing stone monumental edifices ruined as to breadth by *patches* of red brickwork. This seems to be essentially a modern vice. No monumental building primarily and in the major portion built of stone is improved by a brickwork patch—which does not say that monumental brick-and-stone buildings cannot be produced. Variation when it destroys breadth is bad, yet variation is the essence of novel effects; hence it must be a very undesirable kind

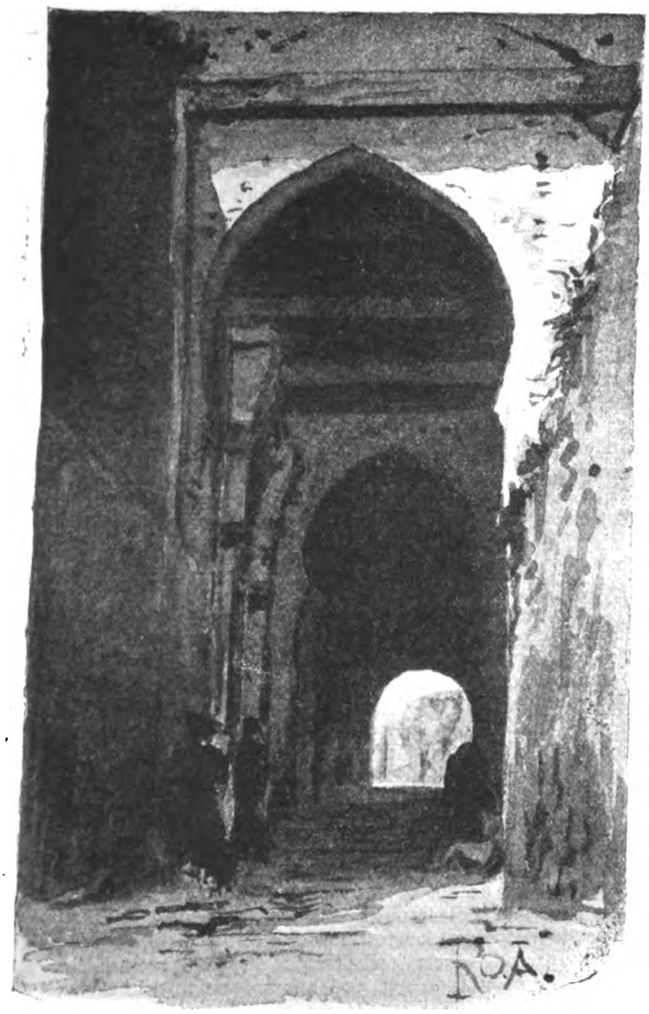


FIG. 34.—GOVERNOR'S PALACE, TANGIER.

of variation indeed that is prejudicial to general composition.

Breadth is best assured by reticence in the matter of enrichment and of what may be termed minor composition—the arrangement of subsidiary masses. The term "breadth of effect" is rather a result than a principle. It is an ultimate aim, and is closely associated with the idea of unity or oneness of effect. Due consideration of the great law of domination and subordination—or, more correctly, the law of subordination—will therefore be the guide to obtaining broad massing of parts. If patchiness were not aggressive it would simply result in variety, but the greatest evil of patchwork is that each patch becomes insubordinate and tends to intrude, to thrust itself (for itself) on the notice of the spectator. The effect of time is to harmonise patches; therefore, if time be given, we get breadth in some respects; but as the idea of architecture is to produce something at once of itself pleasing, it cannot be allowed that the effects of age in improving a building composition is any kind of credit to the architect.

The endeavour to obtain breadth of effect often results in barren monotony, as when a tall building commences with storeys of absolute plainness, and—with some vague idea of obtaining breadth—the designer carries up the rest of the façade in this manner. The result is merely a painful exhibition of the shame of the nakedness of the designer's mind. We may see examples of this. It was not lack of money to pay for "work," but that the architect, vaguely aware that in some way simplicity and dignity go together, had mistaken baldness for simplicity. It is quite evident that elaborate richness is not of itself detrimental to breadth of effect. No one would complain of lack of breadth in the west front of Amiens. It is to be supposed that the production of rich architecture that on all points satisfies the most exacting critics, constitutes a most difficult part of an architect's work; and it is to be noted that the simplicity of the British Museum front and that of a barracks stand on a different plane. The first has resulted in an effect of dignity not easy to parallel; the latter is mere baldness. For an effect of open-handed, generous broadness, combined with relative plainness, it may be difficult to find any better example than the main façade of the Goldsmiths' Hall.

Consistency of style—as a mode of design rather than a variety of bygone architecture—seems a fundamental necessity for breadth. We feel that the round arch in fig. 34 has quite destroyed the general breadth by providing a jarring note; and that this evil effect would remain even if the temporary obstruction in the passage-way—creating a piece of intrinsically ugly form—were removed. The artist appears to regard "breadth" as a result primarily of massing of light and shade, and the careful avoidance of spottiness. In matters architectural, light and shade effects must be considered as secondary—brought about by, and arising from, *form*. Hence consistency in form—as square-headed or arched voids—gives breadth, where intermingling of such leads to the loss of this highly desirable quality. (*To be continued.*)

TOWN PLANNING.*

Ancient and Modern Capitals—Improvement of Existing Towns—The New Towns of Greater Britain—Need of Education for us in Town Planning—Enlargement of present Scheme of Professional Education—Town Planning a New Enthusiasm.

THE creation of a city has a new-world sound about it. The Englishman first, perhaps, thinks of America, where everything civilised has had to be created in the space of a recent epoch, and where there must be a most extensive assortment of experimental town-planning schemes available for European statesmen to consider, digest and appropriate. America has the only modern capital of any account hitherto built on plan, and our great daughter nation, without the glamour of historical association or of style or site, has built with a foresight and design worthy of the great name of Washington. To-day also the opportunity has come to Australia. Wealth, dignity and a fame second to none among the daughters of her mother have grown to be hers in the swiftly passing century of her development. From among the capitals of her provinces, great as they are, she now moves forth to seek a federal metropolis with intention and power to accomplish, we hope and trust, the greatest stride the modern world has witnessed of town planning on the grand scale. It is Australia's to embody in a complete and new continent the wisdom of her government with, we seriously but nervously trust, an architecture competent and noble, characteristic and graceful, the fruit of the ages and as vivid with artistic life as the Commonwealth is with intelligence and power. This is a day indeed for such a subject as ours.

The modern conception, infused with the spirit of ordered

* A lecture by Professor A. Beresford Pite, delivered at Hampstead on July 14 in connection with the Town Planning and Housing Exhibition.

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arrangement, planned with spacious dignity and architectural resource, has to create its own interest and maintain national dignity without the serener charms—why call them adventitious?—such as yielded by the Golden Horn, the yellow Tiber, or our nut-brown Thames to their respective metropolitan cities. The equally precious traditionary blessings of Justinian's building fever, Michel Angelo's tremendous scale, or Wren's capacious genius, attach to the glory of these ancient capitals; but the provision of such equivalent virtue may yet be buried in our race waiting to be evolved by circumstances of education, environment and opportunity. To this end we speak of it to-day. The castle must be designed, be imagined, in the air before it can be drawn or erected upon the earth. The complete idea of a modern city is not, like a historic capital, the product of the mysteries of unrevealed history, but grows by the application of geometry to the courses of traffic, the areas of business or residence and of recreative perambulation, not forgetting the monumental value of spaciousness rather than of compression. One generation, or at most two, is required to realise for this what the laborious tides of time and accident have effected for them. The results are, of course, wholly different and not comparable. The ancient capital has been perforce the shuttlecock and plaything of time and chance, and therefore as well the creation as the creature of natural forces, while the modern city is the deliberate and concrete expression of the work and hope of either an association or an architect.

The full extent of the subject of town planning has certainly as yet barely dawned upon the minds either of legislators or architects. Garden and ideal cities, new suburbs, parks and open spaces, are each extensive subjects and fall within a similar group of ideas. Total effect, architectural grouping, regularity of plan and "lay out," completeness and balance govern the ideal and create the plan to be evolved by the ordered building of the nucleus that shall grow into a great city without distortion or waste of power. This subject, though large, is capable of discussion, and helpful principles can be elucidated to guide and stimulate the formation of an ideal town-development scheme.

The improvement of existing towns is, on the other hand, not so easy of useful theorising. A primary factor will exist in each town which may bear little or no illustration by or application of the principles laid down for an ideal town plan. Towns are more irregular and various in their characteristics and possibilities than even men or women, and an abstract doctrine which might avail for street improvement, say, in a university city like Oxford, would be hopelessly inapplicable at Birmingham. London, Edinburgh, Dublin, or Cardiff would each obviously demand different management on the basis alone of natural configuration, to say nothing of the almost equally urgent considerations of national and local historical monuments and character. The great towns which are almost purely commercial or manufacturing in purpose will vary further, while the class represented by Cheltenham, Harrogate, or Tunbridge Wells and Brighton is governed by quite other hopes and purposes. Local improvements will illustrate how completely circumstances alter cases, and the attempt will be futile to lay down principles that would be adaptable for the guidance of unintelligent boards or officials. A cultivated acquaintance with the beauties of famous streets, public places and groups of buildings will provide a useful standard of ideas, and may lead to that quickened perception of advantage of position and directness of access which is the asset of a good military general. Rigidity of idea or the application of the principles, for instance, that underlie the geometric setting out of a model city plan may provide an engine for destroying the local interests and character of a town. Let old bottle municipalities beware of the new wine of modern doctrine, and cultivate an earnest local enthusiasm, it may be even for a precinct, a close, or a buttery lane, rather than conclude that because electric tramways are the fashion in London suburbs they will prove the importers of fresh vigour into a delightfully crooked old-world city. The wide differences that affect any consideration of the improvement of existing towns, inland or centrally planned, riverside or riparial in system (as London), or seashore with a wide unlimited front extending fan-like from the point of landward approach, prevent any attempt to deal with town-improvement schemes now. It must suffice to say with what interest the architectural profession have viewed the preparation and promotion of Mr. John Burns's Town-planning Bill, and how they are convinced that the ultimate success of its proposals for the general preparation of town development schemes depends upon a wise and educated acquaintance with the great subject of town architecture as a whole. This conviction becomes an anxious prepossession when the possibilities of misconception and failure in the design of schemes which are to acquire a legislative fixedness are contemplated. The need for a proper course of training for the work of designing and preparing town-planning schemes therefore becomes the most anxious question of the day to architects, and one to which it is not too soon to give immediate attention.

Happy is the nation that points to her completed cities, perfect in their orderliness and having the special and rare quality of fulfilled design, where foresight has conquered accident and civilisation is conveniently expressed in geometry of plan and by rapidity of transit. The joys of such cities are like those of a Tantalus to Englishmen; our architects describe this blessedness and incite enthusiastic statesmen to recreate such Elysian fields at home, here in poor, unkempt, untidily free Britain; for if Paris or Washington, why not in Piccadilly, merry Islington, Edmonton, or Ware?

To Greater Britain, however, the subject is a present and urgent one. The world renews its youth and replants itself in sheds of corrugated iron, roughly grouped on pegged-out claims, which ere long shuffle out of their caterpillar and chrysalis coils and solidify with amazing rapidity into vigorous and powerful municipalities and capitals which should also be dignified and beautiful.

To-day, while we at home are gardening the suburbs of our old incorrigible cities, the Empire is town-building in earnest, perforce from the impulse of development and heartily moved by the fresh vigour and renewed naturalness of those humane instincts of building and gregariousness which are wider than either the building trade or architectural profession. This town-planning instinct—for it is nothing less in man than in ant, bee, or beaver—has up to the present received no recognition from its proper foster-fathers, the authorities of building education and practice. Empire building, I speak literally, not figuratively, of the incessant daily processes of foundation digging, walling and roofing, without the aid of any ordered system of mental exercise, without the specialised instruction afforded by study and experience, in every fresh extension or renewal of town life is laboriously and disastrously repeating huge blunders and petrifying stupidities and ignorances which are a reproach to any people.

For much and all of this a sound and simple architectural education would be something more than a palliative; this evil is wrought more by want of thought than want of heart in willingness to do the best; and the best is the wisest both economically and delightfully.

You may note how incessantly the so-called orders of Classic architecture are reproduced as an alphabet of design more or less correctly and studiously in the various classes of modern buildings in all climes. These forms have been laboriously acquired, drawn and reproduced. Were half the time and space so devoted by instructors and handbooks afforded to a broader view of what makes for the architectural dignity and beauty of buildings, streets and cities, the modern world would have more clearly revealed in its current monuments the wisdom of its makers.

There is indeed room in all our centres of architectural life and education for a constant attention to the subject of the proper design of towns. All of us have to do with town life, and are actually in these constitutionally democratic days the paymasters and collective dictators of our own municipal officers, who build, regulate and plan our streets, or should do so; and apart from any infusion of architectural thought into a general scheme of educational reform, which is greatly to be desired, for works of art and nature should not be divorced or unequally yoked in the education of a just mental balance. The specialised training in architecture of its own practitioners ignores this subject gloriously.

The recognition of the problems of our own Colonial life, which are more extensive, interesting and beneficial than most, if not all, of the stock historical and ornamental exercises of the architectural student, urgently claim attention at headquarters. The stock properties of professional education are exercises in purely local architectural limitations both in æsthetic history and in constructional practice. An English architect practising in India questioned me the other day as to suitable precedents for the case of a clergyman who had instructed him to design a church in the Norman style for an Indian station. It is surely bad enough to put the hands of the clock back eight centuries at home in ecclesiastical building, but to employ local English time, and that eight centuries late, where sunshine, seasons and

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simoons all differ is a marvel of the refined perception of the intelligent mission of architectural expression. The practical art of building construction is, moreover, not as yet taught as an exact science the principles of which are capable of universal application, as indeed they are on every spot on this habitable globe where the law of gravitation works. All materials and climates yield obedience to principles of design which are not more abstruse or difficult of perception than those which govern British standard bricks or Baltic scantlings. The chemist, naturalist and engineer go forth into the wider world of Britain beyond the seas equipped for varying conditions and relationships to nature. Why should not the builder and architect, upon whom devolves the conception and construction of multitudinous buildings, be equally furnished by education with a ready knowledge of how to employ his present opportunity and its characteristic materials and purposes?

But such an education, if confined to architectural candidates—that is, to intending professional men—may entirely miss the class of energetic prospectors, probably the most miscellaneous of all classifications. Though it certainly is reasonable and necessary, it would be an amazement out of Wonderland if the necessity of having a proper architectural member of the staff was recognised in the public prospectus of any of those companies which by the development of gold and diamond mines, or coal or otherwise, incessantly create embryo townships which ere long become provincial centres and perhaps capitals. In a general education syllabus should not some practical application of geographical particulars lead to the formation of ideals as to situation, lay-out and growth in the great cities of the world? Lantern-slide excursions would very rapidly involve actual acquaintance with satisfactory examples for criticism and instruction. How to build a town—what comes first—the inevitableness of widenings—the certain increment of values near the meeting place of routes—rapid temporary building as of a camp, with illustrations of how the exigencies of the Roman military castra have until to-day fixed up the facts in dozens of living English townships. All this and much more of vital work could be most profitably sown into the youthful English mind for certain fruitfulness both at home and overseas in the short course of a rising generation. Happily there is more educational elasticity both of outlook and method in all classes now, and one can foresee a new and happy mingling of the Classic and modern sides of the present much-debated school curricula in a study of Greek and Roman civic law and practice applied to the most progressive ideas and facts of the day.

But our point of view as specially educated architects is terribly limited. The present-day architect is not in any true sense a survival of mediævalism or follower of the cathedral builders; he is not even an intelligent archæological product, for you will look in vain among mediæval builders for any trace of the modern delusive vision of the beauty of all that is nearly 200 years old, or of the necessary evil of modern matter. The progressive ancient architect spurned to follow not only the work of his immediate predecessor—the present day does that too, and with marvellous and unfathomable self-complacency—but he refused any undue respect to precedent, and incessantly moved onward gathering momentum each generation from the eleventh century until the sixteenth; the progress of civilisation, craftsmanship and science evidenced in the building arts of England between the times of William the Conqueror and the Tudors—that is, from St. John's Chapel in the Tower of London to Henry VII.'s Chapel at Westminster—is probably unparalleled in Europe. The modern architect moans at the progressive age in which he is cast, and lacking the spirit, imitates the letters and spelling of the builders of Chaucer's day. So the Empire has to grow without his sympathy and aid, lacking a true architectural flavour in the pottage of its common life.

In the new interest of town planning one may foresee and hope for a new enthusiasm for the progressive humane science of building and buildings that will liberate us from the narrowness of our very limited antiquarianism. The history of the world lies most evidently in that of its towns, not merely that they are the physical embodiment of varying epochs of character and power, but are the expression of intellectual forces and character. The architect of a town has a special and vital interest in the civic life of ancient Hellas, and finds in the municipal legislation of Rome, as well as in the pathetic crookedness of the Via Sacra amidst all the grandeurs of the Forums, more secrets of town planning than he has yet suspected. Palmyra, queen of the desert, the still evident greatness of the cities of the southern shore of the Mediterranean, all have secrets to give up of the greatness and science of the world's greatest building empire. Spalato and the later Byzantine greatness of Justinian's school of building, all and each varying and wonderful, are fields yet undetailed for the student of this subject. Here archæology becomes dry-as-dust antiquarianism, but vitally intelligent archæology is a practical training in architecture unrivalled in its mental discipline and opening power. The road building, aqueduct bringing, the permanence of the Cloaca Maxima, are all subjects waiting for inclusion in this branch of architectural study, where the ancient and modern world will unite in the bond of sympathetic pursuit of sanitation and order. In a later period of petty warring States, but of ecclesiastical unity, the Mediæval vision begins to fill the eye, and has strangely attracted modern fancy. Sentiment, properly ordered, is one of the strongest elements in architectural beauty, but let loose upon romantic Mediævalism it has usurped more than its proportion or measure. Modern artists, jaded in their conflict with engineering progress and philistinism, experience with refreshing excitement the historic thrill of a decaying city, and marvel at the playfulness of Time with the garments of a sleeping city; their happy souls number the scars of time, trace with patriotic but artistic fervour the storm marks, assaults, demolitions and recoveries of the almost vanished ancient life. The grass-grown street, the grey oak, the sunken lathings, the faded whitewash, the decaying brickwork and weather-worn masonry are the tonics that art and affection minister to recovery from the fog-laden air of this uncared-for brutally modern age. And they make what use they can of these invigorations, and the semblances of irregularity are imparted not only to plans but to buildings and groups; and this art, creating its own atmosphere, breathes in petty quaintness the romantic air of the past. This humour, this antiquarian hypocrisy, superstition and credulity may be lawfully exercised in private at the expense of those it amuses, but the practical earnestness of town planning forbids such sentimental pantomime. What would a poor motor-'bus do if the texture of Mediæval romance were imparted to the pavement or gradients of the high street, or its pointed acuteness to the angles of the market square? What civil or sanitary authority would tolerate genuine active exsumatory gargoyles in a summer storm? And what use are the symbols of Mediæval fortification, the fruit of blood-bought experiments redolent of feudal oppression and municipal dependence as means of an artistic expression of modern life? All this can be left to become the whim-food of the private client, attesting like the Gibeonitish mouldy bread, clouted garments and rent wine-skins the distance of the journey from the facts of to-day.

In town planning the ancient and the modern divide sharply. We are here in the living present and cannot stay to quarrel longer with the private practice of architects, but preach again the new mission to educate in the essentials of great and noble architecture the race that is building cities around the world to-day and every day without adequate guidance from those who should be entitled to lead.

THE PROPOSED LAND TAXES.

THE Surveyors' Association has followed the lead of the Surveyors' Institution, and has issued a memorandum in which the opinion of many of our leading land surveyors is thus expressed:—

1. *Increment Value Duty.*

The imposition of this duty will seriously affect the value of land of every description, agricultural and otherwise, throughout the country, as investors will naturally prefer to place their capital in securities where they will not run the risk of losing one-fifth of any increased value. The increment value in the majority of cases merely represents deferred interest on the original purchase money, and a duty on that value will tend to retard rather than assist development, for which, even on estates of moderate size, considerable capital is required in the formation of roads and erection of houses. This capital the greater number of owners and builders do not possess, and they obtain it by means of mortgages which the imposition of a duty will make it increasingly difficult to secure. The present depression in the building trade is consequently certain to be aggravated, and unemployment increased. Properties which have been purchased for development have frequently been found on a resale to have decreased considerably in value, and if an increment duty is imposed it is only just that in the event of depreciation a return of that duty should be allowed.

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2. *Reversion Duty.*

This duty will work most unfairly upon owners who have purchased ground-rents on the faith of the stability of the land laws of the country, the reversionary annual income to be received on the expiration of the existing lease having been carefully calculated in determining the purchase price. Many private owners of ground-rents have purchased with a view to providing, after their death, an income for the support of their families, and the proposed duty will diminish the capital value of that provision. Trustees, life insurance companies, with whom policies are taken out by all classes, building, and land companies, friendly societies and others who have purchased this class of security, will find their investments seriously depreciated, and on realisation will suffer considerable loss of capital.

3. *Duty on Undeveloped Land and Mineral Rights.*

A duty on undeveloped land is calculated to injure building development even more seriously than the increment duty, for the reasons set out above. If the imposition of a duty has the effect of forcing land not ripe for development into the market for building purposes, disaster will follow, as experience has shown. To place a special duty on the grounds of a house, where they exceed one acre in extent, would certainly result in the reduction of the air spaces in and around the great towns, to the general detriment. The "Mineral Rights" duty will cause great hardship to owners of areas already under lease, and in many instances it will be equal to an additional shilling in the pound on the income tax, which is already collected on the capital value of minerals as well as on the income. Minerals generally, but particularly in undeveloped areas, are so uncertain in value that the taking of capital value as the basis for the assessment of a yearly duty is inequitable unless full provision is made for repayment in cases where the valuation shall have been proved by the event to have been wrong.

4. *Generally.*

The proposal that the decision of the Commissioners shall be final is an undesirable and drastic change from the practice now in force in assessing death duties, where an appeal to the High Court is allowed. At the present time, owing to the great decrease in the value of property, the margin on many mortgages has been reduced below the statutory one-third, and the imposition of the proposed duties will cause a still further reduction, so that trustees and others who have hitherto regarded mortgages as one of the soundest forms of investment will be compelled to call in their capital and invest it in other securities; the result being great hardship on, and expense to, the owners of property, and restriction of the capital available for investment in land. The Finance Bill has already had a deterrent effect on the letting of building land, and some of the signatories have experienced instances where contracts, which were on the eve of completion, have been annulled on account of the cumulative taxes proposed, and the cancelling of these agreements will cause an enormous amount of unemployment in the building and allied trades.

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 12, MR. R. NORMAN SHAW, R.A.

MR. NORMAN SHAW has so far outlived the other leading architects of his day that he is now the *doyen* of the profession, and although virtually retired from practice is still an influence for good in our modern architecture.

NO. 13, PROFESSOR BERESFORD PITE, F.R.I.B.A.

PROFESSOR BERESFORD PITE is not only a professor, but one of the virile architects of the day, and his work, from the appearance of his notable Soane medallion design, is always of piquant interest.

COMPETITION DESIGN FOR MIDDLESBROUGH PUBLIC LIBRARY, BY MESSRS. HALL-JONES & CUMMINGS.

THE plan and design of this building were largely governed by the conditions which fixed the positions of the important parts, and also the nature of windows, height of sills, &c.

It will be seen that the boys' and girls' reading rooms are placed next to the general news room, thereby enabling the janitor to have complete supervision. The general lending library is in the northern part of the site, with the principal entrance and stairs leading to the first floor; and the ladies' reading room adjoins same at the northern extremity. The upper floor is given up to the reference and patents libraries, forming a simple arrangement with the other required rooms.

With regard to the general lending library it appeared that the arrangement shown on plan would be best in order to give light between the book stacks as well as greater convenience to the public.

It was proposed to face the buildings with red bricks and stone dressings, the diaper work in frieze being formed with dark coloured brickwork, and to cover the roof with red tiles.

COMPETITION DESIGN FOR MIDDLESBROUGH PUBLIC LIBRARY, BY T. GERARD DAVIDSON, M.S.A.

THE schedule of requirements was followed closely, and every effort made to yield the largest accommodation from the awkward L-shaped site.

The plan shows the "indicator" system to the lending department but the "open access" could be applied without difficulty.

A broad and somewhat severe treatment in red brick and stone, with a green slate roof, was proposed, and the windows cast their light down the length and not across reading tables and stands. Top lights are used in the reference department.

The departments being on two floors, the librarian's room affords additional supervision over the reference and law libraries, while below the janitor controls the boys' as well as the general reading room.

PELHAM SCHOOL, WIMBLEDON.—NORTH-EAST VIEW FROM SOUTHEY ROAD—AN ENTRANCE DOORWAY—AN ENTRANCE GATEWAY.

THESE schools are to accommodate 1,000 pupils, nearly equally divided among the three departments of boys on the second floor, girls on the first, and infants on the ground floor. The site is about three-quarters of an acre in area. The general arrangement of all the floors is similar. On each there is an ample assembly hall. The east side of the building (securing the best light) is wholly occupied by classrooms. The assembly hall looks to the west, and additional classrooms are placed at either end of the hall. The windows of every classroom are carried to the full height, and each scholar has a left-hand light. With the exception of two rooms in the infants' school no classroom is for more than forty pupils. Each department has two entrances to the playground, with cloakrooms and lavatories ranged round them. The bell tower rises to 100 feet, and contains a supply cistern for 1,000 gallons. The schools are warmed by a low-pressure hot-water system from the basement, and in addition opening fireplaces are in the teachers' rooms and infants' classrooms. The ventilation, besides that of the windows, is combined with the heating system by the use of ventilating radiators for the supply of fresh air. The schools have electric light throughout. Two electric fire-alarm bells are in the corridors of each floor. The elevations are of picked dark brown Crowborough bricks and LAWRENCE'S hand-made red bricks, while the dressings are of Portland stone. The floors are of steel and concrete construction, fire-resisting and sound-proof. The assembly halls are panelled in green stained wood up to 7 feet. The classrooms and corridors have antique glazed tiled dadoes. The style of the building is based upon Early Georgian, which adapts itself readily to requirements of light, ventilation, and arrangement, and, without lack of dignity, has a very suitable domestic character. The contract was made on April 29, 1908, with Messrs. ALLEN FAIRHEAD & SON, of Enfield, for 15,920*l.*, and was completed in fourteen months. The total cost of the building has been 16,457*l.* 15*s.* 9*d.* Among the other contractors were:—Modelled Plasterwork, The Veronese Co., Ltd.; asphalte, The Seyssel and Metallic Lava Asphalte Co., Ltd.; grates, BRATT, COLBRAN & Co.; lift, ARCHIBALD SMITH & STEVENS. The design was obtained by a limited competition, to take part in which there were 172 applications. The competitors were limited to fifteen, with Mr. J. W. SIMPSON as assessor. His award gave first place to Mr. H. P. BURKE DOWNING, F.R.I.B.A., of 12 Little College Street, Westminster, S.W., who has carried out the work; and the buildings were opened on Wednesday last by the Right Hon. Lord ALVERSTONE, Lord Chief Justice of England.

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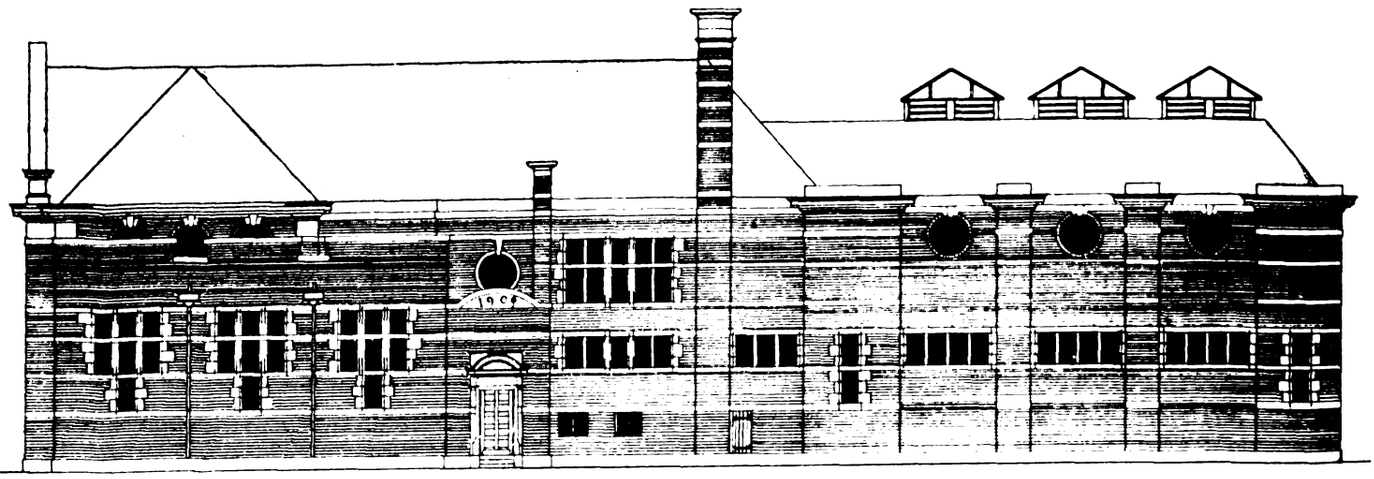


LIVING ARCHITECTS.. No. 12: MR. NORMAN SHAW, R.A.

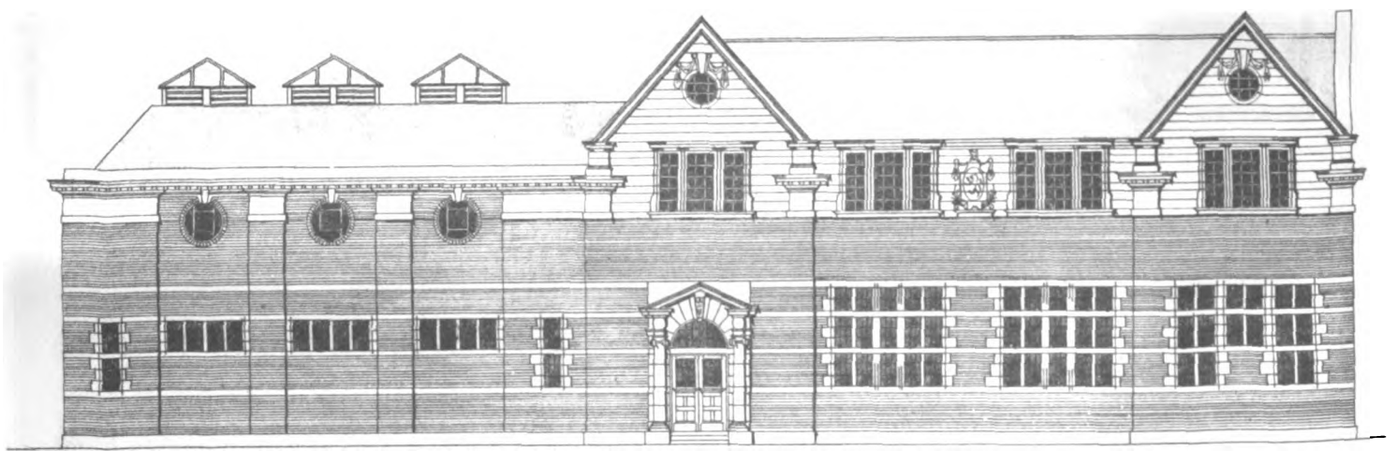
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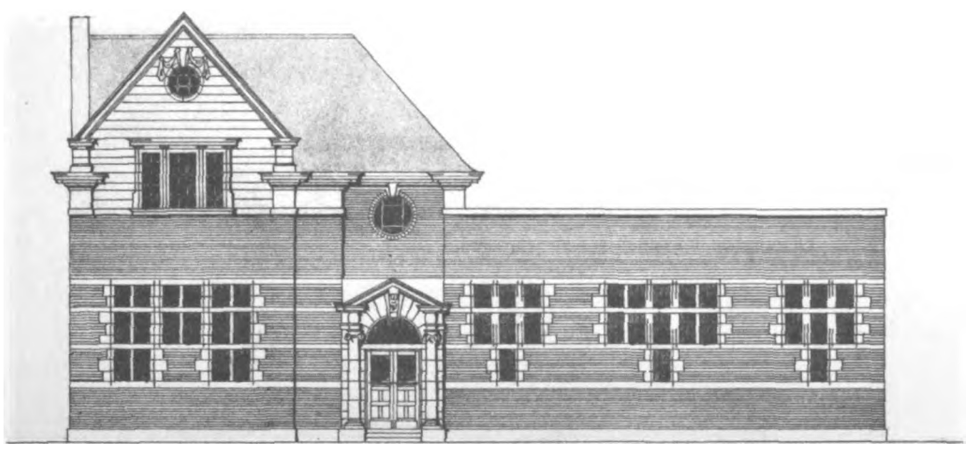
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To Poplar Street. → To Back Passage.



To Dunning Street.

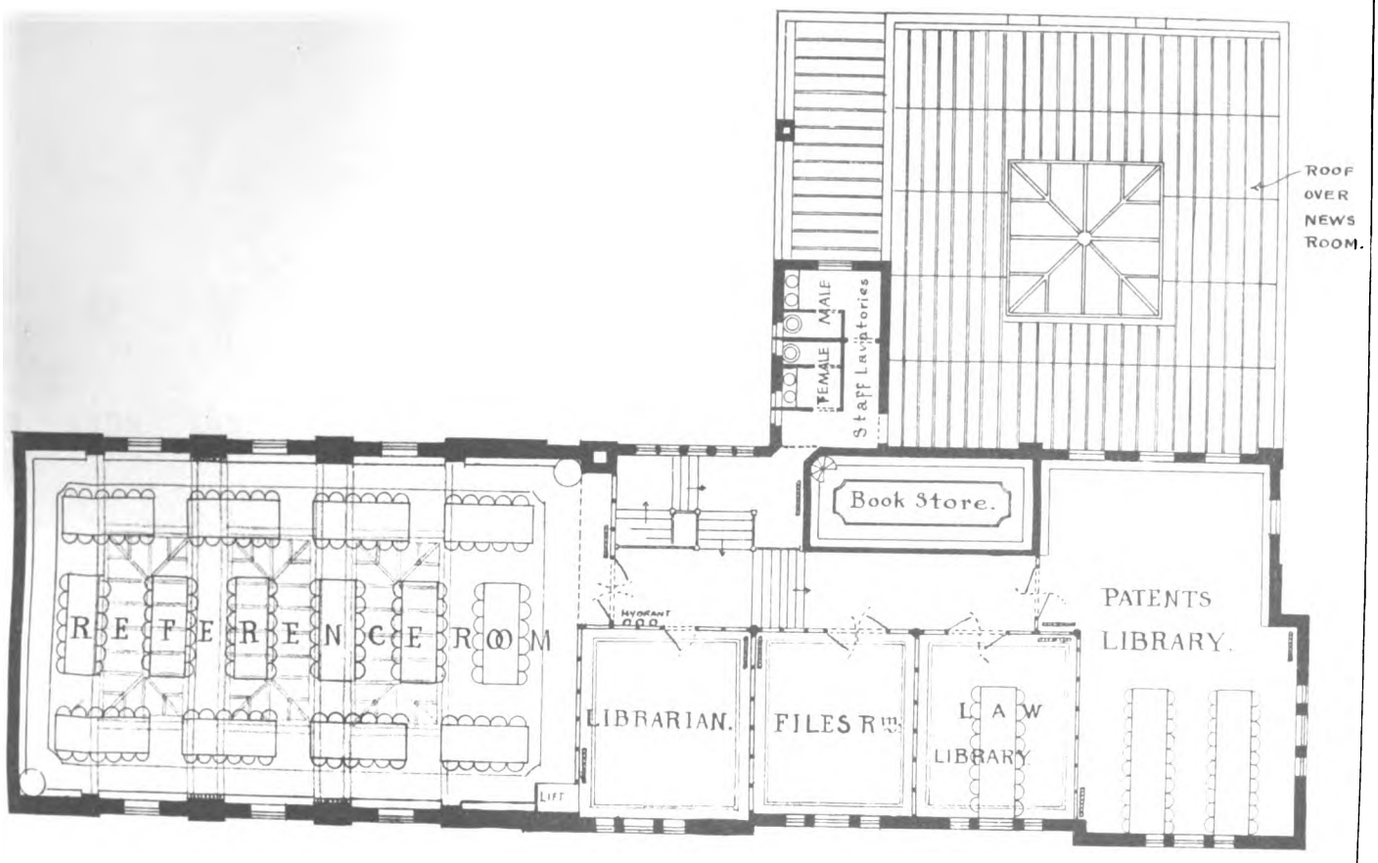


To Grang Road:

COMPETITION DESIGN FOR MID
By T. GERARD DA

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July 16th 1909.



FIRST FLOOR.

Accomodation.

Lending Library: 35,000 volumes at 10 to a foot.

NEWS Room: 88 readers at tables: Wallslopes for 45 newspapers.

Ladies Room: 44 readers at tables: Wallslopes for 14 newspapers.

Juvenile Rooms: 34 boys & 34 Girls – all at tables
" Bookstore for 4,000 vols.

Reference Library: 164 readers at tables; bookstacks for 23,000 volumes.

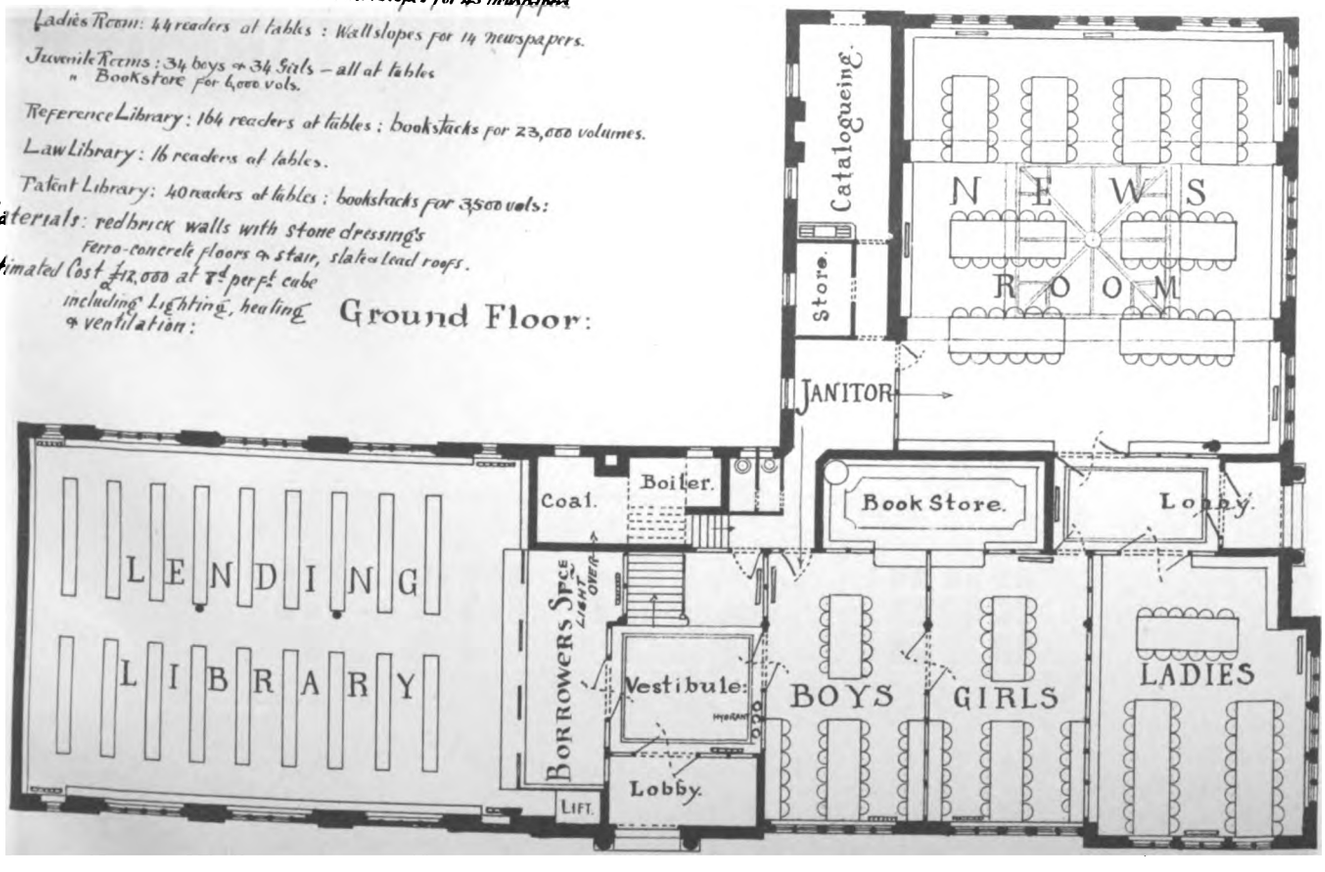
Law Library: 16 readers at tables.

Patent Library: 40 readers at tables: bookstacks for 3500 vols:

Materials: redbrick walls with stone dressings
ferro-concrete floors & stair, slated & lead roofs.

Estimated Cost £12,000 at 8d per ft. cube
including Lighting, heating & ventilation:

Ground Floor:



"INK PHOTO" SPRAGUE & C° L^D 4 & 5 EAST HARDING STREET, FETTER LANE E.C.

MIDDLESBROUGH PUBLIC LIBRARY.
J. DAVIDSON, M.S.A.

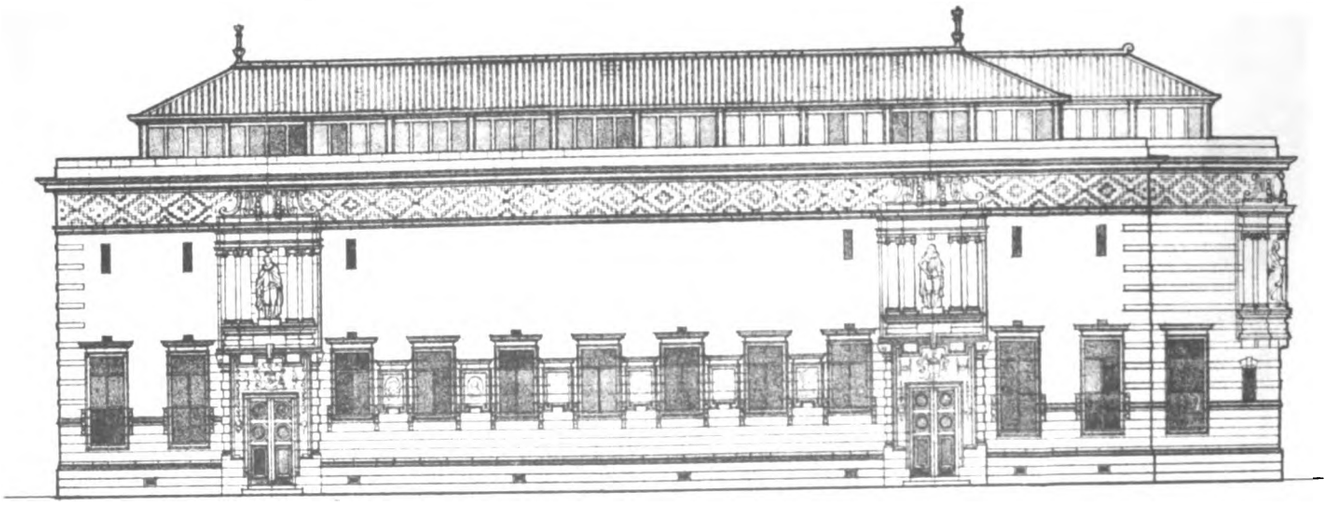
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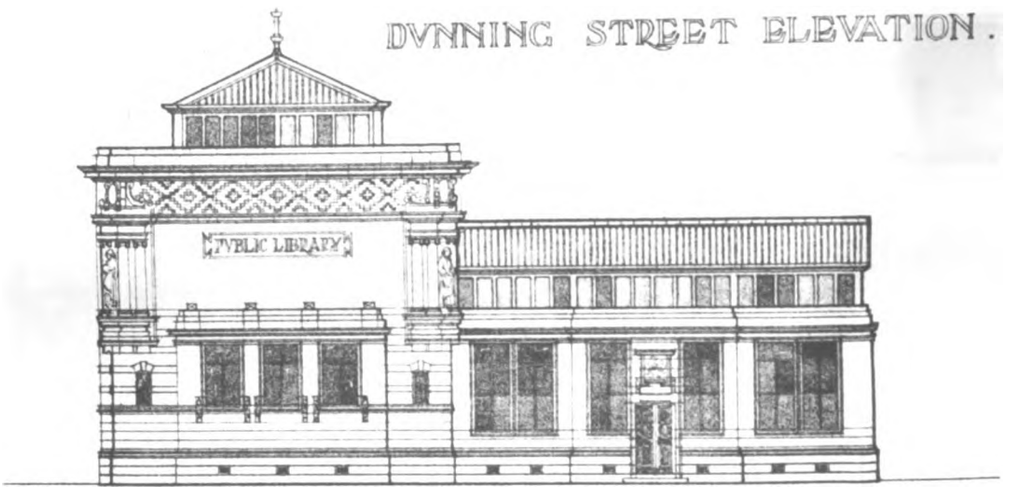


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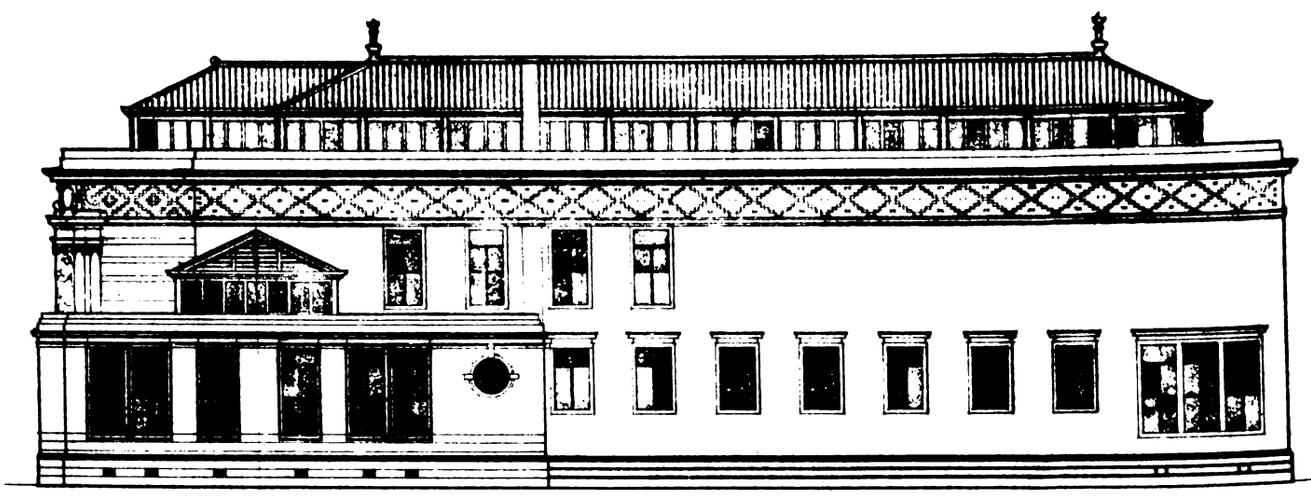
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DVNNING STREET ELEVATION.



GRANGE ROAD ELEVATION



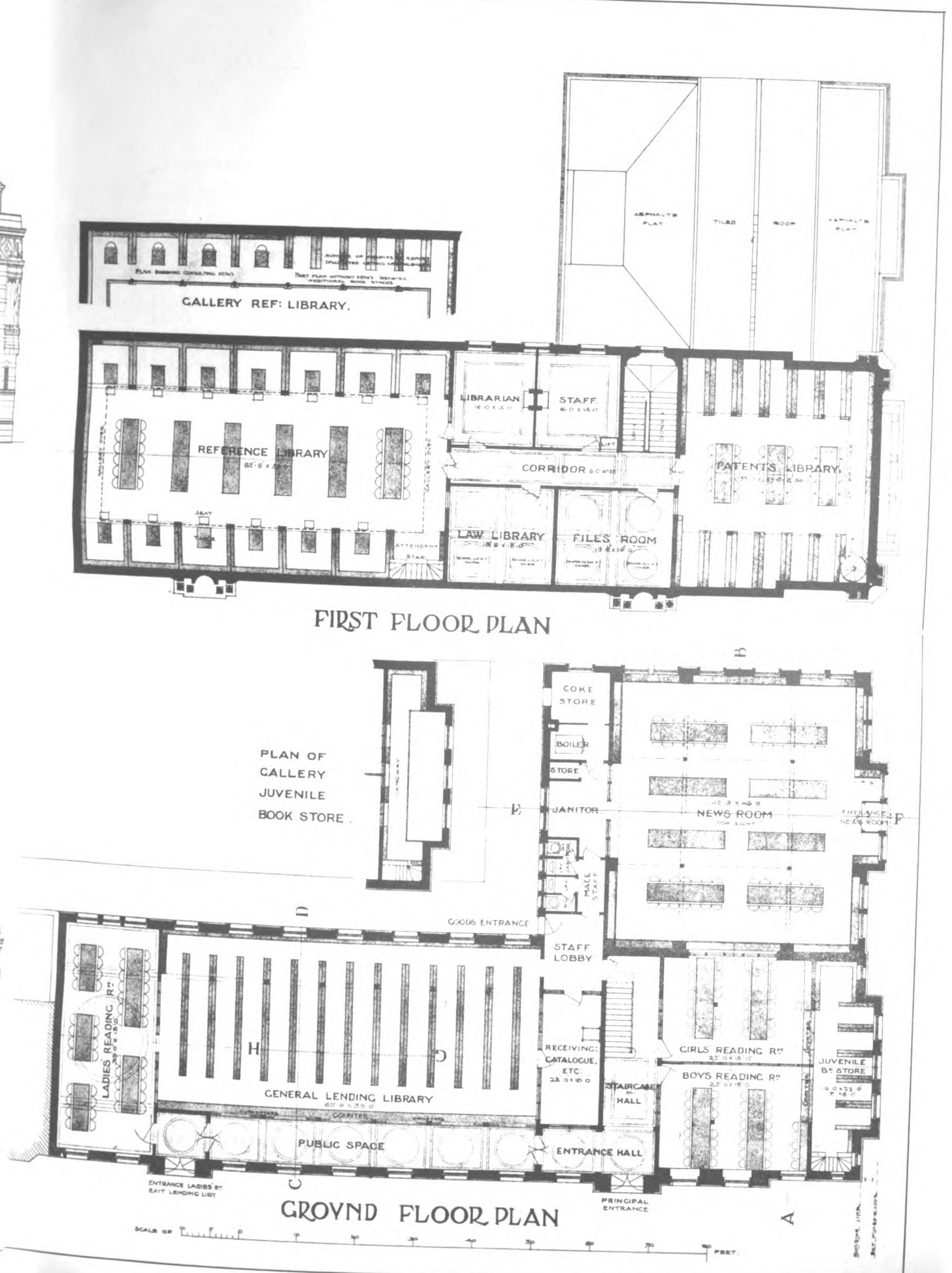
POPLAR STREET ELEVATION

SCALE OF FEET.

COMPETITION DESIGN FOR MIDDL

By Messrs. HALL JONES

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NES & CUMMINGS.

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NORTH-EAST VIEW FROM SOUTHEY ROAD

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AN ENTRANCE DOORWAY.



AN ENTRANCE GATEWAY.

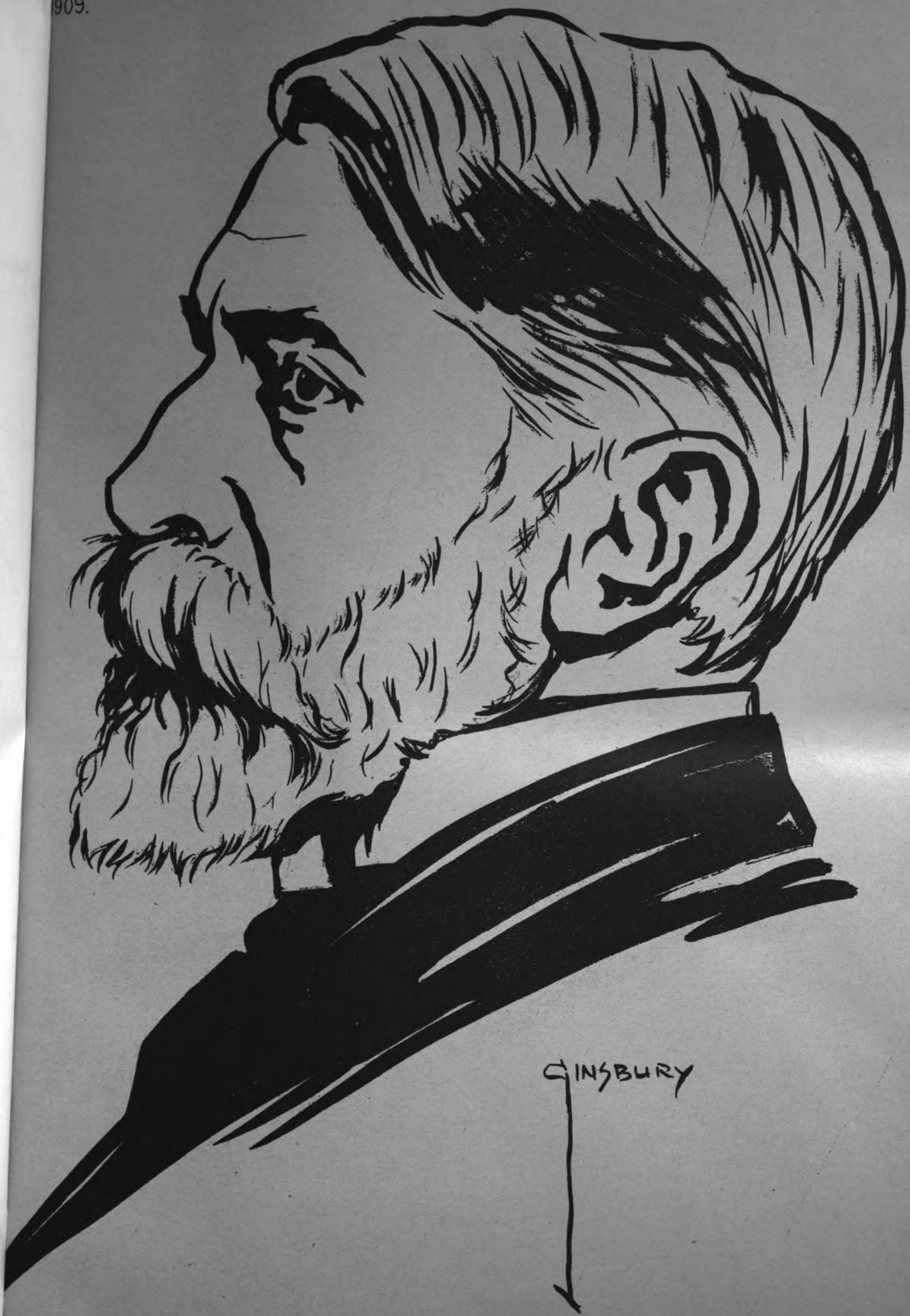
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PELHAM SCHOOL, WIMBLEDON.

H P BURKE DOWNING, F.R.I.B.A., Architect.

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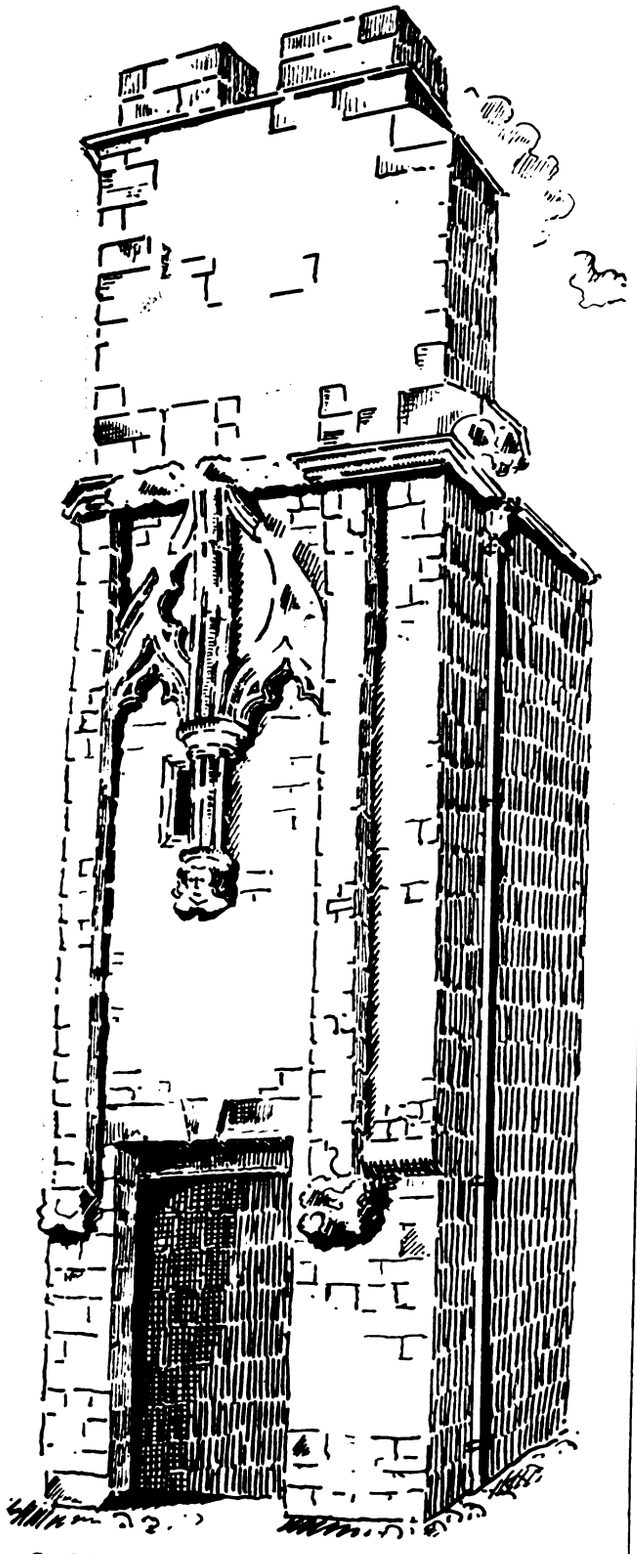
LIVING ARCHITECTS. No. 13: PROFESSOR BERESFORD PITE, F.R.I.B.A.

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CARLISLE CASTLE.

QUEEN MARY'S TOWER, so called from having been the place where the Queen of SCOTS was confined by order of ELIZABETH in 1568, is situated in the south-east angle of the inner ward. This is a conspicuous feature, and above the entrance can still be seen a very fine piece of thirteenth-century work. The tower is tall and narrow, having very thick walls, and the windows admit very little light into the interior. The tracery and cornice are now very much worn owing to the inclemency of the weather. The exact date of erection is not known. Our illustration is from a sketch by Mr. H. SCOTT-SAWYER, 12 Howard Place, Carlisle.



· QVEEN · MARY'S · TOWER ·
· CARLISLE · CASTLE ·

WINNIPEG, FROM A SANITARY POINT OF VIEW.

By WILLIAM BRUCE, of Winnipeg.

HISTORY always repeats itself, and it has done so since the world began and will continue to do so until the end of time; consequently Winnipeg will soon require to thoroughly overhaul its defective sanitary work, as some older cities have done owing to the want of foresight in past years.

Winnipeg is the centre of the principal railway lines running through Canada, and it has justly been described as the gateway to the great north-west, with its rich lands, extensive minerals and oils, &c., to be found all over the country and only waiting for capital to develop its wonderful wealth. It is not only the principal railroads that lead to Winnipeg, but the city is built at the junction of two rivers, and the Red River will at least become a great summer waterway for passengers and traffic, as we can see at the present day in other parts of the British Empire.

It is a doubtful policy to go on spending large sums of money, digging wells, erecting pumping machinery, and after the water is brought to the surface to proceed to put it through a softening process, at great expense, when a good supply of water can be got to supply the city by gravitation from one of the lakes north of the city.

The newly elected Council are progressive business men, and it is hoped that they will stop the spending of large sums of money for the digging of wells, and they may with advantage recall to mind the past experience of the city of Glasgow, Scotland. When the City Council of Glasgow took its splendid supply of water from the western highlands of Scotland, it was I think clearly proved that the citizens saved in their soap bill every year as much money as paid the interest on the capital invested in the water supply. Another point in favour of taking a good supply from one of the lakes is the fact that the fire insurance companies must reduce their rates, otherwise local companies will be formed that can cut the rates in two and still retain a large margin of profits to cover all risks. At the present time the fire insurance companies have the defective electric wiring to contend with and take the risk arising from that source, also the risks in connection with the hot air heating in so many buildings, but these are small details that some of the citizens should bring under the notice of the City Council and show the necessity of a new by-law, modern and up-to-date in all its details, to rectify all the defective work in new buildings, so far as the fire risks exist.

It is needless to add that the City Council will with pleasure take the matter up as soon as a case is put before the members.

The most expensive problem in front of the citizens is the sewage question, arising from the want of foresight in the management of this very important question, as the necessary changes will cost the taxpayers an enormous amount of money.

The city as it now exists is built at the junction of two rivers, and both rivers have a splendid fall for all drainage purposes. Both rivers have been used as outlets for the sewers when only one should have been used for that purpose, and only on the north side of the city, that is down stream, past the city. The present city is erected on an area of ground possessing a fall, and all the advantages that are required for good drainage. In other words, nature has provided the water shed of the Red River with a sufficient fall for all the sewage of a very large city, and it only remains for the City Council to take advantage of what nature has provided.

Let us consider what has been done by the civic rulers in the past.

We find that they have not taken advantage of the natural fall of the ground on which the city is built, they have not skilfully arranged the sewers in such a way as to take advantage of the fall of the Red River to keep the banks of the two rivers clean where they pass through the city. In place of taking advantage of what nature has provided, the mistaken policy has been adopted of discharging the sewers into the rivers at the nearest point, polluting the water and leaving the banks dirty, where the rivers pass through the best residential districts and through the business parts of the city. During the summer months one of the rivers is in the condition of an open sewer, very offensive and dirty. The sewers are discharging their contents in a most objectionable manner where large commercial establishments will be erected on the banks of the rivers as the city

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increases in size. This is the want of capable management and foresight on the part of those responsible for the plan of the city sewers, and it will become a very expensive proposition for the taxpayer when the mistakes must be rectified, and at no distant date, if Winnipeg is to become a large city.

The rivers running through the city should be kept free from the city's sewerage, and now that can only be done by the construction of large intercepting sewers, skilfully planned and of sufficient size to convey all the sewerage from Silver Heights and River Park district.

One of the first duties of the new Council should be to construct all the new sewers to fall in the right direction, that is leading down the Red River past the city, as the day is not far distant when Winnipeg will purify its sewerage, and that time will be hastened forward when cheap power is supplied and various classes of manufacturers have taken up positions within the city limits.

It is not only the general plan of the sewers that is defective, but the want of proper sewer ventilation is a disgrace to the city of Winnipeg, as nearly every manhole grate shows at the present time. A little skill and foresight on the part of those responsible for the present condition of the sewers and house drainage would have resulted in some modern sewer ventilation at all the high buildings erected in the city. This arrangement could have been carried out at very little expense to the city and the nuisance completely removed from the surface of the streets, and prevent the dangerous and disagreeable sewer air from entering all dwelling-houses and business premises that are situated near the manholes.

It is carelessness, the want of knowledge and foresight that has brought on this state of matters, and the question now arises, how is the evil to be overcome?

Under present conditions at the City Hall, all improvement and progress in sanitary work is at a complete standstill. A new sanitary by-law is required accompanied by skilful administration of any new regulation that the Council may adopt. If this important matter is placed in the hands of experienced sanitary experts a scheme can be arranged and the evils removed by adopting a system of sewer ventilation that experience has proved to be very successful in older and much larger cities, that is, to connect to every house drain, outside of the house trap, a four, five, or six inch pipe as a sewer ventilator, carried up through the roof at the side of a smoke flue if possible, so that the heat from the flue will induce a stronger current. In warm climates the sewer ventilators are fixed outside, but that plan will not work in this climate of Manitoba and the north-west of Canada. If it is not convenient to fix the ventilation pipes near the smoke flues, they should not be erected in a cold position, and where iron is used for ventilating purposes, care should be taken to avoid bends at the foot of the pipes, liable to stoppage by rust that falls from the inside of iron pipes. Lead is the most suitable material for sewer ventilators, with long easy bends where necessary, and fixed with cast lead ears, soldered to the pipes, about every three feet apart and well fixed to the walls.

As some people may question the efficiency of this system of pipe ventilation in Winnipeg, the following facts may remove any doubts in relation to the good work accomplished by pipes when used as sewer ventilators. The writer has made a careful study of this important detail of sanitation, and carefully conducted numerous practical tests under all weather conditions, with accurate instruments for testing the air currents discharged at the top of ventilation pipes.

At a low building near a high building the upward current of air extracted from the sewers will average about 60 feet lineal per minute. At a three-storey building from 250 feet to 450 feet lineal per minute. Much depends on the position of the pipes, the manner in which they are fixed, and the height of the building in its relation to other buildings adjoining.

Last December some tests were made in Winnipeg at the following buildings:—

South Fire Hall, 100 cubic feet per minute, or 6,000 per hour.

Crump Block, 65 cubic feet per minute, or 3,900 per hour.

Codville Georgeson, 37 cubic feet per minute, or 2,220 per hour.

Mr. Boyd's residence, 20 cubic feet per minute, or 1,200 per hour.

Sterling Block, local drainage, 33 cubic feet per minute, or 1,980 per hour.

This may be taken as reliable evidence that the sewers of Winnipeg can be thoroughly ventilated by means of sewer pipe ventilators, as in other cities.

The holes in the manhole covers are more than double the size of what they should have been in this climate; but that is a very simple matter, and the area of inlet to the sewers can be reduced by means of sheet iron plates placed below the grates.

If the system of pipe ventilators is adopted at all new buildings and at the rebuilding of property in the centre of the city, the discharge from the manhole grates will soon disappear.

The ventilation of the sewers is only one of many important details in connection with the sanitation of the city that should be improved upon, as the house drainage and internal plumbing requires to be thoroughly modernised for the protection of the health of the citizens. The defects of the present system of house drainage and plumbing are too numerous to describe.

In all large cities where the civic work is conducted on modern principles, the architects show on their plans all the drains, pipes and fittings, and when the building inspector grants a permit to execute the work according to plans approved of, that permit covers all that is shown on the drawings; and the building inspector's staff of assistants includes some practical and trained plumbers, whose work it is to test the drains, soil and vent pipes, and test by pressure, at a station provided for the purpose, all the cocks and valves used by the plumbers for the water fittings of the city. It is usual to charge a small fee of about two cents for testing and stamping each article, and the same men inspect the water fittings before the water is turned on in any building.

In Winnipeg the work is divided into sections. The building inspector has a part, the inspector of plumbing, acting under the city engineer, has another part, and then follows the electric engineer, and his part not only includes his own work, but he also has a say in certain details of construction. In the face of all this divided responsibility, the building by-law plainly reads that the drawings are to show construction and *equipment*. It would be much more satisfactory to owners, architects and the contractors if the city officials agreed among themselves on all the details shown on a set of drawings, and have everything complete before a permit is granted.

What Winnipeg requires at the present day is a complete building by-law to cover all details of a building, and in addition to the printed clauses a number of illustrations should be attached to show two or three different ways of executing work that cannot be well described in print, especially house drainage and plumber work.

The owners of high-class residential property would willingly have all their sanitary work executed in the best and most up-to-date manner. It is to be hoped that the day is not far distant when first class property will have all the drains outside the buildings, all with proper manholes, intercepting traps, all properly ventilated, as it is only a question of care and protection from frost. Of course, all soil and vent pipes must be placed inside in this cold climate.

The British Association meeting this year is to be held at Winnipeg, under the presidency of Professor Sir J. J. Thomson, F.R.S., and it promises to be one of the most interesting of the long series of gatherings held under the auspices of the Association. The inaugural meeting will take place on August 25, when Professor Thomson will assume the presidency in succession to Mr. Francis Darwin, and will deliver an address. The following day the sectional meetings will commence, and the sitting will extend to September 1. Professor E. Rutherford will preside over the mathematical and physical science section. The other presidents of sections are:—Chemistry, Professor H. E. Armstrong; geology, Mr. A. Smith Woodward; zoology, Mr. A. E. Shipley; geography, Colonel Sir Duncan Johnston; economic science and statistics, Professor S. J. Chapman; engineering, Sir W. H. White; anthropology, Professor J. L. Myres; physiology, Professor E. H. Starling; botany, Lieutenant-Colonel D. Prain; agriculture, Major P. G. Craigie; educational science, Rev. H. B. Gray.

Mr. Thomas Mellard Reade, of South Blundellsands and Liverpool, architect and civil engineer, author of more than 200 pamphlets, Fellow of the Royal Institute of British Architects, who died on May 26, aged 77, left estate valued at 8,717*l.* gross, with net personalty, 7,247*l.* The testator left his geological and scientific pamphlets and specimens to the Liverpool University, free of duty.

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MECHANICAL VENTILATION.*

THE ventilation of buildings and other enclosed spaces has passed the experimental stage long ago, but the different opinions that exist and the frequent failures to obtain satisfactory results are sufficient to show that there is still much to learn regarding the general principles upon which the various methods rely for their efficiency.

No hard and fast lines can be drawn, and no system can be generally adopted in regard to ventilation, as the conditions vary so greatly. Even the strongest advocate of natural ventilation must acknowledge that the forces upon which he relies for efficiency are uncertain in their action and often quite beyond his control, even if he disregards the constantly varying amount of dust and moisture held in suspension in the outer air. The supporter of mechanical ventilation has also many difficulties to overcome, and failure often results, though he may have a free hand and almost unlimited means at his disposal. The amount of prejudice against mechanical ventilation is very great; this is due chiefly to the numerous failures to secure a perfect change of air and complete removal of objectionable atmospheric impurities. There is a wide field open for the expert who is able to secure perfect ventilation under all conditions.

It is now well known that for a healthy existence a man must have, amongst other things, a sufficient supply of pure air, but only by breathing in the open, away from all sources of contamination, can a perfect supply be assured. In densely populated areas it is impossible to obtain (under normal conditions) air free from impurities. The composition of pure air may be taken as:—Oxygen, 209.04 parts per 1,000 vols.; nitrogen, 790.6 parts per 1,000 vols.; carbonic acid or carbon dioxide, 0.36 parts per 1,000 vols. A quantity of water vapour is also present, but the volume varies with the temperature of the atmosphere. Minute dust is an invariable constituent of natural air, and some micro-organisms are held in suspension even under the best conditions. In the respiration of animals the air on entering the lungs comes in contact with the capillary blood-vessels of the lungs, diffusion takes place, heat is generated, oxygen unites with carbon, and carbon dioxide is formed; the latter along with the surplus quantity of air, and a considerable quantity of water vapour is expired.

The expired air is deficient in oxygen, is rich in carbon dioxide and in moisture. Organic matter is also present, partly in the form of vapour and partly in suspension in the solid state. The character of the organic matter is not definitely understood, but its presence is indicated by the peculiar unpleasant odour noticeable on entering an overcrowded room directly from the outer air. The offensive nature of the atmosphere of an unventilated room may be, to some extent, due to certain disorders of the digestive organs, the excretions of the skin and the soiled clothing of the occupants.

An adult man at rest consumes in twenty-four hours about 820 grams of oxygen; the quantity required for the same period is increased to 860 grams during ordinary occupations; thus a man exhausts and renders absolutely irrespirable 5 cubic feet of air per hour.

There are other agencies tending to pollute the atmosphere of enclosed spaces—namely, the use of gas and oil for illuminating and other purposes, the decomposition of organic matter, and the dust arising from many sources, frequently of a dangerous character.

The above brief statement clearly shows that provision must be made for the removal of foul air from all occupied rooms if the atmosphere is to be maintained in a normal condition.

A perfect system of ventilation should constantly provide:—(1) A sufficient quantity of air, equal in quality to external air under the best conditions; (2) freedom from draughts; (3) freedom from dust; (4) an even temperature sufficient to prevent discomfort during ordinary occupation of the room (the air must not be stagnant); (5) an even percentage humidity. In business premises special conditions, such as an abnormal temperature and a high percentage of moisture, may be required. No system in use to-day entirely satisfies the ideal conditions.

The supply of air by mechanical means to enclosed spaces occupied by human beings may be divided into numerous sections, but it will be sufficient at the present time to refer to the following:—The extraction of foul air, the propulsion of fresh air, the supply of air without artificial heating, the supply of hot air, the extraction of dust, the regulation of humidity, and the general distribution of air from one or more centres.

In the preparation of a scheme for the ventilation of a building it is necessary to adopt a standard of purity. The maximum accommodation of each room must be accurately determined. All sources of impurity must be ascertained and carefully considered, so that the volume of air required may be provided (though it may not be constantly required). The standard can be varied to suit the conditions of each case.

It has been clearly shown that when the temperature is normal the smell of organic matter is imperceptible when the carbon dioxide due to respiratory impurity does not exceed 0.2 parts per 1,000 parts of air in excess of that contained in fresh air; but above that quantity, especially if the temperature is raised, vitiation is perceptible; 0.6 per 1,000 is therefore taken as the maximum amount of carbon dioxide admissible in a properly ventilated room.

The possibility of an increase of the temperature and an additional percentage humidity resulting from the occupation of the rooms must not escape attention.

In every case the mechanical means employed (fan or air propeller) must be sufficiently powerful to move the quantity of air necessary to maintain the standard adopted.

If the change of air is to be effected by the extraction of the vitiated atmosphere from the premises, the openings provided for the admission of air must be sufficiently numerous and situated in positions that will secure proper distribution of the incoming air. The openings should be large enough to supply the volume required at a low velocity, to prevent draughts. The air may be heated by radiators and screened by sieves at the point of entry if necessary.

The areas of the openings nearest to the extractors should be capable of adjustment, so that the volume flowing to the outlet may be drawn from all parts of the room. The retarding influence of friction must never be overlooked. In large rooms the provision of inlets and mechanical extractors in the outer walls only does not give satisfactory results; arrangements must therefore be made by the introduction of ducts to prevent the accumulation of stagnant air about the centre of the apartment.

The systematic propulsion of fresh air into enclosed spaces from one or more centres offers better means for thorough ventilation. The air being distributed through ducts and discharged at suitable positions through openings of the required size, tends to greater efficiency than results from the adoption of simple exhausting appliances. If the air is to be heated before it enters the room the ducts must be doubled, each one being sufficient separately to supply the required volume of air. This may seem to be a costly arrangement, but in large buildings it is impossible to supply air of even temperature to a number of rooms situated at varying distances from the heating centre from a single duct. The loss of heat during the transit of the air will be sufficient to prevent uniform heating of the various rooms.

In buildings ventilated and heated from single ducts the rooms near the source of heat are supplied with air at high temperature and frequently become too hot. The occupants entirely or partially close the openings, and thus interfere with the efficiency of the ventilation arrangements. In rooms a considerable distance from the heating chamber the air supplied is too cold, and the opening from the duct is closed on that account.

The double-duct system has overcome the difficulties mentioned. Each duct should be fully charged with air under the pressure required to supply the full volume to each room, so that the occupants may draw hot or cold air to maintain a desired temperature, but no interference should be possible with the regular volume discharged into the room. The occupants of apartments near the heating chamber require a small quantity from the hot-air duct and a large volume from the cold-air duct. In other rooms the opposite may be necessary, as the hot air available will be at a lower temperature if the distance from the source of heat is increased.

In almost all systems which combine mechanical propulsion with heating, serious difficulties arise regarding the delivery of air into the rooms. In all cases the size of the ducts is reduced to a minimum on account of cost; the pressure and velocity of the air which they contain is greater than would be necessary if larger ducts were provided. That causes the air to flow through the openings into each room at a high velocity.

In a well designed and properly managed system for ventilating by propulsion, the impure air of our manufac-

* Abstract of a paper by Prof. J. Radcliffe, Municipal School of Technology, Manchester, read at the summer meeting of the Institution of Heating and Ventilating Engineers at Manchester, June 22.

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turing towns may be freed from a large percentage of the solid impurities it contains by screening or washing, but washing is not sufficient to entirely free the air from suspended matter. The removal of fog from the incoming air may be effected by careful management of the appliances.

In this country there is a constant variation in the quantity of moisture contained in the atmosphere. No serious attempt has yet been made to regulate the moisture in air for ventilating purposes. The percentage of saturation of the incoming air does not remain the same when the air has passed the heating chamber of a mechanically ventilated building; there is therefore a strong tendency by the heated air to take up moisture from all available sources unless some provision is made regarding it. Experiments have shown that a standard of moisture may be as easily fixed as a standard of temperature. Though the moisture added by the occupants of each room should be taken into account, reliable wet and dry bulb thermometers in each room materially assist in judging the atmospheric condition.

Unless the appliances (of all kinds) used for the ventilation of any building are intelligently designed and managed, failure is sure to be the result.

Mechanical ventilation requires a sufficiently powerful plant and careful attention by men who know the object in view, and with an interest in the success of the effort to secure a sufficient supply of pure air for those housed in the building.

Natural ventilation is desirable whenever possible, and it is suitable for many kinds of premises; but there are often occasions when the atmospheric conditions are unkindly disposed toward it, and the assistance of mechanical appliances would be very acceptable.

SURREY ARCHÆOLOGICAL SOCIETY.

THE annual excursion of this Society for the present year was to Godalming, Dunsfold and Chiddingfold, and took place on Thursday, July 15. The members and friends assembled at Godalming railway station at 11.30 A.M., where vehicles were in waiting. As the excursion was largely attended on this occasion we would mention that this neighbourhood had been visited by the Society on several occasions formerly, and papers descriptive of Godalming will be found in the "Surrey Archæological Collections" published by the Society in Volumes IV. and VI. by the late Major Heales, F.S.A., on Godalming Church illustrated, and in Vol. VI. Mr. Ralph Nevill, F.S.A., gives an illustration of a mason's mark (quarter full size) in this church resembling a fish and a ring, very similar to that on an old tombstone in Stepney Church, which is said to be the origin of a legend in that locality called the "Fish and the Ring," and by a local tavern sign board misconstrued into the "Salmon and Ball." In Vol. III. of the "Surrey Collections" will be found an interesting article on "Richard Wyatt and his Almshouses" at Godalming, illustrated by the late Mr. Edward Basil Jupp; and in the "Herald and Genealogist" of June 1866, page 498, will also be found a still more detailed paper on "Richard Wyatt, Citizen and Carpenter," and his almshouses, by the editor of that magazine, Mr. John Gough Nichols, F.S.A. Some further "Notes on Godalming Church" will be found by Mr. Ralph Nevill, F.S.A., illustrated in Vol. VII. Also on "The Church Lands of Godalming," by Mr. S. W. Kershaw, M.A., and a list of the monuments in this church from "Manning and Bray" in this same volume, page 284. Leaving Godalming station at 11.40, carriages conveyed the members and friends to Dunsfold Church, where this building was further described by Mr. P. M. Johnston, F.S.A., architect; for a former excellent description of this interesting church by the late Mr. J. Lewis André, F.S.A., see "Surrey Collections," Vol. XIII., beautifully illustrated. The party, after luncheon at the Bricklayers' Arms Inn, Dunsfold, proceeded on foot (five minutes walk from the inn) to "Willards," an interesting half-timbered house, which was inspected by kind permission of Miss Bovill. Carriages were then resumed from Dunsfold Green to Burningfold. Here by kind permission of Mr. C. T. A. Robertson, his mansion, which still retains its early newel staircase and other features of interest were inspected, and a short sketch of its history given by Mr. H. E. Malden, M.A. Chiddingfold Church was next visited and described by the Rev. T. S. Cooper, F.S.A., the recent late hon. secretary. This extremely interesting church was visited by the Society many years ago, when a paper was read in it by the late Major Alfred Heales, F.S.A., which will be found published and printed in extenso in Vol. V. of the "Surrey Collections," and well illustrated. In his description the Major says:—"We next observe that the chancel arch is not in the middle of the east end of the nave, but on the south side; and next we shall remark the fact that the united width of the nave and aisles is within a fraction of the length of the nave, and consequently the ground occupied by the nave and aisles together is very nearly a square." In the same volume is also a paper by the Rev. L. M. Humbert, M.A., Rector, on "Notices of Chiddingfold and its Registers and Rectors." In it he says, "The marriages and burials commence with the date 1563, and the baptisms from 1573. The earliest marriage was that of Harry Peyto and Sybill Bradford, October 27, 1563."

Major Heales in his paper concludes, "The church contains no monuments whatever worth mentioning," and adds:—"Since the above was written and the locality was visited by this Society the church has been restored at great cost (chiefly by the munificence of a parishioner and member of this Society). So large a sum could scarcely have been expended without very considerable alteration in the structure, and consequently it has become doubly important to place its previous state upon record." At 4 P.M. the members and friends adjourned to the Crown Inn, Chiddingfold. This building, which dates from the fourteenth century, and is probably the oldest inn in the county, was visited and inspected, by kind permission of the proprietor. The Rev. T. S. Cooper here read a short paper on its history. After leaving the inn the party inspected, by kind permission of Dr. Nicholas F. Kendall, his house on Chiddingfold Green, which possesses some curious frescoes and other very interesting features, and permission was also obtained to visit the ancient house at the top of the Green, which was known in the fourteenth century as "Hanedmans." By the kindness of the Rev. T. S. and Mrs. Cooper, an afternoon tea was provided at Chiddingfold. At 5.50 P.M. carriages left Chiddingfold Green for Whitley railway station.

THE FILMOMETER.

AT a recent meeting of the Paint and Varnish Society at Painters' Hall, Little Trinity Lane, E.C. a description was given of the filmometer—an apparatus for testing the strength and elasticity of paint films. Mr. Cruickshank Smith, the President, mentioned the facts that led up to the presentation of the filmometer to the Society. There is an association in America known as the American Society for Testing Materials, one section of which is greatly interested in the testing of varnish films. Affiliated with the American Society for Testing Materials there is a technical and scientific society composed of members drawn from the paint manufacturers of the United States. In course of correspondence with the officials of this body some time ago, the technical director, Mr. R. S. Perry, offered to present to the Paint and Varnish Society an instrument which he has recently devised for the purpose of testing paint or varnish films in a practical way. The committee gratefully accepted the offer, and the instrument has been sent over.

There are two factors which enter into the question of the mechanical testing of paint films, namely, the strength of the film and the elasticity of the film, but as to the exact relations of these two factors and their respective influences on the durability of the paint film in service, the scientific work accomplished so far is not sufficient to enable one to express a very definite opinion. The results which Mr. Perry has been able to obtain have done something towards elucidating the problem, but before we can say much about the practical utility of the filmometer in testing paint films some practical work with it will have to be done.

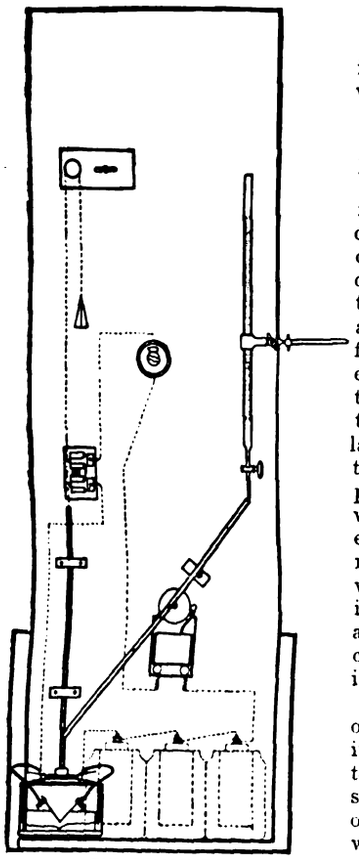
Members of the Paint and Varnish Society will be able to use the filmometer after it has been properly adjusted and put in working order, in accordance with rules which the committee will frame from time to time.

The following is an illustration and brief description of the filmometer as given by Mr. Cruickshank Smith:—The instrument consists essentially of a graduated upright tube seen on the left hand of the illustration. This tube is fixed by means of sealing wax to two circular brass plates between which the film to be tested is placed, and which are clamped together while the test is being conducted. These plates are bored with a hole vertically under the orifice of the upright graduated tube. This hole measures exactly one square centimètre in area, and is circular. The upright tube is graduated in lineal centimètres, and is called the pressure tube. The burette shown on the right of the illustration is also graduated in centimètres and contains mercury, which is conveyed by the side limb of the pressure tube to the latter,

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and is the means by which pressure is brought to bear upon the film under test. Above the pressure tube is fixed a wheel over which runs a thread terminating at one end in a metal rod with a float at the end. The metal rod and float extend to near the bottom of the pressure tube. To the other end of the thread is attached a counterpoise. Immediately under the openings of the metallic plates which carry the films are arranged two pieces of iron inclined at an angle of 90, and insulated by a thin piece of india-rubber. These two plates are connected up by wires with a pair of electro magnets shown above the pressure tube, the circuit being completed through an electric bell shown behind the side limb of the pressure tube and switch, shown in the centre of the diagram.

The film to be tested having been placed between the brass plates underneath the pressure tube, mercury is run into the pressure tube from the burette. As the mercury rises in the pressure tube it pushes the float upwards. When the weight of mercury in the pressure tube ruptures the paint film, the mercury falling on to the two insulated iron plates completes the electric circuit. The two small coils above the pressure tube become magnetised, and hold the metal rod firmly in position, thus enabling a reading to be taken of the height of the mercury accumulated in the pressure tube when rupture took place. At the moment when the coils become electrified, the bell rings, and the operator who is carefully watching the burette immediately turns off the stop-cock and takes the reading on the burette.



THE FILMOMETER.

Two readings are thus obtained, (1) the reading on the burette, (2) the reading on the pressure tube. The reading on the burette gives the weight of mercury necessary to rupture the film under the conditions of the experiment, while the difference between the readings of the burette and the pressure tube gives the volume due to the "sag" of the film, which is taken as a measure of its elasticity. In the case of perfectly non-elastic substances the readings of the burette and the pressure tube would, of course, always bear the same relations. Temperature is a most important factor in film testing experiments, and the experiments should be conducted at a uniform temperature. In America 70 deg. F. is the temperature that is usually adopted.

THE COMMERCIAL USES OF QUEENSLAND TIMBERS.

THE commercial uses to which the principal timbers of the colony of Queensland are put are many and various. Four varieties of ironbark—viz. white or grey, narrow-leaved, broad-leaved and red—are largely used for public works, preference being given to the white and narrow-leaved varieties. These timbers are used extensively in the building of bridges and culverts, for railway sleepers and fencing posts, and for framing, naves, spokes, poles and shafts in carriage and waggon building. Ironbark beams are of great strength, and are largely used for girders and joists of upper floors, especially in stores for heavy goods. Ironbark girders do not burn rapidly, and often stand fire when iron girders yield through the effects of the heat. Tallow-wood is strong, heavy, very durable, not easily split, and turns and planes well. It is used for bridge decking, house flooring, being peculiarly suitable for ballrooms, girders, piles and fencing posts, and especially for paving-blocks, giving even and regular wear under heavy traffic. Even better in this regard is blackbutt, a fine hardwood for house and ship building, as well as street paving. Grey gum makes excellent railway sleepers, and is used for felloes and spokes in coachbuilding. White mahogany and red mahogany are suitable for general building work, street paving, fencing and weather boards. It is exceedingly durable, and hardens greatly with age. Grey box is durable in contact with the ground, and when used for railway sleepers lasts from thirty to thirty-five years in the track. Woolly butt is used for house building, fencing and wheelwrights' purposes, and, being durable in contact with the ground and resistent to heavy traffic, is used for street paving. Spotted gum is one of the best hardwoods for bending, even when cold, and is therefore specially valuable in shipwrights' and coachbuilders' work, ship planking, decking of bridges and wood paving. Turpentine is of great durability in the ground or under water, being used for piles of jetties, &c. Blue gum is a valuable timber, with straight, symmetrical bole, and is used for upper timbers and decking in bridge work, vehicles and buildings. Messmate is largely sawn by mills for weather boards, &c., and string bark is sawn for ordinary building timber.

The Moreton Bay or hoop pine is used for the interior work of buildings, butter-boxes and packing-cases. Brown pine is also used for interior work and also for bridge, jetty and pier piles. The red cedar is a timber of great beauty; it is easily worked and very durable, and is used for furniture and cabinet-making, doors, panelling and interior fittings generally. Rosewood is also easily wrought, and is used for furniture, turnery, carving, cabinet work, mouldings, planes, window joints, house fittings and wine casks. Red bean has a finely figured grain, and is an excellent furniture wood. White beech is durable and easily worked, and is in great request for decks of vessels, furniture, picture frames, carving, flooring, house fittings, vats, casks and general coopers' work. Silky oak is also in demand for coopers' work, and it also makes handsome furniture and wainscotting. This timber is also used for butter-kegs, buckets, churns, &c., and makes good butter-boxes for the local markets. Black bean or Moreton Bay chestnut is used for furniture, cabinet-making and gunstocks. Tulipwood is highly esteemed for cabinet work, being used for door panels, dadoes and billiard tables.

GAS HEATING RESEARCH.*

(Continued from last week.)

THE room was as large as the available space allowed—viz., 9 feet by 9 feet by 9 feet, with an internal capacity, after allowing for the various articles in the room, of 710 cubic feet. Only one side was easily accessible, and in this side double doors connected with an air-tight passage gave access to the interior without danger of cold air suddenly entering. The rest of this side was fitted with shelves, both inside and outside, on which apparatus could be placed. There were two windows (14½ inches by 10 inches) immediately above the shelves, so that the apparatus could be watched from outside.

Air was admitted through movable panels 10 inches square at the top and back of the room; and the products of combustion were carried away through a square flue placed at the opposite side of the room near the ceiling. This flue was connected with the chimney of the outer room—an ordinary kitchen chimney. As it was important that this flue should be quite air-tight, the inner lining was made of galvanised sheet iron. So that the combustion products might be drawn away if required at a uniform rate a small electric fan was used and fitted exactly into the outer end of the flue. This could be run at either a high or low speed. This, as well as the electric lights within the room, was controlled by switches from outside.

The gas supply pipe passed into the room through a panel, and was directly connected to the test-meter, standing on a shelf outside the room. This in its turn was connected through a Stott's governor with the house supply meter.

The flue inside the room was made of sheet copper, wrapped with asbestos board in order that there should be as little loss of heat as possible from the flue gases before

* Extract from report of the Gas Heating Research Committee appointed by the Institution of Gas Engineers in conjunction with the University of Leeds, and consisting of Messrs. John Bond, J. H. Brearley, and Charles Wood, in co-operation with Professors Arthur Smithells (Chairman), William A. Bone, and Julius B. Cohen, of the University of Leeds, and Mr. E. W. Smith (Research Chemist), to the Institution of Gas Engineers, at their Annual Meeting held in London during June 1909.

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they passed into the kitchen flue, outside the experimenting room. The flue left the room by means of a hole 8½ inches square, 8 feet 4 inches from the ground. Its cross section dimensions were 6 inches by 4 inches, and at the point where it left the room its cross-sectional area might be reduced either to 4 inches by 4 inches or 3 inches by 3 inches. At this point, too, an electrical resistance thermometer was brought into use—this being connected with a Callendar recorder, erected in the main buildings. Arrangements were made that samples of gases might be drawn from the room from immediately above the stove, and from the flue near to the thermometer. This was done by means of aspirators, in which the volume of gas abstracted could be measured.

Method of Estimating the Rate of Air Change in the Room.—The chemical method was adopted for the estimation of the rate of air change in the room as being likely to prove the most accurate for the work in hand. The mode of procedure was as follows:—

1. A determination was made of the carbon dioxide contents of the outside air in parts per 10,000 (Pettenkofer method, modified).

2. A sample was taken extending over the whole time occupied in doing the ventilation experiments (fifteen to twenty hours) of the gases passing up the flue, and the carbon dioxide contents determined in parts per 10,000.

3. The gas-rate in cubic feet per hour was accurately determined and reduced to 0 degs. C. and 760 mm. pressure, dry.

4. A sample of the gas burnt was abstracted from the main before entering the test meter, during the whole experiment. This was exploded with oxygen in a "Bone and Wheeler" gas analysis apparatus, and the amount of carbon dioxide formed from the combustion of a cubic foot of the consumed coal gas estimated.

From (4) and (3) was estimated the volume of carbon dioxide (at 0 deg. C. 760 mm. dry) passing into the flue per hour. Then if (1) = x; (2) = y; (4) = z; and if the volume of air passing up the flue per hour equals "v," then

$$v = \frac{z}{y-x} \times 10{,}000.$$

Carbon Dioxide Determinations.—Pettenkofer's method was employed with the modifications proposed by Letts and Blake.* These consisted (1) in coating the inside of the sampling vessels with paraffin wax to prevent the glass being attacked by baryta solution, and (2) carrying out the titration in a vacuum. A further modification consisted in having a soda lime tube fitted to one of the holes in the corks of the sampling bottles, and also a three-way glass tap. The same was done with the titration flask. By this means atmospheric carbon dioxide was prevented from entering these vessels should the gases contained contract owing to a fall of temperature in taking them into the laboratory, which remained fairly constant between 56 degs. Fahr. and 60 degs. Fahr. The results obtained by this method were checked by a gravimetric determination, by drawing a sample over calcium chloride, sulphuric acid, caustic potash, and soda lime. They were not found to differ seriously. The samples of flue gases were always analysed gravimetrically.

Carbon Monoxide Determination.—The flue gases were also analysed for carbon monoxide in most experiments, as were also the gases abstracted from immediately over the stove. The method depending on the liberation of iodine from iodine pentoxide by means of carbon monoxide, and the formation of carbon dioxide, was adopted.

$$5\,CO + I_2O_5 = I_2 + 5\,CO_2.$$

The amount of change was estimated colormetrically by absorbing the iodine in chloroform and comparing the solution with equal volumes of standard solution. This method was open to slight error, as the iodine pentoxide was liable to be reduced by other constituents in the sample than carbon monoxide, as, for example, by formaldehyde, the presence of which in the products of combustion was most probable. The quantities of carbon monoxide found in all cases were so small that, assuming the whole of the change was caused by this gas, the figures are sufficiently convincing to show that during the course of these experiments only negligible quantities were formed, if any at all.

Hygrometric Measurements.—Wet and dry bulb thermometers, previously tested, were placed inside and outside the room in order that the percentage saturation of the inner and outer air might be determined. Glaisher's tables were used. Both hygrometers could be read from outside the room.

Sulphur Determinations.—The Gas Referee's apparatus was open to two likely sources of error—firstly, in the incomplete oxidation of the sulphur, and, secondly, by contact of the hot parts with rubber containing sulphur. An apparatus was designed in which all the connections were ground glass joints, and in which the combustion products were led over hydrogen peroxide solution and cooled by passing through a water-cooled condenser tube. The results obtained were higher than those got by the Gas Referee's apparatus.

(To be continued.)

* Cf. *Proceedings of the Royal Society of Dublin*, 1900, p. 107.

COMPETITION RESULTS.

THE Bootle Town Council at their last meeting approved the education committee's recommendation that the plans selected for the proposed new Balliol Road Council school should be provisionally adopted. On the sealed envelope being opened the successful architects were announced to be Messrs. Medcalfe & Medcalfe, Moorfields, Liverpool.

The plans of Messrs. Thos. Bower & Edleston, Bank Chambers, Nantwich, have been selected for the Nantwich cottage hospital to be erected at Henhill. The hospital will, it is estimated, cost 2,142*l.*

Mr. F. Q. Farmer, architect, Stalybridge, has been awarded the first premium of 15*l.* 15*s.* in a competition for a Council school to accommodate 850 children at Mossley, Lancs. The second premium of 5*l.* 5*s.* goes to Messrs. J. Gunson & Son, architects, Manchester.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect*, continuing its account of architecture in the Southern States, gives an account of "a day at Williamsburg," an old town of Virginia, "whose whisperings of a mildly frivolous yet intense past have not been drowned in the roar of modern progress," whose courthouse is ascribed to Sir Christopher Wren, and whose buildings are practically all of the "Colonial" period. As a contrast, and a not altogether pleasing one, is illustrated a modern house in Atlanta, which for incorrectness of grammar without force of diction would be hard to beat. A luxuriously enriched alteration to a New York house for E. F. Whitney, Esq., is also illustrated.

La Construction Moderne illustrates details of the interior of the Bureau de Poste of the Maison Dorée at Paris, of which Mr. R. Binet is the architect, and which is a curious mixture of modern Parisian architecture and reminiscences of French Gothic. It is amusing to note that the sculptors, MM. Moreau-Vauthier & Guillot, symbolise London in the guise of a modern lady habited in winter walking costume on a windy day, with muff and boa and a "Merry Widow" hat.

Deutsche Bauzeitung is occupied with a burning question, the erection of a new police building on the site of the old Augustinian church in Munich, and the competition designs for this new building are illustrated, with a discussion for and against the retention in whole or in part of the old buildings. The first prize design is by Messrs. Delisle & Ingwersen, of Munich; the second by Messrs. Hessemer & Schmidt; and two third prizes are awarded to Professor Dr. Theodor Fischer, of Munich, and to Messrs. Scholer and Professor Bonatz, of Stuttgart.

Innen-Dekoration illustrates the exterior as well as the interior of the Märkische Museum at Berlin, designed by Stadtbaurat Ludwig Hoffmann, in which archæological correctness is adopted with the view of fitting the casket to the jewels it contains. This leaves little room for a residence at Grunewald and for furniture designed by de Feure, of Paris, in which latter simple forms with varied inlays are excellently treated.

Der Architekt gives a continuation of Professor Adolf Hölzel's article on the use of the executive arts in connection with architecture, and now treats of wall painting with special reference to the decorations of the so-called "Pfullinger Hallen," a building comprising concert rooms and theatre. The remarkable Karl Borromäus fountain at Vienna is excellently illustrated, the architect being Josef Plecnik, and the sculptor Josef Engelhart. Two designs by Franz Matouschek, of Budapest, are noteworthy, the one for a Jewish synagogue at Trieste, the other for an artist's house at Budapest.

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Der Profanbau brings before us some of the modern castles erected from the designs of Professor Bodo Ebhardt, of Grunewald, Berlin—namely, Gröditzberg, Landonvillers, Die Marksburg am Rhein, Altenburg, which are admirable reproductions of the spirit and forms of old German fortified houses.

The *Engineering Record* (New York) describes the construction of the Boston Safe Deposit and Trust Company's building, a new "steel-cage" structure occupying an approximately rectangular area about 122 feet by 125 feet, with ten floors above the street level and two below. An account is given of a difficult piece of underpinning work to a leaning chimney of reinforced concrete 108 feet high in Jersey City.

Correspondence

[*The Editor will not be responsible for the opinions expressed by Correspondents.*]

Architectural and Topographical Society.

SIR,—May we venture through your columns to appeal for help in a work which has been described as one of national interest—namely, that of making complete historical records of the ancient buildings of these islands, from the introduction of civilisation to the year 1800, which has been undertaken by the Architectural and Topographical Society?

The need for such a work has been admitted on all sides, and ought to have been undertaken long ago, for it is now almost impossible, after a century or more of destructive so-called "restoration," to obtain exact information as to the previous condition of much of our historic architecture.

Although this Society is unable to act in any manner directly calculated to prevent such destruction, yet by recording precisely and in detail the present state and the nature of the buildings and the monuments, it is able to some extent to counteract the effects of such vandalism, and owing to the low rate of our subscription (*i.e.*, 10*s.* 6*d.* per annum), and the consequent accessibility of our publications to all, there is a potential educational value in our work.

These considerations form an overwhelming argument in favour of so low a subscription, but it is obvious that the expenses of printing and publishing records of buildings with sufficient illustrations fully to explain the text must be practically the same whether the circulation be 200 or 1,000; therefore the ratio of revenue to expenses must, until the subscription list approaches the latter figure, be too low to make the Society self-supporting.

On these grounds alone we might venture to trouble you, and through you the public, but we would at the same time lay additional stress on the following points, *i.e.*:—

1. Since the foundation of the Society, rather more than twelve months ago, complete accounts of the buildings in seventeen parishes have been published.

2. The value of the work has been endorsed by the fact that many of the leading societies interested in this subject are now subscribing.

3. There are at present some twenty parishes partly completed, in addition to those already published, and several more are definitely promised. The fact that the Society can obtain work of this nature entirely gratuitously shows how greatly the need for such records is felt by those who have expert knowledge of the subject.

4. The recent appointment of Royal Commissions to make an inventory of the ancient monuments of England, Scotland and Wales shows that the State appreciates the need for such work; and by its terms of reference the Commission is only intended to make an inventory, and does not in any way cover the ground of this Society's labours.

5. The other part of the Society's work, which includes the collection of carefully made record drawings, notes and photographs, &c., is progressing, and a considerable number of such records are now either promised or are already in our possession.

6. All the work done for the Society is purely honorary, therefore its funds are expended entirely on the work and not in any way upon the workers.

7. A large sum of money is subscribed annually towards the furtherance of similar work in the ancient world of Egypt and Rome, and it would be unworthy of our national traditions should researches into the history of our own country fail for want of funds.

The minimum sum of 500*l.* is required to ensure the effective continuation of the work of the Society until such time as the annual subscription list shall be equal to the necessary disbursements; a further contribution would enable the rate of progress to be made more consonant with the amount of the work to be done.

In conclusion, we would appeal to all who take an interest in the history of their country to help the work in some degree. Subscriptions and donations should be made payable to the Society, and crossed "London and County Bank."

All communications should be addressed to the offices of the Society at 33 Old Queen Street, Westminster, S.W.

Donations will be treated as subscriptions, and donors of half a guinea or more will receive the record for the current year, whilst those of seven guineas and upwards will be entered on the Society's list of life members.

PLYMOUTH.
AVEBURY.
ASTON WEBB, R.A.
FRANCIS BOND.
J. A. GOTCH.
EMSLIE J. HORNIMAN, M.P.
THOS. G. JACKSON, R.A.
MERVYN MACARTNEY.
EDWARD S. PRIOR.

33 Old Queen Street, Westminster, S.W.
Mr. Wilfred Travers, A.R.I.B.A.,
General Hon. Secretary.

Coal Smoke Nuisance.

SIR,—Your report of the meeting of the Institution of Gas Engineers is lying before me, in which reference is made to the great influence that improved types of gas cooking and heating stoves are likely to have in the near future upon the purifying of the air. As mentioned in your summary of the address, all gas companies produce coke, but it is sometimes seen that these gas companies have difficulty in disposing of their coke productions at a remunerative figure. Undoubtedly it is in the interest of all gas companies to increase the market for their gas rather than seek markets for their by-products, such as coke, but several gas companies have, with praiseworthy foresightedness, introduced in their towns stoves constructed specially to burn coke, and it has been found that many people who have objections to the use of gas stoves have used with readiness stoves to burn coke, because of the well-known fact that coke is cheaper than coal.

During last winter I had a stove which I kept burning night and day continuously through six months. It was heating a room of about 3,000 cubic feet at an average cost of 1*s.* 6*d.* per week, and required replenishing with broken coke not oftener than twice every twenty-four hours.

I think if the public were educated to appreciate the advantages of burning coke in a closed stove, the open-fire grate would soon be a thing of the past.—Yours faithfully,

HERBERT TEELING.

Heriot Hill House, Canonmills, Edinburgh:
July 8, 1909.

Influence of Material.

SIR,—Whilst interested in reading Mr. Aitken's reply to my letter on proportion in architecture, I find nothing in it to modify my views. Is it not, in the first place, apparent that it is possible to triangulate every façade after some fashion, and that the mere fact of so triangulating does not connote studied proportions? Further, the idea as to "correcting imagination by the application of geometry" presupposes a fundamental artistic value in the latter science—a supposition that is absurd. Mr. Aitken continues:—"Imagination alone may lead to eccentricity." *Good* imagination may be safely trusted to its own guidance; and feeble imagination, even conjoined with geometrical rules, will never produce fine art.

Again, we are told that of two Ionic buildings one is triangulated with 60° and 30° and the other with 45°, both of them admittedly fine buildings. How does this help Mr. Aitken's argument as to the Parthenon, "which, *when compared with similar buildings of its style*, holds the field for beauty of proportion?" The italics are mine.

Mr. Aitken's suggestion as to coincidences and accidents deserves comment. When you do not obtain two buildings in a style agreeing in triangulation, there is no coincidence; and it is only on obtaining numerous according "accidents" that the latter become coincidences and may merit consideration as rules. The "method that was apparently employed

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to fix the diameters of columns both Classic and Mediæval" does *not* merit serious consideration, being one that, in the language of triangulation, is equivalent to going two sides of a triangle to reach the further point, instead of negotiating the hypothenuse.—Faithfully yours,

49 Queen Victoria Street, E.C. PERCY L. MARKS.

Middlesbrough Library Competition.

SIR,—We have now received the following reply to our letter of the 30th ult. from the Royal Institute of British Architects in regard to the above competition:—

"July 9, 1909.

"Middlesbrough Library Competition.

"Dear Sirs,—I am desired by the Council of the Royal Institute to inform you that your letter of June 30, addressed to the President of the Royal Institute, has been laid before them by the President, and as a result of their inquiry into the subject of your letter I am to inform you that the decision of the competitions committee has the approval of the Council.—Faithfully yours,

(Signed) "IAN MACALISTER,
"*Secretary.*

"Messrs. Hoskins & Brown, Kitching & Lee, and W. H. Bourne, Houndgate Chambers, Darlington."

We now propose taking counsel's opinion as to the position of the competitors in this competition.

Would those architects who signed the memorial, who have not yet forwarded the 5*s.* asked for, for preliminary expenses, kindly do so at once.

We should also be pleased to receive subscriptions from any other architect who sympathises with the object in view.

Any future action, after counsel's opinion is obtained, will be left to the subscribers.

Whatever counsel's opinion may be, architects will at least have the opportunity of knowing their legal position in future competitions.—Yours faithfully,

HOSKINS & BROWN,
KITCHING & LEE,
W. H. BOURNE, A.R.I.B.A.

Houndgate Chambers, Darlington: July 12, 1909.

The Improvement of London.

SIR,—The very interesting accounts which have just been published of the enterprise of Mr. Charlton Humphreys, in acquiring the freehold of the Knightsbridge estate, must cause those who have an eye for the improvement of London to see visions. One of the first possibilities to suggest itself is the transfer of St. George's Hospital from its extremely valuable, but, for the purposes of a hospital, most unsuitable site, to the quiet situation of Trevor Square.

Such a change would, at one stroke, advantage a great public charity and make available the unique site at Hyde Park Corner, in many ways the most conspicuous in the metropolis, for an opera house, or other building of like character.

London is indebted to the private enterprise of her great landlords for the squares, which are some of her chief adornments. May the private enterprise of Mr. Charlton Humphreys be equally beneficent.—I am Sir, yours faithfully, MARK H. JUDGE.

7 Pall Mall: July 10, 1909.

Guild of Architects' Assistants.

SIR,—Many thanks for the publication of my letter *re* the Guild of Architects' Assistants, but I should like to point out what appears to be a printer's error. In the third paragraph from the bottom the word "decreasing" competition appears instead of "increasing," which spoils the sense of the sentence.

I hope that in my letter I had not made that mistake.

In any case, perhaps you would kindly draw attention to this in your columns, and oblige, yours faithfully,

HERBERT COX.

10 Mecklenburgh Street, Mecklenburgh Square, London, W.C.: July 14, 1909.

SIR,—The letter from Mr. Herbert Cox in your issue of the 9th inst. is, if I may say so, admirable good sense. But in the third paragraph from the end the logic seems somewhat at sixes and sevens, unless, as I surmise, there is an error in one word. Surely Mr. Cox meant to say "increasing competition between assistants," not "decreasing." Unless this be so, the paragraph seems to be perilously near nonsense. Perhaps you or Mr. Cox will clear this up.

The Guild appears to be a successful attempt to do what has been tried many times before without success, and if assistants realise that their interests are clearly served by joining, and thus supporting each other, its success is assured. At the same time there is no reason for thinking that the interests of principals are opposed to those of assistants who are members of the Guild, and nothing but value to both should accrue when the Guild is on the high road to success if its management keep the common interest in view.—Yours faithfully,

E. GODFREY PAGE, A.R.I.B.A.

2 Old Serjeants' Inn, Chancery Lane, E.C.

[We have looked up Mr. Cox's letter, and find that he wrote "increasing," and the printer has made it "decreasing."—ED.]

GENERAL.

The Wolverhampton Town Council have decided to confer the freedom of the borough upon Sir George Hayter Chubb.

Stoke Park, the former home of the Penn family, has been altered to form the club house of the Stoke Poges Golf Club, and it was formally opened on Monday last. The house was originally a square red-brick eighteenth-century building, the successor to the old Tudor manor house still standing in the park, but it has been enlarged from time to time, and some fine reception-rooms, quite suitable for the purposes of a club, have been added. The present alterations have been confined mainly to the bedroom floors and the basement, and to the building of a caddie master's house, the exterior with its symmetrical wings and central dome, and the long columned loggia facing the terrace being left quite unchanged. The gardens, which are of the landscape type, are very fine of their kind, and the park forms an ideal golf course. The general contract has been carried out by Messrs. Shoolbred & Co., the hot water and cooking apparatus by Messrs. Wilson & Smith, the drainage and other sanitary work by Messrs. Fleming & Co., and the electrical plant and wiring by Messrs. F. A. Glover & Co. The architect for the work was Mr. Arthur Keen, F.R.I.B.A.

The West Riding Finance Committee have arrived at the conclusion that the work under the Education Acts is sufficient to absorb the entire time and attention of a competent architect. They therefore recommend that the West Riding architect's department be reorganised and divided into two sections, each to be under a competent architect, one to take charge of the work of the education committee, the other to take the rest of the work; that the salary of Mr. J. Vickers Edwards, the West Riding architect, be reduced from 1,500*l.* to 1,000*l.* per annum as from January 1, 1910, provided he agrees that he will not make any claim for compensation by reason of such reduction, and that an architect be appointed to carry out the work of the education committee at a salary not exceeding 500*l.* a year. The above recommendations were discussed for two hours on Wednesday, and the County Council finally decided that Mr. Vickers Edwards should be asked to retire, and that the finance committee should be authorised to fill up the vacancy at a salary of 700*l.* a year.

The Royal Institute of Painters in Water-Colours at a general meeting held last week elected Sir James D. Linton president in place of the late Mr. E. J. Gregory, R.A.

The Volunteer Workers who are excavating on the site of the ancient abbey at Bardney, near Lincoln, have made further interesting discoveries. The west front of the church, including the west door, with beautiful carving, is now bared, and a stone in memory of the twenty-seventh abbot of Bardney has been brought to light. This measures 8 feet 4 inches by 3 feet 8 inches, and is in splendid preservation. A figure of the abbot is delicately carved in the centre, and there is an inscription stating the time of death, October 1, 1508, &c. The members of the Royal Archæological Society are to visit the abbey in the latter part of this month.

The London County Council in March 1908 decided to award annually three scholarships tenable for three years at the School of Art Woodcarving, South Kensington, subject to regulations which provided that the scholarships should not be awarded upon a competitive examination, but by nomination upon consideration of the candidate's general capacity and manual and artistic skill. The number of candidates has increased this year, and it seems probable that in future years it will still further increase. In order to limit the number of candidates to be interviewed, it is recommended that they shall be required to take an examination in drawing and modelling, either from common objects, plant form, or from ornament, flat copy or cast, and, if thought advisable, only those candidates who attain a certain standard in the examination need be interviewed.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, July 24.

Architectural Association. Third Summer Visit to "Ardenrun," near Godstone, Surrey (a house by Mr. Ernest Newton).

Royal Archæological Institute. Annual Meeting at Lincoln, July 23 to July 30.

Town Planning and Housing Exhibition, Hampstead. Lecture on "The Conditions of City Development," by Professor Patrick Geddes.

Monday, July 26.

Builders' Benevolent Institution: Annual General Meeting and Committee Meeting.

Tuesday, July 27.

Kent Archæological Society: Annual Meeting at Museum Buildings, Maidstone, July 27 and 28.

Wednesday, July 28.

Town Planning and Housing Exhibition: Lecture on "Architecture and Town Planning," by Mr. W. Woodward, F.R.I.B.A.

Saturday, July 31.

Architectural Association Camera and Sketching Club Summe Continental Excursions: Caudenbec and District, July 31 to August 7.

STUDENTS' DRAWINGS AT THE ARCHITECTURAL ASSOCIATION.

THE drawings now on view at the Architectural Association, Tufton Street, Westminster, are illustrative of part only of that body's teaching, being practically a sample of the work that is done in the studio, whether in the day school or in the evening school. It is a pity, and it reflects discredit on the Association, that the drawings are not more carefully hung, particularly with regard to the work of the evening school. No sort of system is adopted, and it is most irritating to a visitor who wants to follow the progress of the students during their year's work to find drawings hung in a haphazard fashion. To begin with, it is a matter of the utmost difficulty to find out who is the author of any particular drawing. Nine times out of ten the author's name is covered up, drawings being pinned over one another as if the A. A. could not afford an extra eighteenpence for another gross of drawing pins. Then one finds that one man's drawings for a particular subject are interspersed with somebody else's, not necessarily even of the same subject. It looks as if the masters had selected a certain number of drawings and left it to the most junior clerk in the office to hang them, which he did haphazard and as they came.

Obviously there are two systems either of which might have been satisfactorily adopted for arranging the drawings. We might have had each student's work by itself shown chronologically in the order of its production. Then we should have been able to see the value of the instruction given, and observed how each man had made progress during the session, a useful criterion of the value of the instruction and the receptivity of the individual for that instruction. On the other hand, the drawings might have been arranged under subjects, then we might have estimated the comparative merit of each student's work in the treatment of each particular problem, and we might have expressed our personal opinion as to the correctness or otherwise of the awards of the prizes. We trust that the award of prizes was made before the drawings were hung, for we defy anyone to make a just estimate of the work done by the students from the drawings as exhibited. Accordingly we decline to express any opinion as to the justness of the awards beyond this, that in several instances in particular subjects we have seen better designs submitted than those of the prize-winners. We quite recognise that in awarding prizes for a session's work in a school, quantity counts to some extent as well as quality, so that a student who has made six designs worth five marks each stands higher than one who has done three designs worth nine marks each, although the latter is far the better man.

The predominant impression that we gather from a very careful inspection of the drawings exhibited is that effective prettiness in draughtsmanship is the chief aim in the A. A. studios. It looks as if the students were encouraged tacitly, if not openly, to think more of tricky drawing than of excellence in the real qualities of design. In a school of architecture this is wrong, albeit it may turn out men who although not great architects may catch clients, especially lady clients. The A. A. students, unless they advance beyond what they are now learning in the studios, will not win competitions, but with a good connection and a plausible manner they may make a decent practice, for there are plenty of people in Great Britain who cannot appreciate good design but may be caught by a pretty drawing. Hence the A. A., on its present lines, is turning out those who with luck and sufficient opportunities, may become successful practitioners, but will never be great architects.

In the work of the day school, which is classed under first year and second year, we have presumably that produced by the best students from amongst those who have come straight from school to professional study. The method of instruction is well arranged: first, the embryo architect is taught to make measured drawings of the studio in which he works, and freehand drawings of its furniture; then he makes a complete set of drawings from buildings already carried out by good architects of our own time, and studies of some of the great works of antiquity. In his vacations he is encouraged to make measured drawings of old work. We were pleased to see an isometric drawing of a Greek Ionic cap; such an exercise is worth dozens of reproductions of elevations of the orders from MAUCH or SPIERS. But even in the work of first-year students, the merest tyros in architecture, there is a striving after the pretty drawing, after tricks of draughtsmanship whether in pencil or in colour. Perspectives do not correctly show the building as it is in the plans and elevations, but they are pretty. In the second year a day school student begins to design and exercises himself on such academic subjects as a Greek Agora in Doric style and a Roman bath in Ionic, as well as more modern subjects, as a group of labourers' cottages. A Roman hall and a domed church were also set for design, the latter rather an ambitious subject, though well tackled by Mr. F. A. CROUCH in particular. Still the fatal prettiness of draughtsmanship is more evident than solid excellence of design. Details

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of construction are also studied partly from actual observation.

The end of session test, a "Study for a Country Cemetery Entrance Lodge," affords a means of judging how far the students have learnt to design and what they can effect when left to their own devices and deprived of the criticism, suggestions and assistance of a master, which we understand goes so far as the inclusion of actual handiwork by the instructor on a student's drawing. The result is not very satisfactory. The study placed first, that by Mr. H. B. CHISHOLM, is modest and not a very remarkable production for five days' work. It is, however, the best. The study placed second, which is by Mr. S. J. H. PRYNNE, is more ambitious but less successful. Ambition is not a bad fault in a young aspirant. "Who aims the sky, although he do not hit his mark, shoots higher far than he who aims a tree." Of the studies receiving honourable mention we can but say that the drawing is better than the design.

Coming to the work of the evening school, whose students are presumably those engaged in architects' offices, either as pupils or assistants during the day, and possibly of more experience than those in the day school, we cannot fail to notice a better quality than in the work of the latter, noticeably in the second year, where we find at least in one instance the same subject treated. As we have already said, owing to the unsatisfactory manner in which the drawings are hung it is hopeless to attempt any fair comparison of the work of various students, or to estimate the advance they have made during the session. All that we can do is to point out some of the good work shown. In the second year the drawings for a village church, by Mr. H. D. KIDD and Mr. A. T. HARDMAN, are both deserving of mention. In the third year work there are designs for the re-arrangement of the Marble Arch and its surroundings that put to shame the scheme actually executed. The work of Mr. P. D. HEPWORTH, who wins the scholarship, is good, particularly his design for a country house, whilst Mr. O. F. HILL'S school memorial hall is well worthy of notice, although that gentleman's name does not appear in the prize list, even to the extent of honourable mention. Similarly in the fourth year, although the work of Mr. C. A. FAREY, who is placed first, is distinctly excellent, Mr. SWINDELL, who is unmentioned in the list of awards, has produced commendable designs for a music room and for a riverside factory and warehouse. Draughtsmanship being as we have pointed out the goal of the A. A. studios, we should mention as striking examples Mr. A. D. ROBINSON'S detail of an Ionic cap, Mr. GORDON HAKE'S coloured perspective of the riverside warehouse, and Mr. PRYNNE'S drawing of a stone panel.

The list of awards in the schools is as follows:—

DAY SCHOOL.

FIRST YEAR AWARDS.—Book prize for first place in history test paper and general excellence in this subject, E. L. Apperly. Book prize for first place in construction test paper and general excellence in this subject, E. L. Apperly and R. C. Stevenson, equal. Geometry, first place T. F. Ford. Physics, first place C. Rowntree. A.A. sketch book for first place in freehand drawing, A. E. Maxwell. Prize for first place in perspective drawing test, E. L. Apperly. *The Studio Prize.*—Best portfolio of drawings made during session, R. C. Stevenson. Recommended for special prize for excellence, A. E. Maxwell. Hon. mention, E. L. Apperly, T. F. H. White, F. P. Spooner, C. Rowntree, L. M. Yetts and T. F. Ford. Authors of drawings selected for school portfolio, R. C. Stevenson, A. E. Maxwell, T. F. H. White, L. M. Yetts, E. L. Apperly, and T. F. Ford.

SECOND YEAR AWARDS.—Travelling studentship 15*l.*, for studio and lecture work during session 1908-09, holiday work and general progress, F. A. Crouch; specially commended, A. G. Butler; hon. mention for general progress during session, E. S. A. Baynes, C. W. Rogers, J. O. B. Hitch, B. P. Gaymer, J. A. Cheston, E. W. Mountford. *End of Session Test.*—Subject, "Study for a country cemetery entrance lodge," award made by Mr. Henry Tanner, President A.A. Study placed first, No. 5, H. B. Chisholm; study placed second, No. 17, S. J. H. Prynne; hon. mention, No. 14, L. D. Martyn; Nos. 21 and 20 equal, C. W. Rogers and B. Gaymer. Drawings selected for presentation to school portfolio, F. A. Crouch, A. G. Butler, E. S. A. Baynes, C. W. Rogers, J. O. B. Hitch and H. B. Chisholm. Students recommended for the Association two years' course certificate, E. S. A. Baynes, A. G. Butler, J. A. Cheston, H. B. Chisholm, F. A. Crouch, B. P. Gaymer, J. O. B. Hitch, L. D. Martyn, E. W. Mountford, C. W. Rogers, S. E. Shurmur and R. Talvalker.

EVENING SCHOOL.

SECOND YEAR.—1, D. J. S. Dawson, scholarship, 15*l.* 15*s.*; 2. H. D. Kidd, book prize, 2*l.* 2*s.*; 3. H. V. C. Curtis, master's prize for hardest worker; hon. mention, G. F. Rowe and A. T. Hardman.

THIRD YEAR.—1, P. D. Hepworth, scholarship, 15*l.* 15*s.*; 2. H. E. Moss, book prize, 2*l.* 2*s.*; 3. C. Castelow, master's prize for hardest worker; hon. mention, E. J. Hatherall, H. A. Thomerson, B. P. Collin, P. M. Andrews and H. A. Gold.

FOURTH YEAR.—1, C. A. Farey, scholarship, 15*l.* 15*s.*; 2, B. F. Matthews, book prize, 2*l.* 2*s.*; 3, R. M. Pigott, master's prize for hardest worker; hon. mention, L. K. Hett, G. D. G. Hake, A. D. Robinson, G. F. Clarkson and R. W. Cable.

LECTURES.

FIRST YEAR.—*Elementary Construction.*—1, Norman Keep, book prize; 2, R. Topham; 3, C. J. McCausland. *Plane and Solid Geometry.*—1, G. H. N. Inman, book prize; 2, C. J. McCausland; 3, Norman Keep. *Preparatory Physics.*—1, D. J. S. Dawson, book prize; 2, R. Topham; 3, A. L. Lucas.

SECOND YEAR.—*Intermediate Physics.*—1, F. A. Crouch, book prize; 2, R. Talvalker; 3, H. Burch. *Grecian and Roman Architecture.*—1, G. M. Eaton and R. N. Jackson, book prize; 2, F. A. Crouch; 3, C. W. Rogers. *Early Christian and Gothic Architecture.*—1, C. W. Rogers, book prize; 2, F. A. Crouch; 3, J. A. Cheston. *Renaissance Architecture.*—1, R. N. Jackson, book prize; 2, C. W. Rogers; 3, J. O. B. Hitch.

THIRD YEAR.—*English Architecture.*—1, P. J. Adams, book prize; 2, W. J. Durnford; 3, B. P. Collin. *Advanced Physics.*—1, W. J. Durnford, book prize; 2, R. A. Walter; 3, W. Roberts. *Materials.*—1, P. J. Adams, book prize; 2, W. J. Durnford; 3, R. A. Walter. *Drainage and Water Supply.*—1, H. A. Thomerson, book prize; 2, W. J. Durnford; 3, C. J. Newberry.

FOURTH YEAR.—*Ventilation, Lighting, and Heating.*—1, G. F. Clarkson, book prize; 2, H. A. Ross; 3, R. M. Pigott. *Iron and Steel Construction.*—1, G. F. Clarkson, book prize; 2, W. C. Rhodes; 3, C. F. Butt. *Advanced Construction.*—1, G. F. Clarkson, book prize; 2, B. F. Matthews; 3, R. M. Pigott. *Architectural Features.*—1, G. F. Clarkson, book prize; 2, R. A. Duckett; 3, L. K. Hett. *Professional Practice.*—1, G. F. Clarkson, book prize; 2, W. C. Rhodes; 3, A. R. Gunn.

NOTES AND COMMENTS.

ON Wednesday last the Royal Institute at a special general meeting confirmed the resolution empowering the Council to acquire the interest in the galleries at the rear of its present premises, an important step that will be beneficial undoubtedly to the work of the Institute and the comfort of its members. These premises are not ideal, but it is worth while sacrificing some of the ideal for the advantage of remaining at 9 Conduit Street, and the difficulties of finding better premises or the opportunity of erecting better premises anywhere near the present centre are inconceivable to anyone who has not had experience in trying to solve the problem.

ON the same evening the Royal Institute completed its task of revising the bye-laws to suit the new Charter and the new conditions. The poll, as was to be expected on the point of limiting the period of service of ordinary members of the Council, confirmed the resolution of the meeting of June 11. The remaining bye-laws, referred back to the Council, were passed after some discussion practically as printed, the only important amendment being that the period within which, after a resolution has been carried at a special general meeting, a poll can be demanded has been extended from seven to fourteen days, with the avowed object of allowing provincial mem-

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bers of the Royal Institute to demand a poll, if they should so desire. It says much for the willingness and desire of London members that provincial members should not be debarred more than is inevitable from the affairs of the Institute that such a resolution should have been unanimously carried in a meeting of London members. In truth, the Londoners would like the provincials to be enabled as far as possible to take not only an interest but a share in the decisions of the Royal Institute.

THE Forms of Declaration were fully discussed, and some of the practical difficulties in the alterations proposed by the Council with the very laudable intention of setting a higher standard of professional ethics were so strongly appreciated that by a succession of whittling amendments the declarations now remain practically as they were before the new Charter. Nothing therefore now remains but the formal confirmation of the bye-laws as passed and their approval by the Privy Council for the new Charter and bye-laws to come into operation.

THE proposed St. Paul's Bridge has met with too great an opposition for the present in the Court of Common Council, and the recommendation of the Bridge House Estates Committee has, by a small majority, been referred back for reconsideration. We cannot see that the opponents of the new bridge have any very strong arguments on their side, their main contention being that the City ought to wait to see what will be the effect of widening Blackfriars Bridge and should improve the gradients and approaches to Southwark Bridge. But the widening of Blackfriars will only suffice to enable it to carry the tramway lines, and we know from the position of our office that there is often far more traffic trying to get to Blackfriars Bridge than it can conveniently carry. It seems to us, too, that an improvement in Southwark Bridge, if effectual in attracting traffic, will only bring that traffic into contact with the east and west stream, augment these, and congest still more than at present the western part of Cannon Street.

THE opposition to the proposed removal of Sir ROBERT GEFFERY'S almshouses in Shoreditch has little ground of support from any architectural interest in the old buildings, but as a matter of preserving an open area of about an acre in a crowded district there is much to be said in favour of the retention of the present establishment.

THE HITTITES.*

AT the outset of his first lecture Professor Garstang asked for that indulgence which he felt would be readily accorded to the treatment of a new science dealing with an unknown people using an unknown script and language. The subject, however, was not altogether new, so that a lengthy introduction was unnecessary; but inasmuch as it seemed to be ten years ago since the problem of the Hittites was last dealt with before the Royal Institution by Dr. Wright, the lecturer briefly reviewed the circumstances under which that problem arose, as a preparation for what was to follow.

There were four sources of evidence:—(1) The monuments and archives of the Pharaohs recounting their warfare with the Kheta and their allies in the North of Syria; (2) the references to the Hittites in the Old Testament, vague at all times, particularly in the Book of Genesis, but more readily intelligible after the settlement of the Israelites in Canaan; (3) the later records of Assyria, giving glimpses of the final overthrow of the Hatti; and (4) a series of prehistoric and unexplained monuments associated with peculiar hieroglyphic inscriptions in the North of Syria. It was in pondering upon these materials that Professor Sayce came to the natural conclusion that the unexplained monuments in question must be those of the Hittites, and finding the same hieroglyphs even in the west of Asia Minor, was led, in 1876, to his dramatic inference of a forgotten empire, an Oriental Power rivalling those of Egypt and Assyria. It was a brilliant hypothesis, imaginative and scholarly, smiled upon indulgently by the age of over-cautious and easier destructive criticism that is happily passing by, but confirmed none the less thirty years afterwards—that is, two years ago—in its main features by the discovery of Hittite archives at Boghaz Keui, in the north centre of Asia Minor, archives including diplomatic correspondence with the Courts of Babylon and of Thebes. The discoveries of Layard and Schliemann, Mariette and even of Champollion have not had effects more reaching than will these.

As Professor Sayce has published the results of his reasonings, and the main features of the problem are well known, the lecturer selected for illustration from this preliminary material only some few details of history and archæology of special interest in the course of his inquiry.

Historically, the first reference to the Kheta in the eighteenth dynasty is in the twenty-third year of Thothmes III., B.C. 1474, when they are referred to as the great Kheta, or Kheta the great, possibly as being chief among the Hittite peoples. They were then seated in the North of Syria; but looking back, there are earlier traces of the gathering and oncoming of the various tribes in the North of Syria, who later together formed the Hittite confederacy, under the leadership of the Kheta chieftain. (It is in this sense, by the way, that we use the word Hittite.) Thus in his twenty-third year the same king, addressing his army before Megiddo, says:—"That (vile) enemy of Kadesh has come and entered Megiddo, having associated with himself other chiefs of all the lands previously obedient to Egypt as far as Naharina."

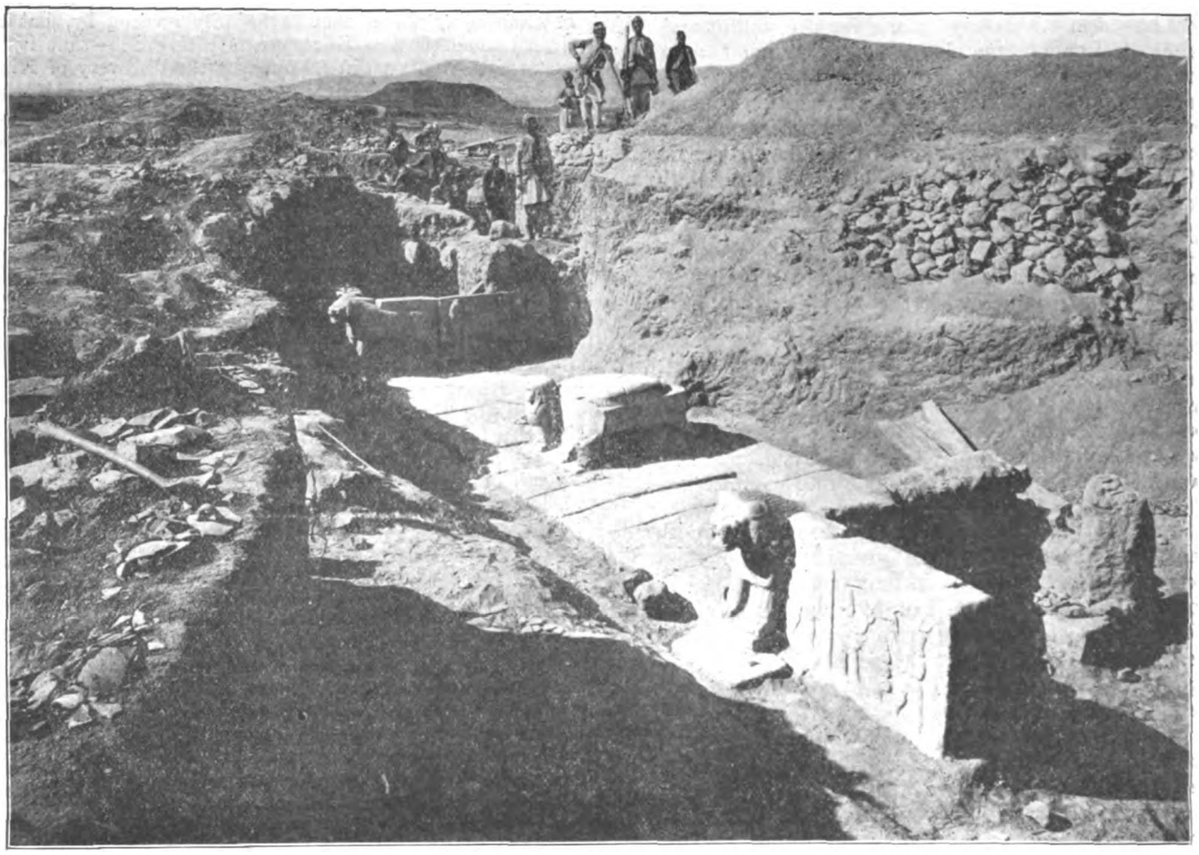
The last-named country, seemingly somewhere on the plains between Aleppo or Aintabb and the Euphrates, is mentioned several times previously, even as far back as the reign of Thothmes, about B.C. 1550; for in the biography of Aahmes at El Kab there is an account of an expedition to repress a rising there, when the narrative says, "We found that enemy who had plotted conspiracy." So that the land had been conquered earlier, though no Egyptian record of the fact has come down to us.

Whoever "that enemy" may have been, the Hittite presence is felt, even upon the frontiers of Egypt, at a much earlier date—namely, in the twelfth dynasty. The reading Kheta on Stela C 1 in the Louvre has not been explained away, in spite of the wrigglings of philologists. And the strangers immigrant into Egypt depicted on the tomb walls at Beni Hassan are witness to the presence in southern Syria of a culture influence which has one peculiarity in common with that which typifies the Hittites—*e.g.*, the turning-up shoe and several features nearly related, as the embroideries and the lyre. This presence of an early branch, settled already in southern Syria, would explain many of the difficulties of the references in the Book of Genesis. This would fully accord with a fact of Babylonian history recently brought to light by Mr. King, that a Hittite invasion preceded the overthrow of the dynasty of Khammurabi. However that may be, from the time of Thothmes III. onwards the ever-renewed struggles of the Pharaohs with the Hittites are matter of common history. In the time of Amenhotep III., Egypt made an alliance with the Mitani (east of the Euphrates), who report in one of the Tell El Amarna letters a struggle with the Khatti. This struggle was destined to continue, but from one of the recently discovered tablets of Boghaz Keui it appears that it was not until 100 years later that the Mitani country was absorbed into the Hittite power. Further letters in the following reign, that of Khuenaten, indicate the leaguing together of the principalities of Syria with the Kheta, who from the north of Syria had gradually spread their influence south until, in 1375, they were finally established in Kadesh, in the northern Lebanon; indeed, a Kheta leader addresses thence a letter in a foreign language to Egypt about that time.

The monuments of Seti and Rameses the Great take up the story. The offensive and defensive alliance of about B.C. 1300 did not altogether end the struggle, for Rameses III. claims to have made a living chief of the Kheta captive; but the circumstances of these later wars are different. It is suggested, indeed, by the name of the mother of Psamtek III. in much later times, viz., Ti-ent-Kheta, that there may have been colonies of the Kheta in Egypt for several centuries. With regard to the treaty of peace, the lecturer referred to one of the seals, which is described as the image of Sutekh embracing the great chief of the Kheta. This recalls, as the late Italian scholar De Cara pointed out, one of the sculptures of Boghaz Keui. These sculptures he proposed to consider further in the light of recent discoveries, but the suggestion at the time was far-seeing and noteworthy. It is also remarkable that the other seal is described as representing the image of Sutekh embracing

* Abstract of a short course of lectures delivered at the Royal Institution by Professor John Garstang, B.Litt., M.A., F.S.A., John Rankin Professor of Archæology, University of Liverpool.

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GENERAL VIEW.—BASE OF SCULPTURED PORTICO OF HITTITE PALACE AT SAKJE-GEUZI, DATE ABOUT 850 B.C.

the great Queen of the Kheta, who was priestess of the god. From other monuments of Rameses II. much is gleaned as to the racial types of the Hittite confederates, their arms and chariots and their fortresses. The frontier stronghold of Kadesh is several times represented, showing the extra mural towers which were used for purposes of defence, giving an enfilading fire against attack. This type was a definite stage more advanced than the Egyptian fortresses that are known, and it is interesting to compare these pictures with plans of Hittite fortresses to be considered later.

Other temple sculptures (or mural decorations) show the Hittite captives and warriors, in which many types may be made out, while several are conspicuous. These types were compared by the lecturer with the modern people of Hamath, Kyzyl Hissar, Eyuk, Kartal. Egyptian evidence of confederacy was confirmed by the Biblical references in the later books. Thus, "All the kings of the Hittites" (I. Kings). Earlier reference (Genesis) places Hittites in South of Palestine around Hebron; intermarriage was frequent; they were settled. "Thy father was an Amorite, thy mother a Hittite," of Jerusalem (Ezekiel xvi. 3, 45), is now full of a new ethnographical importance. This may well have been an earlier settling of Kheta or some branch of the Hittite people, coming by way of the mountain ranges fringing the seaboard of Syria, where the types mostly survive.

Assyrian monuments do not refer to the Hatti until 1100 B.C., but the Hittite archives make mention of Assyria 200 years earlier. At that time (Tiglath Pileser III.), the Hittites appear to be seated in strength on the Orontes, and Carchemish was one of their cities. Sargon (721-4 B.C.) finally overcame the Hatti.

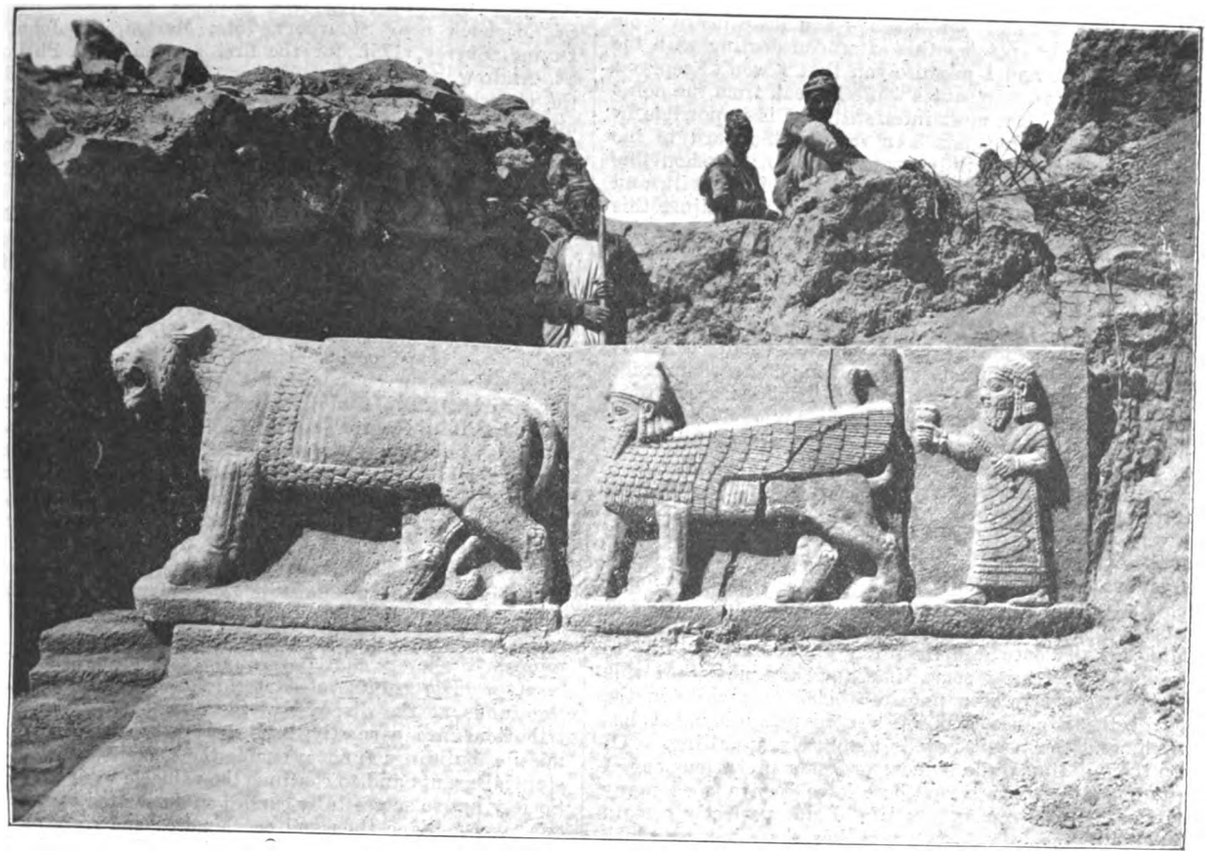
Time did not allow the lecturer to develop the question of religious symbolism, which a comparison of the more striking sculptures with one another invites, especially viewed by the light of references direct and indirect in Strabo, Herodotus, and even Homer and Lucian; and in his second lecture Professor Garstang referred those interested in this point to the recent discussions of Ramsay (Luke, the Physician), Frazer (Adonis, Attis and Osiris), and Sayce (Transactions of the Society of Biblical Archæology), and passed on to a consideration of those recent discoveries that have placed the study of the Hittite problem upon a scientific basis. The connected ruins of Boghaz Keui, Jasily Kaya, Eyuk, Sinjerli and Sakje-Geuzi give a more coherent impression, and a description of their monuments will shortly be collected by Professor Garstang into an illustrated volume "The Land of the Hittites."

The lecturer proceeded to describe these settlements in order, commencing with Boghaz Keui and Jasily Kaya, which mark the site of the northern capital of the Hittite confederacy as opposed to other southern sites that were presumably also capitals, like Marash and Carchemish. We apprehend that Professor Garstang's view is that just as Athens and Sparta were capitals of constituent states of the Greek confederacy, so these northern and southern settlements were capitals of a Hittite confederacy.

The lecturer described the features of Boghaz Keui as comprising an acropolis with a series of buildings commencing with an early palace or temple of about B.C. 1300, having a courtyard and chambers, but no sculptures; then main fortifications erected probably between B.C. 1300 and 1200 of great blocks of stone without mortar. These were succeeded by a rebuilding of the palace between B.C. 1100 and 1000, a difference of its axial direction giving about 230 years interval from the earlier structure according to Sir Norman Lockyer's calculations. Between B.C. 900 and 800 sculptures of bold and decorative character were introduced in the flanking masonry of the gates with symbolical lions. Then about B.C. 570 the city fell during the invasion of the Lydian Crœsus.

Coming to Jasily Kaya, the lecturer described the relation of the great chamber and small gallery of this sanctuary in the rocks, with the arrangement of sculptures in the former representing two processions meeting and a central group of the divine triad, Khattu, Cybele and Attis, as to which the lecturer referred to the various theories advanced by Frazer, Ramsay and others. He pointed out that the minor deities, Asiatic and local, had been overlooked by scholars. New points made out by Professor Sayce are that the divinity of Kas follows Khattu, and that amongst the females represented the goddess of Comana appears. The costume of the priest-king and the absence of any other representation of the king pointed to the rule of a hieratical monarch, and agreed with the reference by Strabo to a priestly dynasty, in connection with which the lecturer discussed the theory of an eunuch priest. The little gallery Professor Garstang ascribed to the Holy of Holies, with its winged monsters guarding the entrance. The lion figure he described as the central cult object with its dagger emblem

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DETAIL OF SCULPTURES.—HITTITE PALACE AT SAKJE-GEUZI.

and lions. The figures of Sutekh and Khetasar, the god and king embracing, was compared with the representation on the seal of the Hittite treaty with Rameses the Great, and in connection therewith the lecturer discussed Frazer's theory of the god leading and encouraging the king's representative to self-sacrifice. The facial types of the warriors on the sculptures were considered with regard to Ramsay's theory that these were Amazons simulating men, and Myres's theory that they were a beardless race mistaken for women by the ancients.

Eyuk said the lecturer was an example of a walled town and palace, such sites although rare in Asia Minor being plentiful in northern Syria. The sphinx gate here was the entrance to a palatial building, the facial type of the sphinx being analogous to that of the statue of Nefret, queen of Egypt in the twelfth dynasty. As at Jasily Kaya, so at Eyuk, there was exhibited a double eagle, as the probable emblem of Eyuk in both cases. A bull shrine and other cults were also indicated, in which probably the figures of musicians and a ladder scene bore a part. Reference was made by the lecturer to Macridy's recent excavations showing an earlier building, also with sculptures, including a wild boar hunt and stag hunt.

At Sinjerli as at Boghaz Keui, there was an earlier and a later building period, the former of which commenced about B.C. 1300, when the site of the future citadel was marked out by houses closely packed together, culminating about B.C. 1100, in the time of Tiglath Pileser I., in a city of 100 towers. From B.C. 900 to 745, the date of Tiglath Pileser III., the citadel rose in importance and experienced its period of splendour, when the palace was erected, adorned with sculptures, that formed the residence of the prince of Shamal. About B.C. 680 came the ruin of Sinjerli at the hands of Asarhaddon, the conqueror of Egypt, who numbered amongst his prisoners Pharaoh and the King of Tyre. Sinjerli was soon after rebuilt by a vassal of Asarhaddon.

Professor Garstang then described the interesting discoveries made by him last year at Sakje-Geuzi, particularly at the mound known as Jobba-Eyuk, the ruins of Kurdish and Roman buildings superposed over the Hittite stratum, and then the wonderful remains of the portico to a Hittite temple or palace, or possibly palace-temple. This portico consists of wing walls at either side, with a central structure. The wing walls have short returns at each end, and at the angles sculptured lions. On the walls themselves are figures of sphinxes, eagle-headed deities, the priest-king, the whisk-bearer, the royal falconer, and a scene showing two personages fertilising the sacred tree. The central structure has figures of sphinxes supporting a circular carved base, which may have been an altar or the pedestal of a statue, but more probably in Professor Garstang's opinion it was the base of a pillar helping to support the entrance. By the courtesy of Professor Garstang we illustrate some of the details of this portico, which it will be seen differ from, though generally resembling, Assyrian sculpture. In Professor Sayce's opinion these sculptures are the work of the Hittites of northern Syria, dating between the campaigns of Assur-nazir-pal in B.C. 880 and the conquests of Tiglath Pileser III. about 730 B.C. Continuing, the lecturer described the relation of these Hittite remains to the lower culture-strata in the mound, marked by distinctive character of painted pottery and overlying other strata of neolithic settlements.

In conclusion, Professor Garstang summarised what is at present known about the Hittites; that the fact recently established by Mr. King that Hatti invaded Babylonia during the Khammurabi dynasty about B.C. 2000 is confirmatory of the earliest traces of the people on the twelfth dynasty stela in the Louvre, the representation of them as immigrants at Beni Hassan, and the references in the book of Genesis, from which we infer that an early branch of the Hittites was already settled on the frontiers of Egypt in South Palestine. Then comes the first historical reference in the biography of Aahmes in the reign of Thothmes I. (B.C. 1550), and a definite mention of "great Kheta" in B.C. 1474. The Hittites repeatedly occur in Egyptian records till the time of Rameses III., after which the story is taken up by the Old Testament and Assyrian records. Later the Hatti appear about B.C. 1100 in the time of Tiglath Pileser I. and Sargon finally overcame them, B.C. 721. The land they occupied was the Taurus region, with extensions to northern Syria and the plateau of Asia Minor. The race was very mixed and they seem to have mingled freely with pre-existing local tribes, which may account for the clear Mongolian and Semitic elements. They were organised as a confederacy of the states under the Kheta chieftain, who appears to have come from the Taurus region, and whose capital in B.C. 1300 was at Boghaz Keui.

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THE BUDGET AND THE BUILDING TRADE.*

MY Lord, Ladies and Gentlemen,—You have heard some very brilliant speeches this afternoon dealing with the Budget generally, and I promise you that I won't keep you more than two or three minutes while I speak from the point of view in which I am most interested. It is impossible in my case, after all that has been said with regard to the unemployment in the building trade, not to talk shop this afternoon. I want you to remember if you kindly will, and bear it in mind wherever you go in agitating against this Budget, that the building trade is by far the largest individual trade that exists in this country. You see that it obtains everywhere. Of course the workers in the building trade are in a large minority in the cotton districts, coal districts, mining districts, or in special towns, but as every town, small or large, has its one, two, three, twenty or thirty builders, the aggregate number of working-men in our trade is by far greater than in any other. That being so, it is obvious that anything that promotes unemployment, and it is that which I am entirely going to speak about this afternoon, affects very seriously the building trade.

Now, the effects of the threats of Mr. Lloyd George, the Chancellor of the Exchequer, on more than a few trades were very serious, and they at once had an enormous effect upon the building trade. People were alarmed, and I could give you no end of instances, not only of work abandoned which had practically been started, but I could give you instances without end of people who were contemplating building, who at once said that they would have nothing to do with it. That was some time ago, and now that this Budget has actually been put into black and white in the shape of the Finance Bill, still more unemployment has occurred, and the result now is absolutely appalling. Of course the building trade is more or less a precarious one, I admit, and at certain times there have been a good many unemployed, but never in my life, I am perfectly certain that never in the last thirty years, has there been so much unemployment of good men. Splendid bricklayers, splendid joiners, men that I should be only too glad to employ, I might say friends of mine, are walking the streets in order to find a job. This is a most serious matter. We all know that there must be a certain margin of unemployment, and that the weak and idle men drift away and cause chronic unemployment, but at this moment there are splendid, industrious, honest men unemployed in huge numbers, and how they stand it is really wonderful. I believe that they are beginning to see the cause, and what I want to impress upon every gentleman in this room is as he goes about the country in season and out of season, to try and convince the working man, and never stop pointing out to him, this particular effect upon his prospects caused by the Budget.

I believe that if the Government had come into power with a mandate—you know a mandate is a modern word, but a very popular one—to so frame their measures as to produce unemployment they could scarcely have done more than to propose this Budget. Of course, we builders we shall suffer individually no doubt, and all of you will suffer, but you are able to bear a certain amount of suffering and still have the wherewithal to live, but these men have not, and their suffering means want of bread and want of means. It is indeed a strange irony that this Government, who were always talking about improving the social conditions of the workers, should at once proceed to do their best to ruin them.

In view of the speakers who are to follow, and the interesting information you will get from them and the late hour of the evening, I will simply say again that I hope you will keep pegging away day and night, to try and do your best to upset this Budget by all means in your power.

* Report of speech by Mr. John Howard Colls, Past President of the Institute of Builders and of the Master Builders' Association, delivered at the Queen's Hall, Langham Place, W., on July 13.

INCORPORATED SOCIETY FOR PROMOTING THE ENLARGEMENT, BUILDING AND REPAIRING OF CHURCHES AND CHAPELS.

THIS Society held its usual monthly meeting on Thursday, July 15, at the Society's House, 7 Dean's Yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. There were also present the Rev. H. B. Coward, the Rev. C. F. Nolloth, the Hon. E. P. Thesiger, C.B., Messrs. George Cowell, E. Lee-Warner, J. C. Powell, F. H. Rivington, Lewis Wigram and Joseph Monday (Secretary).

Grants of money were made in aid of the following objects, viz.:—Building new churches at Lower Mitton, St. Michael, near Stourport, 75*l.*; Merton, St. John the Divine, Surrey, 125*l.* for the first portion; and Purlwell, St. Andrew, near Batley, Yorks, 125*l.*; towards rebuilding the church at Haslington, St. Matthew, near Crewe, 50*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Boyne Hill, All Saints', near Maidenhead, 75*l.*; Cann, St. Rumbold, Dorset, 15*l.*; Fincham, St. Martin, Norfolk, 20*l.*; Hedworth, St. Nicholas, Durham, 35*l.*; Ipswich, St. Bartholomew, 20*l.*; Llanddewi, St. David, Denbigh, 10*l.*; Sefton, St. Helen, near Liverpool, 40*l.*; Skenfrith, St. Bridget, near Monmouth, 25*l.*; Trent Vale, St. John the Evangelist, Staffs., 50*l.*; Warmley, St. Barnabas, near Bristol, 20*l.*; and Whatcote, St. Peter, Warwickshire, 15*l.* Grants were also made from the Special Mission Buildings Fund towards building mission churches at Caergeiliog, near Holyhead, 15*l.*; Nedging Tye, Suffolk, 5*l.*; Scackleton, near York, 20*l.*; and Washford, near Taunton, 30*l.* The following grants were also paid for works completed:—Hill, St. James, near Sutton Coldfield, 75*l.*; Shuttington, St. Matthew, near Tamworth, 25*l.*; Eastney, St. Margaret, Hants, 200*l.*, on account of a grant of 1,000*l.*; Sunnyside, St. Michael, near Berkhamsted, 120*l.*; West Kirby, St. Andrew, Cheshire, 155*l.*; Epsom, St. Barnabas, Surrey, 120*l.*; Southover, Wells, Som., 25*l.*; Charterhouse-on-Mendip, Som., 20*l.*; Ebbw Vale, Mon., 10*l.*; and Methwold, Norfolk, 15*l.* In addition to this the sum of 206*l.* was paid towards the repairs of eleven churches from trust funds held by the Society. The grants voted at this meeting have exhausted the funds at the disposal of the committee. Liberal contributions are earnestly invited both to the general and mission buildings fund to enable the committee to vote substantial grants and to continue the valuable work which this Society has so successfully carried on during the past ninety-one years. Nine thousand one hundred and sixty places—*i.e.*, more than half the parishes in England and Wales—have been aided by the Society with grants from the general fund amounting to 1,062,765*l.*, and 973 grants have been made from the mission buildings fund amounting to 26,229*l.*

KEBLE COLLEGE, OXFORD.*

By D. J. MEDLEY, M.A.

(*Concluded from page* 23.)

VERY shortly after the presentation of the report of this committee JOHN KEBLE died (March 29, 1866), and those who were anxious to perpetuate his memory realised the peculiar fitness of associating the newly proposed College in Oxford with his name. One important modification took place in the scheme as proposed by Dr. SHIRLEY's committee. The College was not to be confined to "persons desirous of admission into the Christian ministry," but to be open to all members of the Church of England, whether preparing for ordination or not. A committee for raising a fund was formed, with Archbishop LONGLEY at its head. Rather more than 50,000*l.* was subscribed directly. A site of about four and a half acres was purchased from St. John's College. Mr. WILLIAM BUTTERFIELD was chosen as the architect, and on the anniversary of Mr. KEBLE's birth, April 25, 1868 (St. Mark's Day, as every Keble man knows) the foundation-stone was laid by Archbishop LONGLEY. A further step was taken when, largely through the instrumentality of Earl BEAUCHAMP, a staunch friend of the College to the end of his life, a Royal Charter of Incorporation was obtained, and Archbishop LONGLEY's successor, TAIT, accepted for himself and succeeding Archbishops the post of Visitor of the College. Opportunity was taken of the Commemoration of 1870 to open the College with ceremonies presided over by the Chancellor, the Marquis of SALISBURY, and in the following October undergraduates were admitted into residence. Finally, in April 1871, by degree of Convocation, the College was admitted to the privileges of the University. Great opposition was aroused by these various proceedings, and the legality of this last act was acrimoniously challenged.

* See Illustrations.

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The reason of the hostility was chiefly twofold—entrance to the College was to be restricted to members of the Church of England; and so apprehensive were the founders of the power of the secularising spirit, that there was reserved to the governing body the right, if they thought fit, of removing the College away from Oxford altogether. The government of the College was also a novelty. The charter had been granted to a Council representing the original subscribers, who elected the Warden of the College, who was also their president, and filled up vacancies in their own body by co-optation. This Council, consisting almost entirely of distinguished Churchmen, both clerical and lay, not necessarily residing in Oxford, has the entire management of the finances. Three Wardens have presided over the destinies of the College. The present Bishop of SOUTHWARK, whose nineteen years of rule fixed firmly the lines on which the new College has run to such unexpected success; the Rev. R. J. WILSON, Fellow of Merton and Warden of Radley; and the present holder of the office, the Rev. W. LOCK, since 1895 also Dean Ireland Professor of Exegesis, who has devoted his life to the destinies of the College, and is well known to the general public as the biographer of KEBLE and editor of the *Christian Year* and the *Lyra Innocentium*.

The buildings of the College have been gradually erected. With the first large sum at their disposal the committee of the Memorial Fund not only bought the site, which cost 7,000*l*., but also erected two blocks which form the east and west sides of the main quadrangle, with rooms for a hundred undergraduates and six tutors. In contrast to the stonework of the older Colleges the new College was built of variegated red and yellow brick with Bath stone dressings. A massive gateway on the east side opposite the University Park forms the entrance to two quadrangles flanking it on the north and south. Both quadrangles have been gradually all but surrounded by buildings. At first the hall and chapel were temporary structures, the friends of the College hoping that further gifts might enable them some day to erect public buildings worthy of the great College they had planned. Their hopes were fulfilled in a most unexpected manner. In the summer of 1872 Mr. WILLIAM GIBBS, of Tyntesfield, Somerset, who had given munificently and most unostentatiously to many objects connected with the Church of England, at the suggestion of Sir J. T. COLERIDGE offered the gift of a College chapel. The foundation-stone was laid by Mr. GIBBS himself on St. Mark's Day, 1873. In 1875 Mr. GIBBS died, and shortly after there came through Mr. HENRY HUCKS GIBBS (afterwards Lord ALDENHAM), a member of the Council of the College, the offer of a companion building to the chapel, which should fill in the south side of the great quadrangle and should contain both hall and library. It subsequently transpired that the donors were the two sons of Mr. WILLIAM GIBBS, who desired thus to honour their father's memory by completing his work. Again on St. Mark's Day, 1876, a great company assembled, and the same day witnessed the opening of the chapel by the Visitor of the College and the laying of the foundation-stone of the hall and library by the Chancellor of the University.

The College buildings now consist of two quadrangles. Of these the larger, lying to the right of the gateway, is second in size only to Tom Quad at Christ Church. A broad gravelled terrace runs round a sunk grass plot, across which run narrower gravelled paths. East and west lie two large blocks of undergraduates' and tutors' rooms. On the north stand the chapel and a small block of rooms. The southern side is occupied by a building which contains the hall and library above, lying respectively right and left of the staircase, while the space below is divided up into a senior and junior common-room, a lecture-room, and good kitchen offices. Behind the western block of living rooms there is a garden which is the only free space remaining to the College.

The smaller quadrangle lies to the left of the main gateway. The east side is occupied by a large block of rooms, terminating, after a short interval, in the Warden's lodgings. On the west side are a smaller block of living rooms and offices for the servants, many of whom live in the College. Thus room is found in the buildings for 155 undergraduates, and at first no one *in statu pupillari* was allowed to live outside. But the pressure on space was considerable, and ultimately the rule of residence within walls was so far relaxed that senior men were able within limits to obtain leave to spend their last year in lodgings. This increased the numbers of the College, which is now the third largest in the University.

So far as the buildings go interest centres naturally in the chapel, the hall, and the library. The chapel is approached through a western door by a short cloister, which connects it to the small northern block of living rooms, and also gives an exit into the quadrangle. It towers above the block to which it is attached, and is flanked on either side by large buttresses ending in a stone cornice and parapet surmounted by a stone pinnacle. The wall is divided horizontally into three spaces, the lower one arcaded in stone, the second relieved by surface pattern work, while the uppermost is pierced by spacious and lofty windows. The height of the outside wall is 90 feet to the ridge of the roof, while the window sills are raised 40 feet from the ground for purposes of internal decoration. On the south, the quadrangle, side the face of the huge mass is broken by a wide south transept and by a handsome entrance porch in the westernmost bay, which is carried up the full height of the building. Within the arch of the porch stands the *Agnus Dei;* above it, treated as a finial and also carved in stone, is a pelican feeding its young, a symbol of the sacramental union of CHRIST with His people, while the full gable is finished by a colossal figure, nine feet high, of St. MICHAEL, with the dragon at his feet. Each of the buttresses contains a niche filled with a statue, those at the western end representing Old Testament and those at the eastern end New Testament saints. Below these at the eastern end are two larger niches with statues representing the Angel GABRIEL and the VIRGIN MARY in the scene of the Annunciation, while in smaller niches above them stand figures of the Apostles St. PETER and St. PAUL. Internally the length of the chapel is 124 feet by 35 feet in width. It is divided into six bays, the first three forming the nave, the fourth the choir and transepts, and the remaining two the sanctuary. The nave is filled with oak seats arranged to face eastwards and not running along the north and south sides. This latter, which is the usual form of seating in a College chapel, dates from a period when those who attended such a chapel were on the Foundation as life members of it. Few such members remain at any College, and none such were contemplated in the new arrangements. It therefore seemed suitable that the seating in the chapel should follow the plan observed in ordinary parish churches. In the choir bay, however, the seats run along the north and south sides, and on the south side there is a large transept originally built as an organ chamber. Subsequently the organ was raised, and below it the transept has been cleverly turned into a small side-chapel, where is hung one of the treasures of the College, Mr. HOLMAN HUNT'S picture *The Light of the World*. This was the gift of Mrs. COMBE, widow of Mr. T. COMBE, of the Clarendon Press, an early friend and patron of some of the chief members of what is known as the pre-Raphaelite school of English artists. The decoration of the walls is elaborate and on a carefully thought out scheme. The lowest of the three horizontal spaces already mentioned is occupied by a stone arcading. In the second tier are ranged subjects and figures in mosaic framed in stone panels, and the third tier carries the windows filled with painted glass in what modern taste is inclined to criticise as crude and striking colours. The glass and the mosaics taken together are an attempt to illustrate within the available space, and "in some sort after the manner of the *Christian Year*," the dealings of GOD with the Church in patriarchal, Jewish, and Christian times successively. By juxtaposition of type and antitype the relationship is brought out between the Old and the New Testament. The subjects of the panels are sufficiently obvious to any

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spectator, the western half of the chapel being occupied with subjects from the Old Testament, the easternmost with subjects from the New Testament. At the east end, to which the whole scheme leads up, the window contains the scene of the Ascension, while below is placed a mosaic quatrefoil representing Our LORD as depicted by St. JOHN in the Revelation, with the seven candlesticks around Him and the seven stars in His right hand. Below again stands the reredos of various stones and marbles, in the centre a large Latin cross of white marble, on either side in mosaic the four living creatures of the Apocalypse. The whole reredos is surmounted by four angelic figures carrying musical instruments.

The hall and library do not, of course, need so much description. The hall is about the same length and breadth as the chapel, and is therefore one of the largest in Oxford. It is panelled all round, the windows are traceried and filled in with glass bearing simple patterns, and on the north side is a projecting gallery. The most interesting features of most College halls are the portraits, and although the youth of Keble has caused her to produce few sons whose deeds yet deserve the perpetuation of their memories within her walls, the College rightly attempts to prevent future generations from forgetting the early founders and benefactors whose names are woven into the story of her origin and beginnings. The place of honour in the middle of the dais is given to a posthumous portrait of Mr. JOHN KEBLE, by GEORGE RICHMOND, a beautiful piece of painting. One of the most interesting to the majority of visitors will be the portrait, also by GEORGE RICHMOND, of Dr. LIDDON at about the age of forty. He was a member of the Council of the College, and took a warm interest in its fortunes. Most Keble men would regret that the first Warden to whom the College owes so much, and to whom many individual men owe more, should be perpetuated to future generations by the singularly unattractive portrait on the walls. The same might be said of the portrait of Dr. PUSEY, whose personal influence and munificence contributed perhaps more than that of any one other person to the foundation and first starting of the College. Some of the pictures, such as those of Archbishop LONGLEY and Canon SHIRLEY, represent active well-wishers of the College who did not live to see its opening. Earl BEAUCHAMP's powerful and ungrudging service gains an appropriate recognition. Mr. J. A. SHAW STEWART was Treasurer of the Memorial Fund and for a while Bursar of the College. Dr. ROBERT WILSON, Dr. LOCK, Mr. AUBREY MOORE, and Mr. WAKEMAN are names honoured by a much wider circle than that of Keble graduates. Mr. WILLIAM GIBBS's princely gift assures to his portrait an honoured place.

Opposite to the hall stands the library, also a fine room. In it is placed an interesting bust of Cardinal NEWMAN, by WOOLNER, the gift of Mrs. COMBE. There are also busts of KEBLE and PUSEY by GEORGE RICHMOND. The books from the library of Mr. KEBLE were enclosed within gates in the first left-hand bay in order to check the depredations of the autograph-hunter! In a glass case within the bay there are to be seen many manuscripts of Mr. KEBLE, including one of a large portion of the *Christian Year* and another of the *Lyra Innocentium*. Another interesting feature of the library is the bequest of Canon LIDDON, which is especially rich, among other things, in Dante literature.

So young a College cannot be expected to have great wealth of historical memorials; but in days to come the historian of the English Church in the nineteenth century will scarcely be able to pass by the valuable collection of materials which is being gradually accumulated by generous bequests within its walls.

Two Two-light Memorial Windows have recently been erected in the north aisle of Mamble Church, Worcester, the subjects being our Lord and the Baptist and the Good Shepherd and David singing the "Shepherd" Psalm. The windows were designed and executed by Mr. H. Gibbons Murray, of Britannia Studio, Caroline Street, London, S.W.

ILLUSTRATIONS.

INTERIOR OF CHURCH OF ST. AGNES, LIVERPOOL.

THIS church was one of the buildings that contributed to the high reputation of the late Mr. J. L. PEARSON, R.A., and was erected by Mr. H. DOUGLAS HORSFALL, of Liverpool, in memory of his father. The church was commenced in 1883, and was consecrated in January, 1885. The illustration here given is from an etching by Mr. W. V. COLLETT, an artist whose work has brought him of late years into some prominence. The interior of the church, unlike the exterior, is remarkable for its dignified richness of effect, and every detail bears the impress of a refined mind. Mr. COLLETT in his etching has most successfully brought out that religious atmosphere that seems to have been the architect's chief aim, and especially the subtle light effects. The seven sanctuary lamps suspended from the ceiling recall the churches of Italy. In the process of photo-lithography some of the beauty of the etching has unfortunately been lost, but our illustration clearly indicates the skill which Mr. COLLETT has brought to his work. The dimensions of the picture are 18 inches by 13 inches. The edition is limited to 325 proofs; of these 25 Remarque proofs, signed and numbered, are obtainable at 5*l.* 5*s.*, and 300 signed artist's proofs at 2*l.* 2*s.* each. They may be had from Mr. W. P. WETHERED, Mossley Hill, Liverpool, or from the artist himself, at Downs Park West, Bristol. Any profit derived from the sale is to be devoted to the church.

OXFORD COLLEGE SERIES, KEBLE.—INTERIOR OF CHAPEL.

THESE views of Keble College are in illustration of the article thereon, by Professor MEDLEY, completed this week.

PELHAM SCHOOL, WIMBLEDON.—PLANS—THE BOYS' ASSEMBLY HALL—CORRIDOR, GIRLS' SCHOOL—CLASS-ROOM, INFANTS' SCHOOL—HEAD-MISTRESS'S ROOM, GIRLS' SCHOOL—A COMMUNICATION DOOR—CLOAK-ROOM, BOYS' SCHOOL.

THESE schools were opened on the 14th inst. by the Right Hon. Lord ALVERSTONE, Lord Chief Justice of England. In our last issue illustrations were given of the north-east view, an entrance doorway and an entrance gateway. As was then stated, accommodation is provided for 1,000 pupils, the infants being on the ground floor, the girls on the first floor, and the boys on the second. It will be seen from the plans that the floors are similar in general arrangement. The assembly halls have panelling of wood, stained green up to 7 feet. Antique glazed tiles are used for dadoes in class-rooms and corridors. The architect is Mr. H. P. BURKE DOWNING, F.R.I.B.A., whose designs were selected after a limited competition.

Mr. Nathan Solomon Joseph, F.R.I.B.A., of Porchester Terrace, Hyde Park, W., the oldest member of the committee of the Jewish Board of Guardians and brother-in-law of the Chief Rabbi, who died on June 11, aged 74, left estate of the gross value of 52,848*l.* 13*s.* 11*d.* The testator amongst many other bequests left 25*l.* to the Architects' Benevolent Institution.

Official Statistics have been published regarding mines and quarries of the United Kingdom in 1908. At the quarries under the Quarries Act there were 85,475 persons employed, of whom 54,449 worked inside the actual pits or excavations, and 31,026 outside. Compared with 1907 there is a decrease of 1,445 among the inside workers and of 894 among the outside workers, making a total decrease of 2,339 in the number of persons employed at quarries. The total quantity of stone and other minerals obtained from the quarries was 44,732,016 tons, of which 4,801,561 tons were iron ore. Adding to the produce of mines and of quarries over 20 feet deep 789,181 tons obtained from shallow open workings, there was a total output of iron ore of 15,031,025 tons. At the quarries under the Quarries Act there were ninety fatal accidents, which resulted in ninety-two deaths. Compared with 1907, there is an increase of two in the number of accidents, and of three in the number of deaths.

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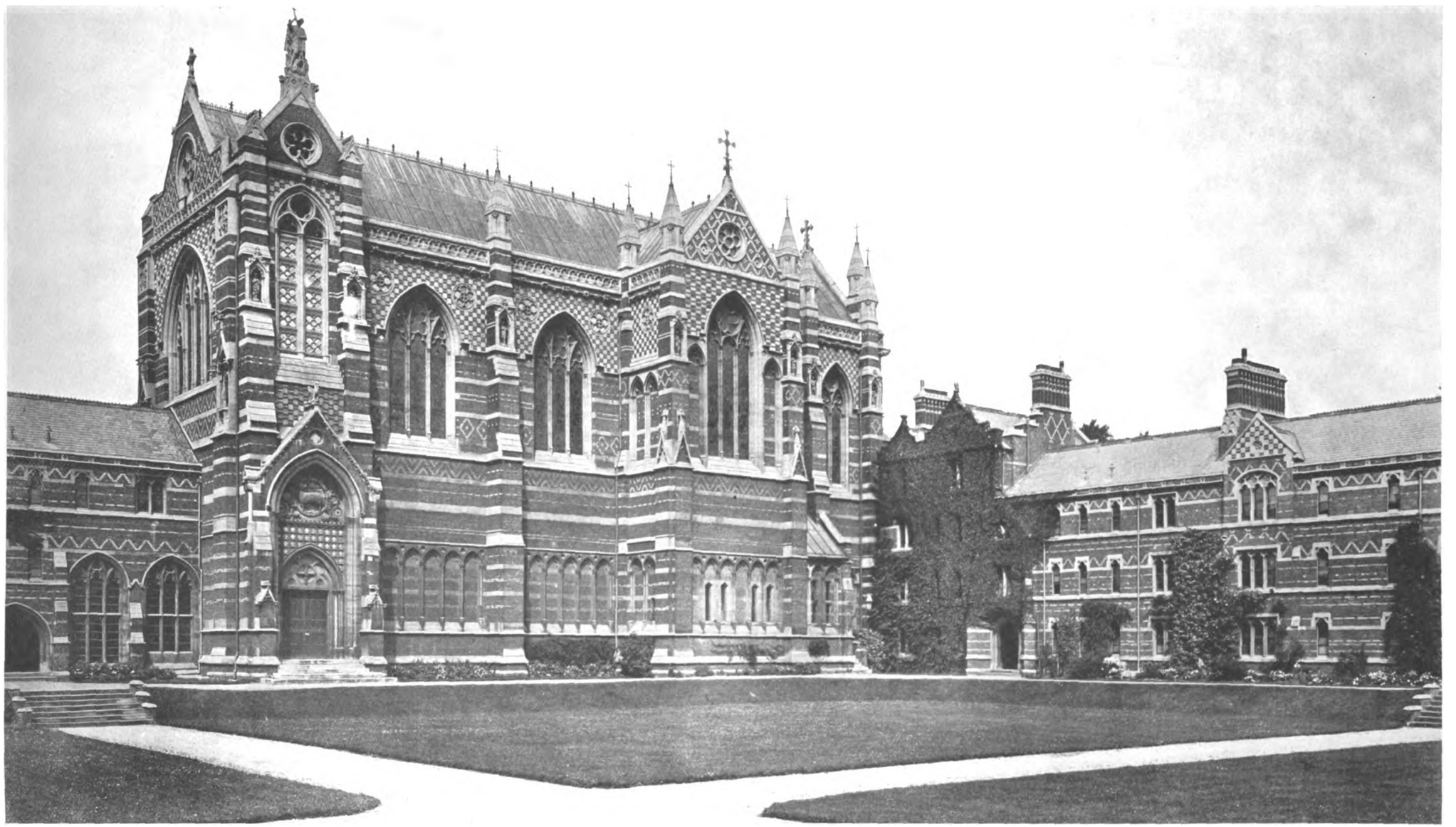


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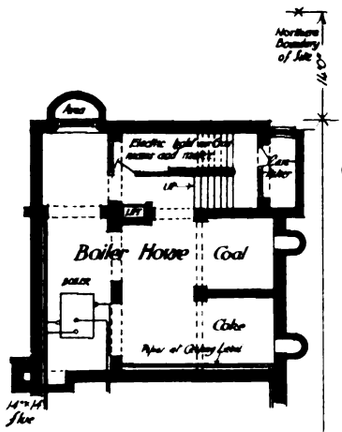
OXFORD COLLEGE SERIES. No. 51.—KEBLE.

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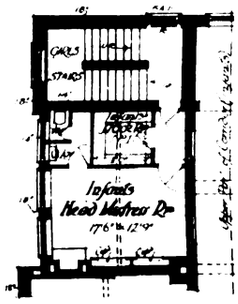
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Accommodation

Boys — 8 Class Rooms for [illegible] places each
Girls — 8 Class Rooms for [illegible] places each
Infants — 6 Class Rooms for [illegible] places each
1 Class Room for [illegible] places
2 Class Rooms for [illegible] places each

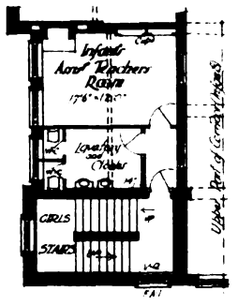


BASEMENT PLAN
Heating Chamber

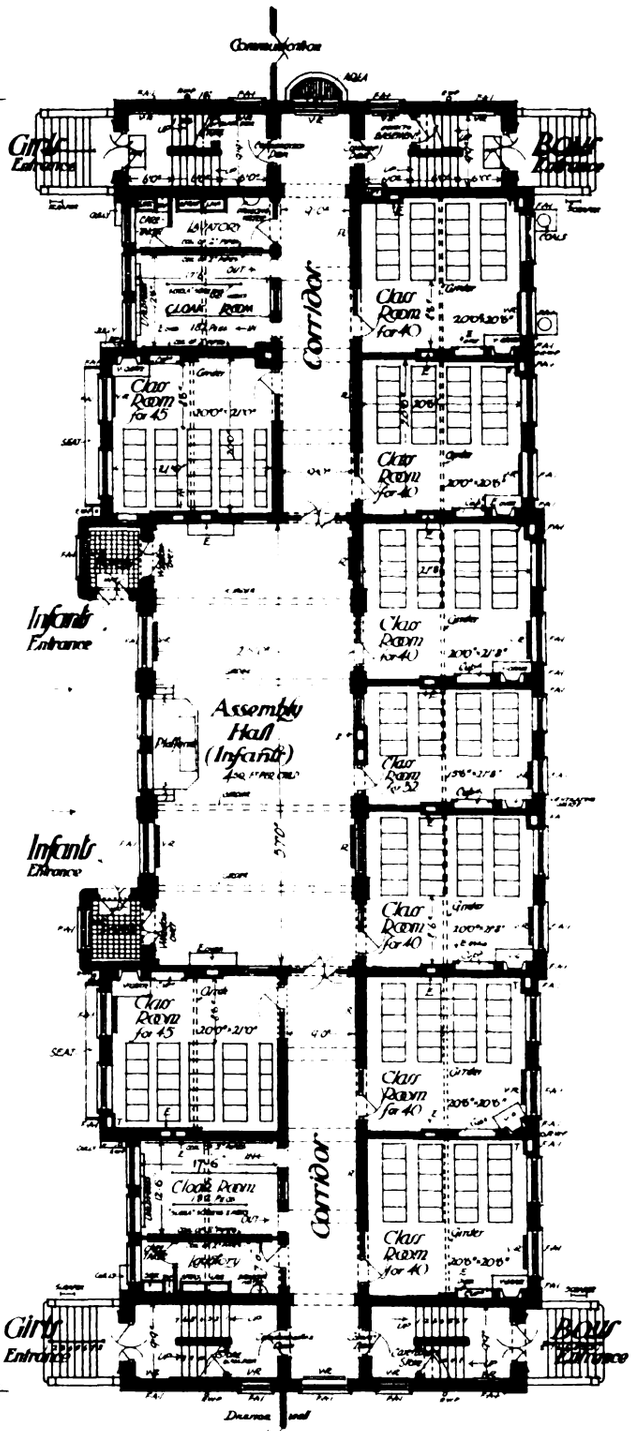


MEZZANINE FLOOR
over Infants' Cloak Room etc (North)

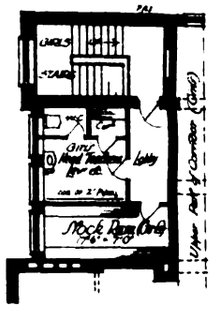
Additional Store Room for the Infants' Dept under the Girls staircase



MEZZANINE FLOOR
over Infants' Cloak Room etc (South)

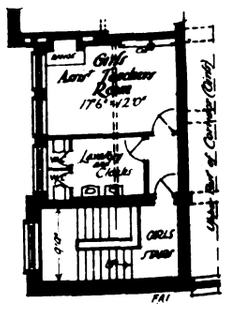


GROUND FLOOR PLAN
Infants



MEZZANINE PLAN
over Girls' Cloak Room (North)





MEZZANINE FLOOR
over Girls' Cloak Room etc (South)

Scale of 10 5 0 10 20 30 40 50 60 70 80 90

PELHAM SCHOOL
H P BURKE DOWNE

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Feb 1 July 23rd 1909.

Accommodation

— 8 Class Rooms	40	places each	——	320
— 8 Class Rooms	40	places each	——	320
— 6 Class Rooms	40	places each	240	
1 Class Room	32	places	32	
2 Class Rooms	45	places each	90	362
				1002

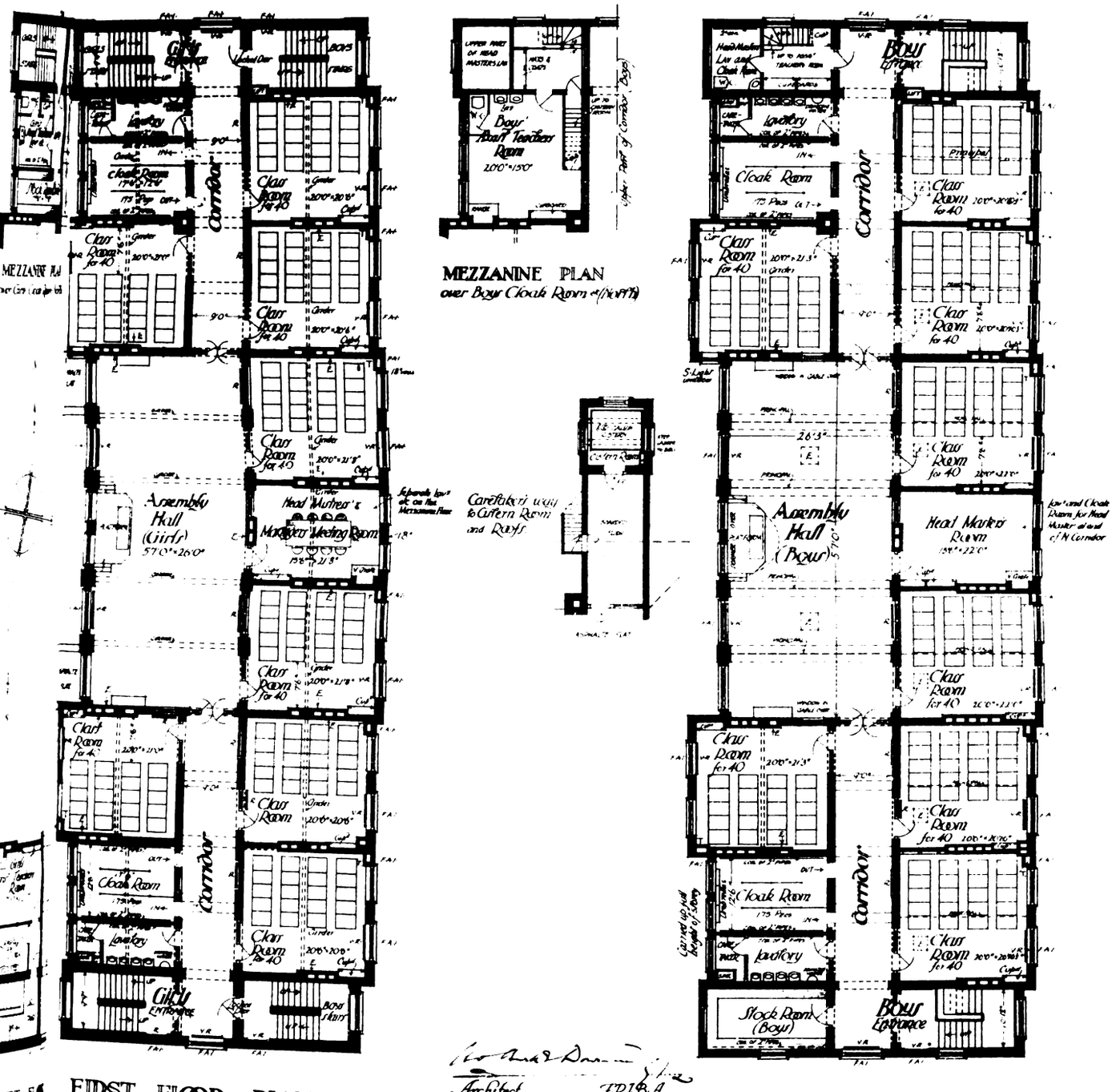


PHOTO-LITHO. SPRAGUE & C° L^TD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

PELHAM SCHOOL, WIMBLEDON.
BURKE DING, F.R.I.B.A., Architect.

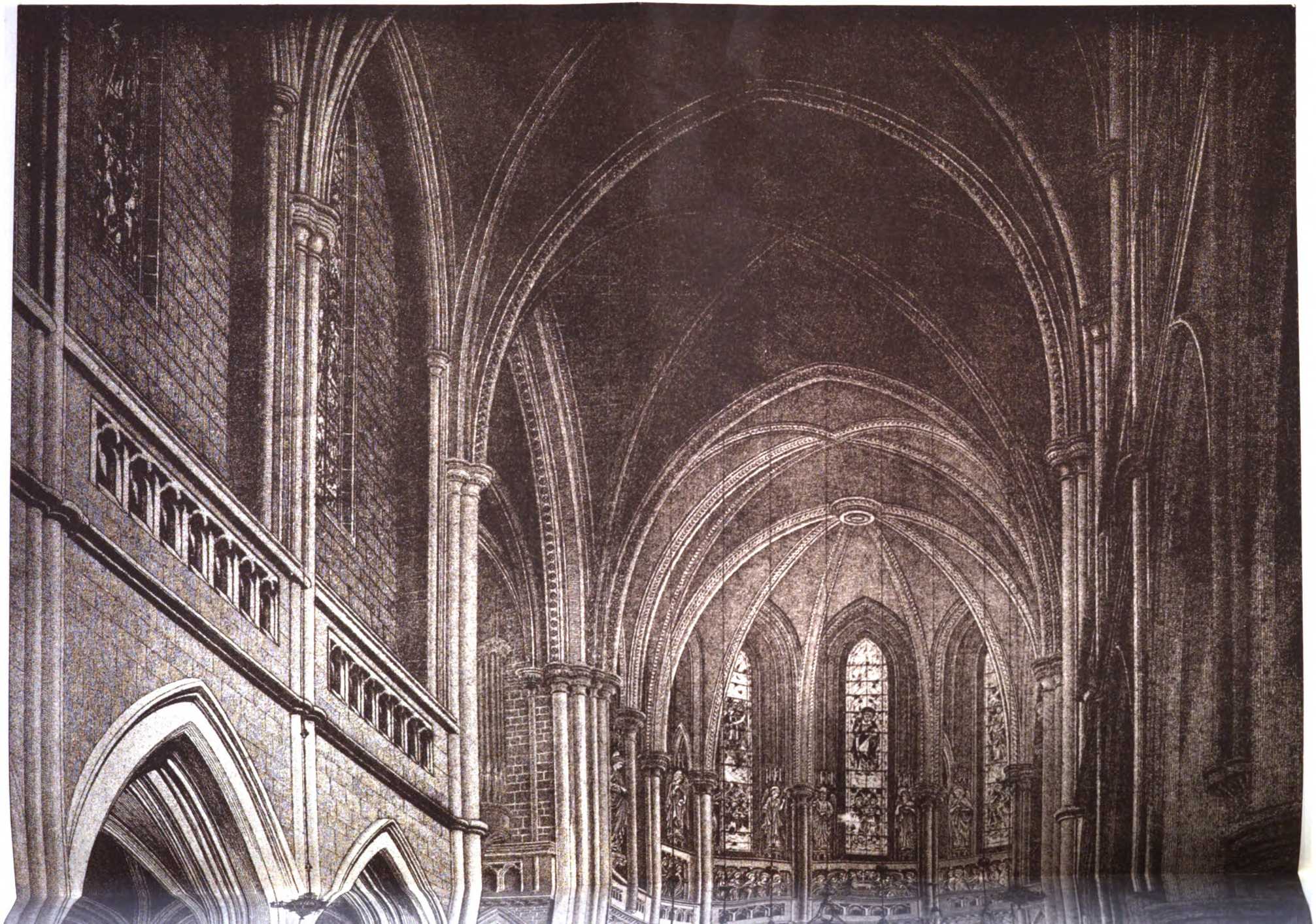
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INTERIOR OF CHURCH OF ST. AGNES, LIVERPOOL.

The late J. L. PEARSON. R.A., Architect.

(From an Etching by W. V. Collett.)

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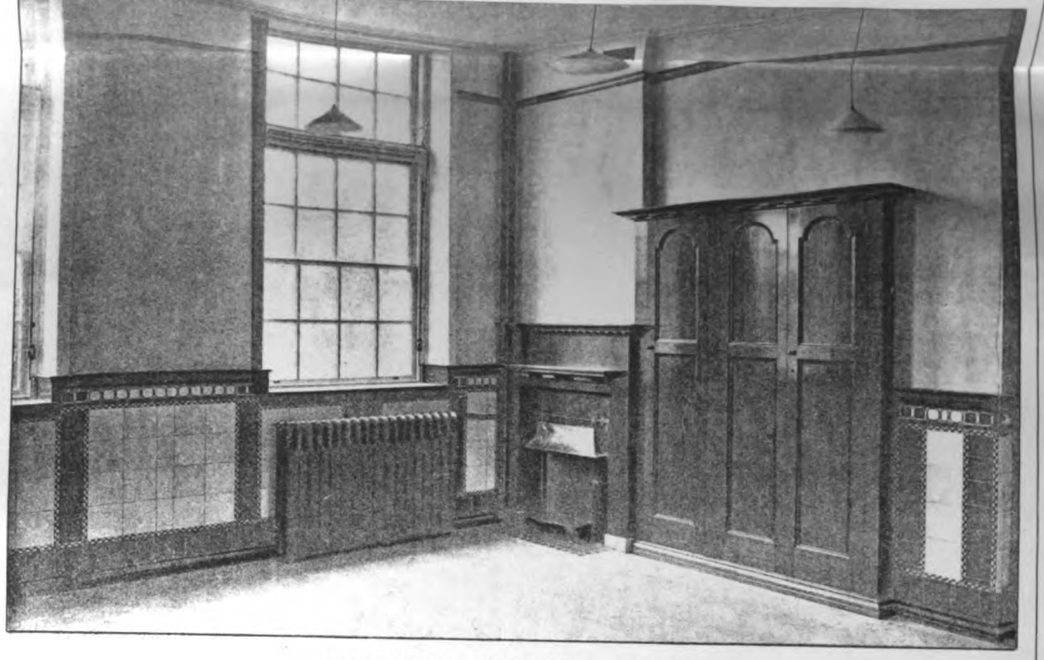
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THE BOYS ASSEMBLY HALL.

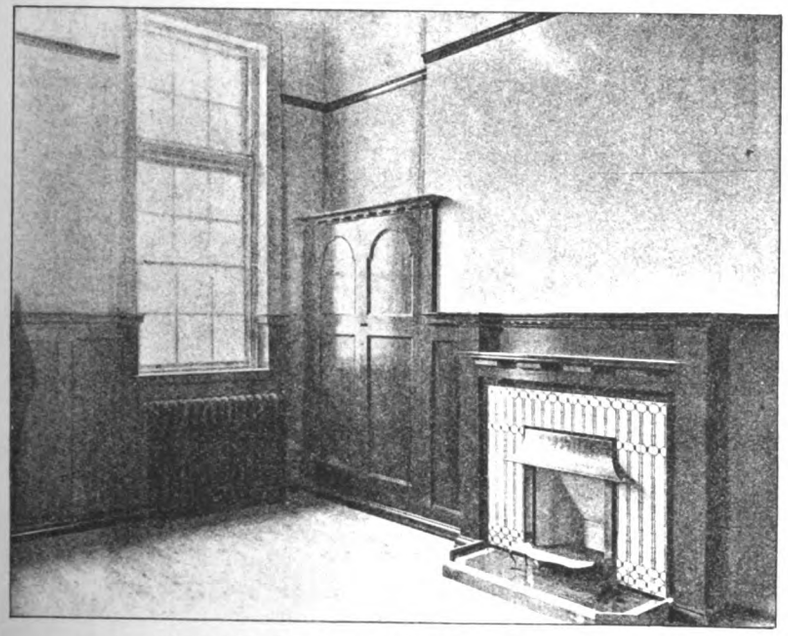
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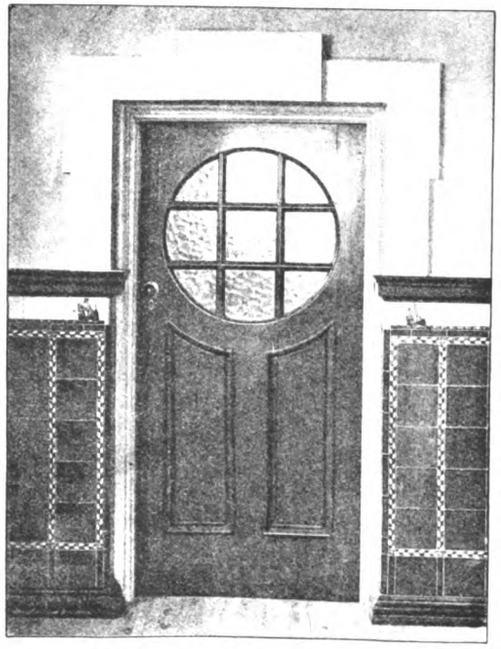
CORRIDOR: GIRLS' SCHOOL.



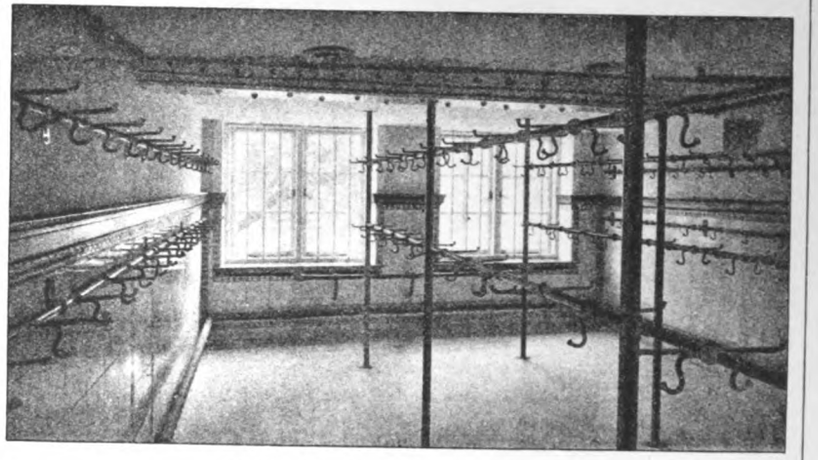
CLASS-ROOM: INFANTS' SCHOOL.



HEAD-MISTRESS' ROOM: GIRLS' SCHOOL.



A COMMUNICATION DOOR.



CLOAK-ROOM: BOYS' SCHOOL.

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PELHAM SCHOOL, WIMBLEDON.

H. P. BURKE DOWNING, F.R.I.B.A., Architect.

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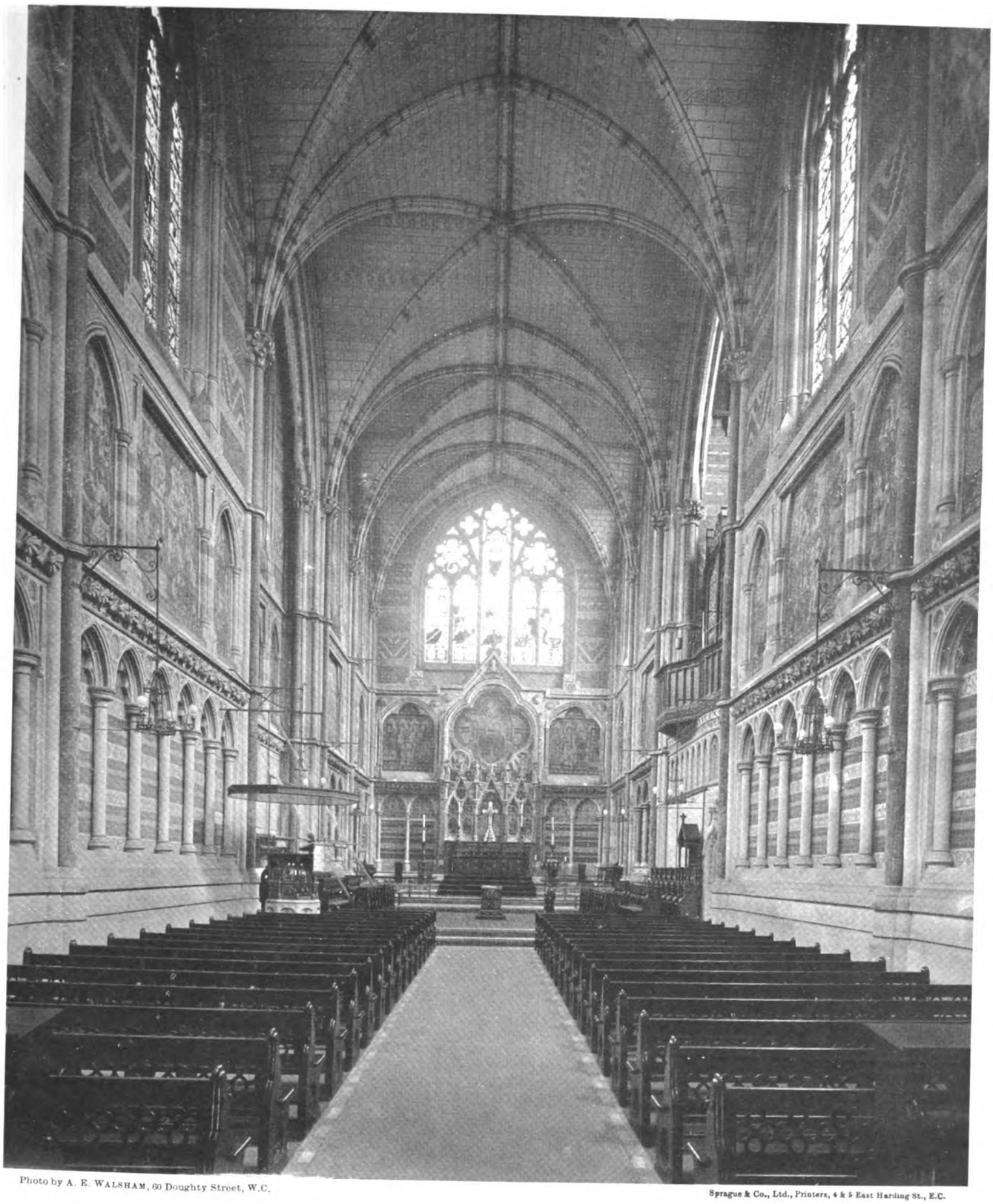


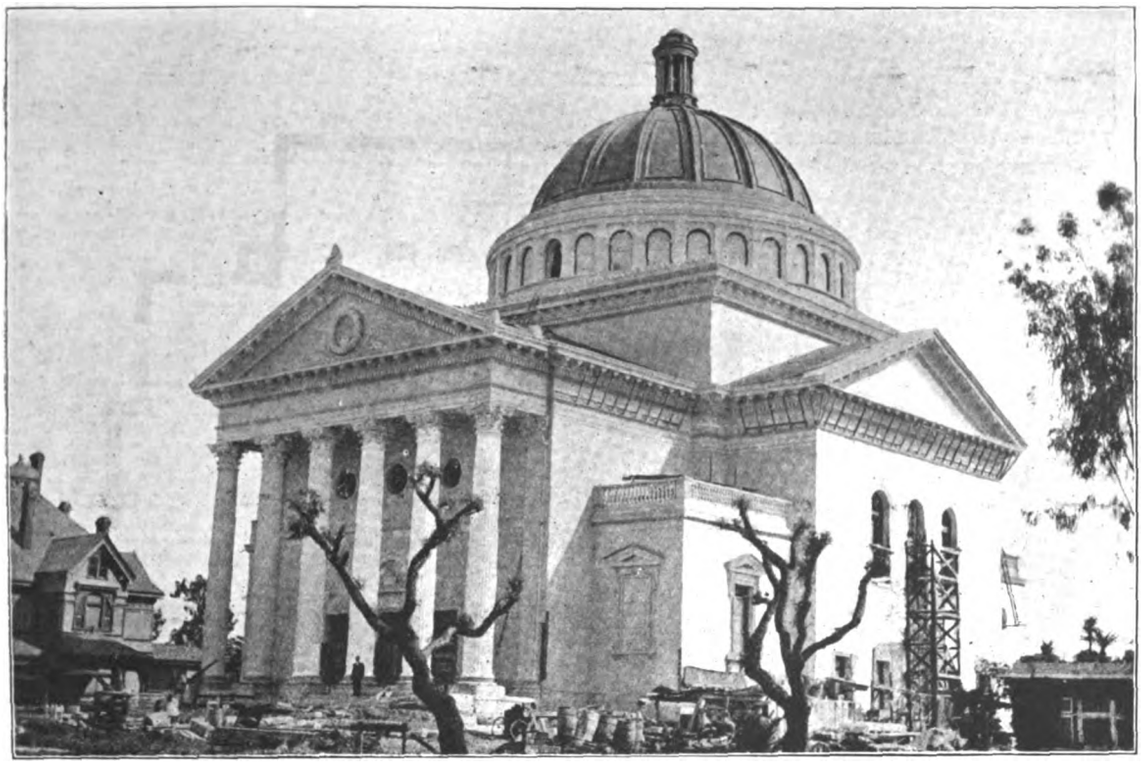
Photo by A. E. WALSHAM, 60 Doughty Street, W.C.

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OXFORD COLLEGE SERIES. No. 52.—KEBLE: INTERIOR OF CHAPEL.

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SECOND CHURCH OF CHRIST, SCIENTIST, LOS ANGELES.

SECOND CHURCH OF CHRIST, SCIENTIST, LOS ANGELES, CALIFORNIA.

THE Second Church of Christ, Scientist, now nearing completion on West Adams Street, Los Angeles, California, represents an expenditure of a trifle in excess of $300,000, and is one of the most important and at the same time the most costly Christian Science church west of New York city.

The structure occupies a ground area of about 100 by 150 feet, and is centrally located on a plot of ground fronting 200 feet on West Adams Street, by a depth of 250 feet, thus affording ample opportunity for landscape effects. The design is Italian Renaissance in modified form, the Corinthian order having been adopted for the entrance portico. In plan, the main auditorium, having a seating capacity of 1,200, without galleries or obstructions of any kind, is in the form of a Maltese cross. Its dimensions are 93 by 106 feet, surmounted by a dome 70 feet in diameter, the crown of which is 96 feet above the floor.

The treatment of the walls and vaulted ceilings, as well as the dome proper, is strictly architectural and is executed consistently in all of its minutest details. The high panelled wainscotting, the doors and pew seating, and all other wood work is of selected mahogany stained a soft brownish tone, while the floor will be completely covered with interlocking rubber tile of harmoniously contrasting colours.

The terraced approaches to the portico are spacious and have an air of quiet elegance and dignity. The entrance vestibule is generous in proportions, 3 feet in height and terminating in a groined arched ceiling. This vestibule communicates directly with the foyer, 32 by 65 feet in size, of clear, unobstructed space with tiled floor, marble wainscotting, beamed and panelled ceiling and large twin marble fireplaces at either end. To the right and left of the foyer are located the main stairways leading to the auditorium, while twin tunnel stairways lead directly ahead and land in the centre of the auditorium. In addition to these, two commodious rear stairways are provided and are reached from the side or Sunday-school entrances. In the rear of the foyer is the Sunday-school with a seating capacity, in cases of emergency, such as overflows, &c., of over 800 and with special arrangements for children's classes.

Cloak and toilet rooms, also literature and ladies' retiring rooms are contiguous to the foyer. In the rear of the auditorium are provided the readers' rooms with adjoining private toilets; the secretary's and directors' rooms with all necessary conveniences, and an ample loft to house the great organ. A complete modern and thoroughly equipped heating and ventilating plant is about to be installed, also a vacuum dust-cleaning apparatus.

Reinforced concrete has been largely employed in the construction of this church, making it substantially fireproof. The dome is a noteworthy feature and is said to be the largest concrete dome, not only in the United States, but in the entire world, nothing of the like having before been attempted.

The materials used in the exterior of the church are light grey granite for the lower part, while the walls are faced with a matt or dull-glazed white brick and trimmed with terra-cotta of the same colour and texture. The dome and lantern surmounting it are covered with heavy copper, and the gabled roofs with an olive green dull-glazed shingle tile.

The building rests on a stratum of gravel. In designing the foundations a bearing power of 3,000 lbs. per square foot was assumed, and the dead loads only were considered.

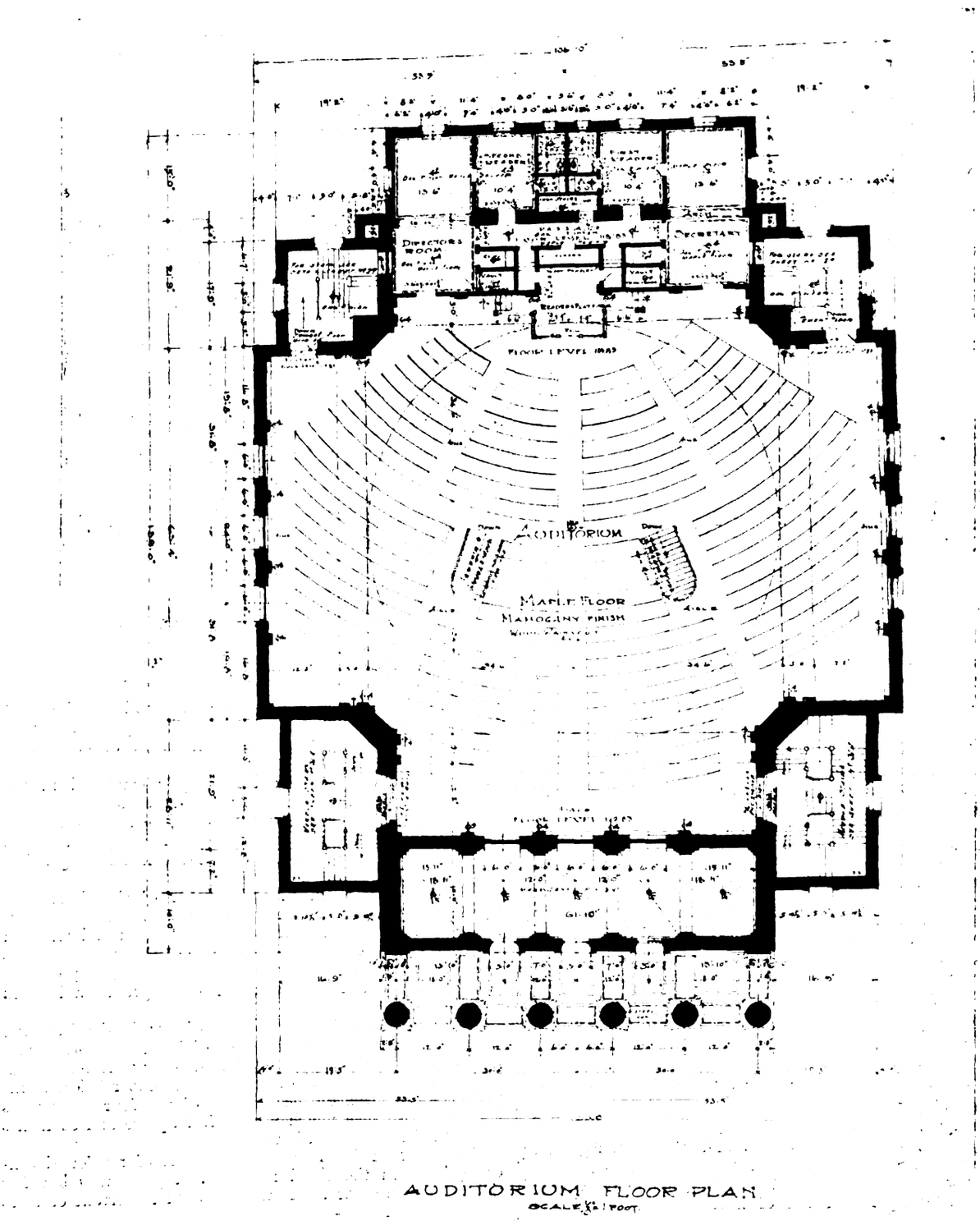
The foundations are of concrete without reinforcement, with the exception of the footings of the four great piers carrying the dome, which was 18 feet square and 30 inches thick reinforced twisted bars.

The floors, roofs, stairways, &c., are of reinforced concrete, built in the usual manner and presenting but few points of particular interest. The most important of these are the following:—

The floor over the foyer is carried on beams, spaced 12 feet on centres, having a clear span of 35 feet, but, owing to the pitch of the floor of the auditorium, these beams are but 26 inches deep at one end. The columns carrying the floors are generally 14 inches square reinforced with four ¾ inch twisted bars, wrapped spirally with No. 6 gauge wire, spaced 2½ inches on centres. The maximum load on these columns is 500 lbs. per square inch on the area enclosed by the reinforcement.

The four piers carrying the dome and its supports, consisting of a dead load of 1,400 tons, have each an area of 10 square feet, and are reinforced by a steel column made of four 3-inch by 3-inch by ⅜-inch angles spaced 28 inches from back to back, double latticed with 2½ inches by ¼-inch bars, and additional reinforcements of three 3-inch by 3-inch by ⅜-inch tees in the outside corner. The four concrete girders connecting these columns have a clear span of 68 feet, and are 20 feet deep at the supports, 10 feet deep at the centre, finishing 16 inches thick. These girders are reinforced by hollow steel trusses and twisted bars as shown in the accompanying detail. These steel trusses were designed

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PLAN, SECOND CHURCH OF CHRIST, SCIENTIST, LOS ANGELES.

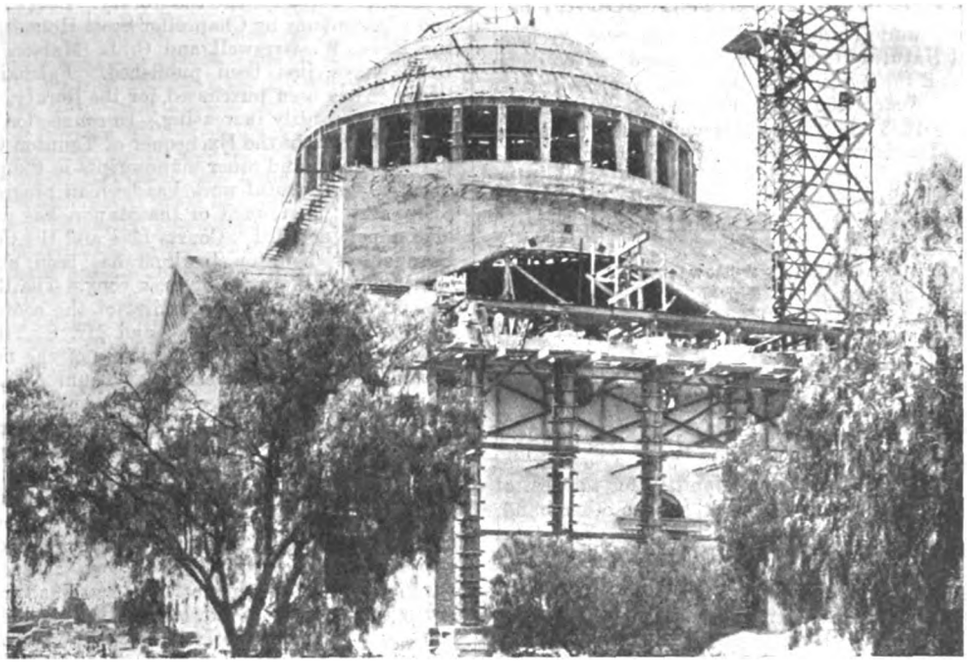
and built to carry the weight of the forms and wet concrete and to take some of the tensile, compressive and secondary stresses due to the loads of the completed structure. Additional steel was used both in the upper and lower parts of the girder, as shown, to take the remaining stresses.

In constructing this work the steel columns were assembled in their full length and hoisted to and guyed in their final positions. Short cross arms were secured to the tops and the steel trusses hoisted by block and tackle and hung from these arms. After the four trusses were secured in their correct position, four hollow latticed girders 30 feet long and 5 feet deep were bolted to them across the corners, at an angle of 45 degrees. The centres of the trusses and the girders are points of support for the dome. Eight additional points of support are located at the centres of eight intermediate concrete beams on lines tangent to the dome and are supported at their ends by the trusses and girders.

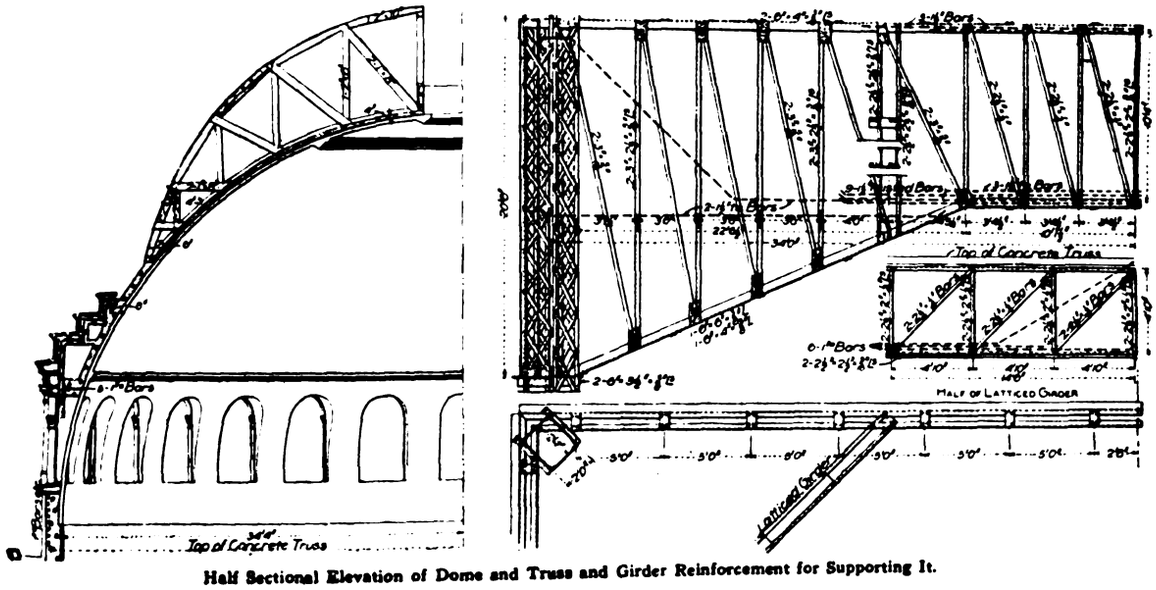
The concrete for the piers, girders, dome and roofs was hoisted in a concrete bucket to a point about 30 feet above its final resting place and then dumped into a 7 inch sheet iron pipe, which conducted it to its forms. This pipe had a swivel joint at the centre of the building, which facilitated the delivery of the concrete uniformly in the forms on all sides of the building.

Three ¾-inch bolts were imbedded in the concrete of the trusses and the girders directly below the centres of each of the columns of the dome, and 4-inch by 4-inch blocks were afterward secured by these bolts and formed the supports for the outer ends of 32 radial trusses, which supported the forms for the dome. The other ends of these trusses were

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SECOND CHURCH OF CHRIST, SCIENTIST, LOS ANGELES.
CENTERING AND FORMS IN POSITION FOR CONCRETE.



Half Sectional Elevation of Dome and Truss and Girder Reinforcement for Supporting It.

SECOND CHURCH OF CHRIST, SCIENTIST, LOS ANGELES.

carried on a 16-foot square wooden tower erected on the floor of the auditorium. The rough boarding of the form of the dome was made up in sections and hoisted into position. The first section of the dome consists of a 3-foot ring 16 inches thick, bearing on the beams, girders, and trusses, and reinforced at the bottom with two 1-inch bars and on the outer face with six 1-inch bars. The next section of the dome, as constructed, consisted of the 32 columns and a horizontal circular ring connecting the tops of these columns. The columns have a minimum section of 12 inch by 14 inch, and are reinforced with four ¾-inch twisted bars wrapped spirally with No. 6 wire, spaced 2½ inches on centres, the ends of the bars projecting 6 inches or 8 inches into the lower and upper rings. The upper ring is 16 inches deep and about 28 inches wide, and is reinforced with five 1-inch twisted bars on its outward face. The shell of the remainder of the dome rests on this upper ring or girder and is 8 inches thick at the base and 4 inches thick at the crown, the horizontal reinforcement consisting of ½-inch twisted bars spaced 6 inches and 12 inches on centres, while the same bars were spaced 18 inches on centres in the opposite direction. The forms of the dome were removed 90 days after the concrete was placed and after all the terra cotta had been set in position. The deflection of the trusses was between ¼-inch and ⅜-inch, while the deflection of the dome was only $\frac{1}{16}$ of an inch.

Galvanised iron wires were imbedded in the concrete for anchoring the brick and terra cotta facing, and, as all this work was grouted with concrete, a very strong bond was secured.

Mr. A. F. Rosenheim was the architect of this building and Mr. A. C. Martin was the structural engineer. The C. J. Kubach Company was the contractor.

Mr. David Davies, M.P., has intimated his intention to provide at the joint cost of himself, his mother and his sisters a new college hall and men's hostel for the University College of Wales at Aberystwyth. The cost is estimated at 8,000*l.* The idea is to provide a college hall, with subsidiary accommodation, capable of enabling fifty professors and 300 students to dine together, and ultimately to afford full residential accommodation for all students of the college, both ordinary and "normal." Mr. Davies hopes that this plan will strengthen the sense of corporate life in the college, and also assist in bringing the teaching profession within the sphere of university education in Wales, instead of restricting their education within detached training colleges, and so cutting them off from the main current of higher education in Wales.

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SOMERSET ARCHÆOLOGICAL SOCIETY.

THE sixty-first annual meeting of the Somerset Archæological and Natural History Society opened at Wells on the 12th inst., and the proceedings extended over the greater part of the week. Nearly 200 members of the Society participated. It was in 1888 the Society last visited the cathedral city. The annual meeting was held in the Guildhall on the 12th inst., under the chairmanship of Mr. A. F. Somerville, High Sheriff. The Bishop of Bath and Wells was elected president for the ensuing year. The annual report contained the following:—

Since the last report sixty-four new names have been added to the list of members. The losses by death and resignation have been thirty-five; altogether the net gain has been twenty-nine. The total membership at date is 795 against 767 at the time of the annual meeting last year. The balance of the account at the end of 1907 (the general account and the Castle Restoration Account of former years having now been combined) was 168*l.* 18*s.* against the Society. At the close of 1908 there was a deficit of 216*l.* 9*s.* 8*d.* In neither case was the liability for the cost of the volume for the year then expired, or, on the other hand, any unpaid subscriptions, taken into account. The total expense attending the issue of Vol. LIV. (for 1908), including printing, illustrations and delivery, has been 130*l.* 17*s.* 8*d.* No less than fifty plates and drawings were included in this volume, the greater part of the cost being kindly defrayed by the Wick Barrow Excavation Fund, the Norton Camp Excavation Fund, the Rev. F. W. Weaver, Mrs. Bramble, and Mr. F. Bligh Bond. Thanks are also due to the publishers of "The Reliquary," the Oxford University Press, Mr. Francis Bond, and the editors of "Somerset and Dorset Notes and Queries" for the loan of blocks. Various photographs and drawings for the volume were provided by Mr. F. Bligh Bond, Mr. H. St. George Gray and Mr. Reginald Weaver. In commemoration of the Diamond Jubilee of the Society a scheme was proposed at the Taunton meeting last summer for annexing the apartments in the Castle, formerly occupied by the curator, for the purpose of the extension of the museum and library. The details of this scheme were presented in the last annual report, when it was considered necessary to raise a sum of 650*l.*, including 175*l.* required for the improvement and reparation of Castle House, now the curator's residence. After various promises of donations last autumn a printed appeal was issued in the spring and sent out to all members. A fair response was made, and the fund now stands at about 320*l.* Every detail of the proposed alterations has been dealt with by the building sub-committee and their architect, and the general committee earnestly solicit further donations in order that this very necessary and desirable work may be proceeded with as soon as possible. The museum has been enriched during the past year by a steady flow of acquisitions, although there have been no large collections presented or bequeathed. The Wick Barrow Excavation and Lecture Fund has raised money sufficient to provide a good polished mahogany showcase for the relics found in the barrow and the model of the area. The prehistoric boat from Shapwick has now been placed on an ebonised stand, and when all moisture has evaporated the broken parts will be set up by means of iron brackets, &c. The Meare Lake Village relics found in the trial excavations by Mr. Arthur Bulleid last year have been presented. The Rev. A. M. Foster has presented the staff of office of the ancient borough of Newport, North Curry. Dr. and Mrs. Hopkins have added several new specimens to the collection of the brass emblems of Somerset village clubs. Mr. F. J. Barnes has given a cinerary urn from a large barrow at Portland. The old Sheriff's carriage of Somerset, bearing the arms of Barrett and the crest of Speke, has been presented, through the kindness of Mr. J. Standfast. Several framed portraits of Somerset worthies have also been presented. The Ham Hill collection of Roman and other antiquities has been added to by Mr. Hensleigh Walter. Mr. Kenneth Hayward has collected a large number of flint implements and flakes from the surface on Creech Hill and at Godminster, near Bruton, and sent them to the museum. Mr. Courtney Gardner has obtained a large series of shards of Roman pottery and a few other objects from Larkhill Lane Quarry, Preston Plucknett, Yeovil, which he has given to the county collection. The most valuable addition to the library during the year is the original chartulary of Mynchin Buckland Priory, of the early fourteenth century, bequeathed to your Society by the late Mr. J. Brooking-Rowe, F.S.A. Probably the most notable and complete archæological work, recently issued in two volumes, relating to Somerset, is Sir Henry Maxwell Lyte's "History of Dunster," now added to the library. Books relating to Wells and Glastonbury by Chancellor Scott Holmes, Canon Church, the Revs. W. Greswell and C. L. Marson and Mr. Bligh Bond, have just been published. Fairbairn's "Book of Crests" has been purchased for the library. The use of the library is steadily increasing. In connection with the manuscripts housed in the Exchequer of Taunton Castle belonging to the Manor, and other manuscripts in the possession of the Society, some useful work has been in progress. Mr. H. B. Sheppard, the steward of the Manor, has produced a valuable paper, entitled "Courts Leet and the Court Leet of the Borough of Taunton," which has been published and is obtainable at the price of 1*s.* a copy. The Rev. A. J. Hook has prepared a manuscript list of the contents of the Exchequer of Taunton Castle; and Mr. C. Tite has arranged for the compilation of a catalogue of the manuscripts contained in the Serel collection at Taunton Castle, a work on which Mr. A. J. Monday is already engaged. An interesting series of four lectures on archæological subjects—on two occasions by Mr. Bligh Bond and on single occasions by Mr. St. George Gray and the Rev. C. W. Whistler—were given at Taunton Castle during last winter in aid of special funds. The Taunton Field Club have for several years continued to use the Castle for the purposes of their conversaziones and lectures; and as long as space is available winter lectures at the Society's headquarters should be encouraged. Owing to excavations having been conducted in this county during the last few years on scientific lines, the Society has attained a high position in archæological field-work, a fact which has been commented upon from time to time in the Press. Among the most notable of these excavations are those which have been carried out at Glastonbury Abbey, the Glastonbury Lake Village, Wick Barrow, Castle Neroche, Small Down Camp, Norton Camp and Lansdown (the latter under the care of the Bath branch). Mr. F. Bligh Bond has continued the excavations at Glastonbury Abbey during the present year; and Mr. H. St. George Gray completed the first portion of his work at Charterhouse-on-Mendip in June last. Excavations under the charge of Messrs. Balch and Troup have also been in progress in Wookey Hole as opportunities have occurred; and Mr. Bulleid intends to dig two sections through Ponter's Ball this season. It is anticipated that excavations at the Meare Lake Village will be begun next year. The undertaking will be a costly one and will probably extend over several years; subscriptions are already being collected for this purpose, the list being headed by a gift of 100*l.* from Lord Winterstoke. The various owners of the greater part of the land comprising this lacustrine habitation have signified their approval that the antiquities discovered shall be exhibited in the museum and become the property of the Society. Messrs. Bulleid and Gray hope to be in a position to publish Vol. I. of the quarto monograph on the Glastonbury Lake Village next spring. It will be profusely illustrated and printed privately for subscribers. Through the munificence of Mr. George A. Wills, Stokeleigh Camp and Leigh Woods, on the Somersetshire side of the Avon, have been saved from threatened disfigurement by the builders who are overrunning that part of Clifton. Although the property will pass into the hands of the National Trust, a local committee of management is being appointed who will undertake the conservation of the camp. It is understood that an endeavour is being made by the National Trust to secure for the public an opportunity of purchasing a part of the Cheddar Cliffs. If the Trust is successful in its negotiations and the public support it by subscribing the purchase money, an important step will be taken towards securing the preservation of the beauty of the gorge and ending the quarrying operations which are so damaging its beauty and amenities. Various members have suggested the formation of sub-committees, or sections, throughout the county, specially to promote the study of local entomology and ornithology, and later on probably of other branches of natural history also. The committee will gladly welcome any suggestions bearing on this subject. Mr. H. St. George Gray, the assistant secretary and curator, having held office for the period of eight years in April last, the committee unanimously agreed to increase his salary by 20*l.* a year, and expressed their cordial appreciation of his services and of his zealous endeavours, and they desire to congratulate him on the warm appreciation of his work in connection with archæological excavations which is frequently expressed by antiquaries of high repute. The museum was visited by 7,902 persons during 1908, including 1,655 visits from members, an increase of 67 per cent. since the beginning of the century; 3,335 persons have visited the Castle during the first six months of 1909, which shows an increase of 11 per cent. compared with the same period of

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last year. In rendering this report more complete it will be appropriate to record that the millenary of the foundation of the See of Wells was celebrated on June 22, with due pomp and dignity. At noon on that day the Prince and Princess of Wales arrived at the west door of the cathedral church, where they were received by the Archbishop of Canterbury, the Bishop of Bath and Wells, and the Dean and Chapter of Wells. In a forcible sermon the Primate reminded his hearers that just a thousand years ago, in Canterbury Cathedral, Archbishop Plegmund consecrated seven priests to be bishops, one of these being Athelm, the first Bishop of Wells. Subsequently there was an impressive ceremony at Glastonbury, where the Bishop of Bath and Wells and his co-trustees, Mr. R. Neville Grenville and Mr. A. F. Somerville, committed the future charge of the abbey to the Archbishop of Canterbury and an Advisory Council. The task of rendering the present ruins safe and of preventing their further decay is being undertaken by Mr. W. D. Caröe, F.S.A., whilst Mr. F. Bligh Bond, F.R.I.B.A., is still engaged in his interesting excavations at the abbey.

BRITISH CONSTITUTION ASSOCIATION CONFERENCE ON TAXATION OF LAND VALUES.

THE Chancellor of the Exchequer received on Thursday, July 16, the deputation appointed by the first meeting of the Conference, when the organisations represented included the following:—

Albion Permanent Benefit Building Society (Liverpool), Society of Architects, Auctioneers' Institution of the United Kingdom, Berks and Oxon Chamber of Agriculture, Birkbeck Bank, Birkbeck Building Society, Birkbeck Freehold Land Society, British Constitution Association, British Land Co., Ltd., British Law Life Insurance Company, British Savings Fund and Permanent Benefit Building Society (Liverpool), Building By-Laws Reform Association, Cavendish Land Co., Ltd., Chatham Cottage Owners' Association, Central and Associated Chamber of Agriculture, Central Permanent Benefit Building Society, Central Perpetual Benefit Building Society (Liverpool), Commercial Union Assurance Co., Ltd., Constitutional Permanent Benefit Building Society (Liverpool), Devon and Exeter Architectural Society, Eagle Insurance Company, Enterprise Permanent Benefit Building Society (Liverpool), Equitable Permanent Benefit Building Society (Liverpool), Estate Agents' Institute, Glasgow Property Owners' Association, Hand in Hand Permanent Benefit Building Society (Liverpool), Imperial Property Investment Co., Ltd., Incorporated Association for the Protection of Property Owners, Islington Permanent Benefit Building Society (Liverpool), Land and House Property Corporation, Ltd., London Friendly Institution, London Master Builders' Association, Leeds Permanent Benefit Building Society, Liverpool and District Property Owners and Ratepayers' Association, National Freehold Land and Building Society, Old England Permanent Benefit Building Society (Liverpool), People's Investment Co., Ltd. (Reading), People's Land, Building and Dwellings Co., Ltd., Provident Permanent Building Society (Exeter), Quadrant Insurance and Debenture Company, Royal English Arboricultural Society, Royal Institute of British Architects, Rural Labourers' League, Scottish Land and Property Federation, Seabrook Estate Co., Ltd., Second Equitable Permanent Benefit Building Society (Liverpool), Second Globe Permanent Benefit Building Society (Liverpool), Soho Permanent Benefit Building Society (Liverpool), Sunderland Working Men's Permanent Building Society, Surveyors' Institution, Universal Permanent Benefit Building Society (Liverpool), Wellington, Wiveliscombe, Milverton and West of England Building Society, West End Property Investment Co., Ltd., Western Suburban Permanent Building Society, Woolton Permanent Benefit Building Society.

Mr. Mark H. Judge, hon. secretary to the Conference, read the following memorial which had been prepared by the conference committee:—

Memorial re *Land Tax Proposals.*

To the Rt. Hon. Herbert Henry Asquith, M.P. (Prime Minister), the Rt. Hon. David Lloyd-George, M.P. (Chancellor of the Exchequer), and the other members of His Majesty's Government.

From representatives of organisations connected with land, and others.

This memorial sheweth:—

Your memorialists met in conference at the Whitehall Rooms on May 14 last to consider the land tax resolutions, when it was unanimously agreed to appeal to His Majesty's Government to withdraw from the Budget the proposals for the taxation of land values. (A report of the proceedings of the meeting is appended to this memorial.)

2. These proposals involve a violent departure from the principle which has hitherto exempted from taxation the capital as distinct from the income of living persons, and if adopted would constitute a most mischievous precedent, and seriously affect public confidence in relation to property which has always been regarded as secured to the individual owners by the guarantee of the State.

3. Any claim on the part of the State to a percentage of the increment value of land would inevitably decrease its value as compared with all other forms of property, out of all proportion to the extent of the prospective claim, while the adoption of such a method of taxation would induce a belief in the public mind that land would from time to time be singled out for further special burdens.

4. In practice the taxation of increment value would lead to extraordinary anomalies and injustice. For instance, land companies which buy land wholesale and sell retail are engaged in the very work of development which the Finance Bill profess to assist; yet as the Bill is framed the plots into which, as part of their business, they divide the land would, while they remained unbuilt on, be subject to the duty of ½*d.* for every pound of their capital value—which would be in effect to tax a tradesman on the stock which for the time being he had on hand and was unable to sell—in other words, to penalise him for trading in land.

5. Again, land cannot as a rule be placed on the market without considerable current expense for management, office rent, surveys, road-making, advertisements, auctions, &c. For payment of these expenses and for providing interest on capital borrowed and dividends on capital subscribed, practically the only source to which a land company can look is the difference between the book value and the selling price of the land in which it deals. Of that difference the Bill proposes to confiscate one-fifth, leaving four-fifths, out of which the whole of the administration expenses are to be met and the losses incurred in lean years made good. It is not too much to say that unless the sales are much more rapid and remunerative than is usual, no dividends would under these circumstances be paid by a land company, that most existing land companies would be absolutely ruined, and that this form of enterprise would become a thing of the past.

6. Some idea of the extent of the transactions of land companies may be gathered from the fact that one of the organisations represented by your memorialists has during its existence sold land to the value of about 5,000,000*l.* sterling. It is impossible to estimate with anything like accuracy the total amount of land sold through the operations of similar organisations, but there is no doubt that they have done a great and beneficial work in the direction of distributing land among the people.

7. From the shareholders' point of view land companies have not, as a rule, been very successful, and all chance of success would be gone if the increment taxation were imposed. The increased tax would not be the only new burden they would have to bear. Though their business is to develop land, the land which they have not for the time being succeeded in selling would apparently be regarded as "undeveloped," and be liable to the undeveloped land duty.

8. The proposed duty on land which is not fully developed is open to the most serious objection on the ground that it constitutes a charge on a hypothetical value which may never be realised, or which may only be realised at a period so remote as to result in a loss to the individual owner who during the period of waiting has received less interest than would have been the case had his capital been invested in Consols, or, indeed, as is often the case, no interest at all.

9. It is obviously unfair to subject to a new tax land which can only theoretically be used more profitably than at present. Such a tax might absorb a large part of the rent now derived from the land, and as it would be a first charge on the property the interests of holders of rent charges and mortgagees would be in many cases seriously jeopardised. It is perfectly well known that in many urban districts which are stationary, or where there is only a slow growth of population, there is no demand for land for building purposes for long periods, and the vacant land in such urban districts, if used at all, can only be used for allotment or agricultural purposes. Under these circumstances the income from the land might not be sufficient to pay the proposed tax and other existing charges, and thus the interest of the owner might be entirely absorbed.

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10. One of the professed objects of the Bill is to increase building and cheapen houses. The proposed reversion duty would operate the other way. It is too often forgotten that the supply of new houses depends in the main on the operations of the enterprising builder who puts up buildings for which he thinks there will be a demand, and takes the risk of the market.

11. It is quite unusual for the man in want of a house to build the house for himself. The building-lease system suits the enterprising builder because it does not involve a lock-up of capital in the purchase of the fee simple. A reversion duty which would tend to increase the ground rents demanded and make owners more reluctant to grant such leases would clearly discourage builders, who would also, of course, be discouraged by the increment duty.

12. It is notorious that insurance companies, friendly societies, charity trustees, great public bodies and trustees for private persons hold an enormous mass of these reversions and also of mortgages of land. Their finance would be disturbed and their legitimate calculations upset by the proposed taxes, and a heavy blow would be dealt to the security of institutions in which a large part of the savings of all classes, and not least the working classes, have been directly or indirectly invested.

13. The proposed legislation would introduce complications and increase costs in connection with the purchase, sale and leasing of land, and is entirely opposed to the principle of free trade in land. It appears to be based on the idea that unearned increment on land is "regular, normal and progressive." This is very far from being the case. The value of land, as of other commodities, goes up and down, and though on the whole and in the long run there may be an increase, yet in large districts and for long periods there is often a steady decline.

14. The valuations and re-valuations suggested in the Bill would cause endless trouble, inconvenience and expense, and could never be put on a satisfactory footing.

15. The immediate effect of passing the Bill would be to depreciate the capital value of nearly all interests in land, probably to an extent much greater than would be shown by strict actuarial calculations.

16. This loss would fall on the persons who for the time being have the misfortune to be owners of land. Future purchasers would buy with their eyes open, and would make their offers with a knowledge of the liabilities they would incur. But although existing owners would be the heaviest sufferers, future purchasers would also be continually harrassed by the uncertainties of their position and the increased anxiety and expense which the possession of landed property would entail.

17. If the needs of the State should at any time call for a tax on increment value, it should obviously be *pro rata* on property of all kinds, and not on one class of property, whether that property be land or anything else. The adoption of the land taxation proposed in the Bill could not do other than induce a belief in the public mind that ordinary moral considerations were not in future to prevail in relation to property in land.

18. The land tax proposals of the Bill appear to your memorialists to be so unjust and impolitic that they venture to hope that this appeal to His Majesty's Government to withdraw these proposals will not be in vain.

The following members of the deputation then spoke:—

Lord Hugh Cecil, Mr. Herbert Michell (British Land Company), Sir William Chance (British Constitution Association), Mr. George Hubbard, F.S.A. (Royal Institute of British Architects), Mr. G. A. T. Middleton (Society of Architects), Mr. Edwin Evans (Incorporated Association for the Protection of Property Owners), Mr. Edward Bond (formerly M.P. for Nottingham). Mr. Alex. R. Stenning (President of the Surveyors' Institution) was unavoidably absent, and the remarks he would have made were handed in.

The Chancellor of the Exchequer, after complaining that the speeches to which he had listened consisted mainly of the sort of political arguments which he had heard for months, said that the advantage of deputations was that they enabled Ministers to hear at first hand from the persons interested what their view was. There were gentlemen there who could give him invaluable facts, but this they had not done. They had the whole of the facts at their command, and if they could demonstrate that any part of the Bill was unworkable, or inequitable, or unjust, he invited them to send these facts to him, and they should receive his careful examination.

GAS HEATING RESEARCH.*

(Continued from last week.)

Temperature Measurements.

ALL thermometers were on the Centigrade scale, and were constantly checked for accuracy. The flue temperatures were taken continuously by means of an electrical resistance thermometer and registered on a Callendar recorder placed on the wall in the main building. With proper attention it worked satisfactorily. The temperatures of the air in the experimenting room were determined by placing thermometers on all the walls in different positions, and hanging from the ceiling in the middle of the room—the bulbs of all being protected from direct radiation from the stove by placing each in the shadow of a piece of asbestos. The temperature of all gases passing through the various meters was taken by fixing thermometers into the meters above their water levels.

Calorific Values.—These were determined by means of a Boys' calorimeter, the water being weighed instead of measured, and the net values determined by weighing the water condensed over half-an-hour, and checking this by calculating the amount of water produced during combustion from an analysis of the gas. The latter figure was always a little higher than the former, the escaping products of combustion having a slightly higher percentage saturation than the atmosphere.

Coal-Gas Analyses.—These were all done on the "Bone and Wheeler" apparatus, in which all measurements were made at constant volume. Complete analyses for CO_2,O_2, unsaturated hydrocarbons, CO,CH_4,H_2, and N_2 were accurately made in about eighty minutes. Nitrogen was taken by difference. A typical analysis is as follows:—

CO_2	.14 per cent.
O_2	.41 per cent.
Unsaturated hydrocarbons	3. 9 per cent.
CO	6. 3 per cent.
H_2	39.04 per cent.
CH_4	33. 9 per cent.
N_2	16.27 per cent.

Gas-Rates.—These were estimated by noting the time taken by a cubic foot of gas to pass through the meter, correction being made by reducing the volume to 0 deg. C. 760 mm. pressure, dry. The pressure of the gas at the meter was allowed for.

The Meteorological Conditions.—These were obtained from the "Cecil Duncombe" observatory, close to the laboratory. The barometric pressures which were required for each volumetric calculation were got from a barometer in the analytical laboratory.

Experiments with the Open Gas Fire.

The stove used in the tests was of the simplest type and of normal size.

It consisted of seven Bunsen burners all connected with the same air and gas supplies, which were adjustable. Combustion took place within seven pieces of open fire-clay fuel, and the tips of the flames and hot products passed through similar material arranged across the top of the tube-like fuel. The stove had a thick fire-brick back, and the gaseous products passed out by means of a hole (4¼ inches by 1⅛ inches) into the copper flue already described. The whole was surrounded by a cast-iron framework. The fire-clay front measured 9 inches by 9 inches.

The air supply to the burners was so arranged that, after getting a distinct inner cone, it was adjusted until a slightly hazy inner cone was obtained. The flame was of such a size and shape that the outer cone, where combustion was being completed, very slightly impinged on the fire-clay fuel. The space beneath the fuel and round the burners was filled in so that the heat of the fire caused as little draught as possible through the fire with consequent loss of heat. The average gas consumption was 17 cubic feet per hour, and the net calorific value about 142 calories (571.4 B.Th.U's.).

The Estimation of Radiant Energy Sensible as Heat.

The chief work done since November has been the devising a method of estimating quantitatively the percentage of

* Extract from report of the Gas Heating Research Committee appointed by the Institution of Gas Engineers in conjunction with the University of Leeds, and consisting of Messrs. John Bond, J. H. Brearley, and Charles Wood, in co-operation with Professors Arthur Smithells (Chairman), William A. Bone, and Julius B. Cohen, of the University of Leeds, and Mr. E. W. Smith (Research Chemist), to the Institution of Gas Engineers, at their Annual Meeting held in London during June, 1909.

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energy radiated as heat from the usual type of open gas fire. The two main points that presented themselves were:—Firstly, to decide on the most suitable, and at the same time a sufficiently accurate means of estimating the rate of reception of radiant energy at any given point; and, secondly, to so apply this means as to be able to determine quantitatively the total energy radiated from the whole area of the heated surface. Sir John Leslie, a pioneer in research on radiation, used a differential thermometer, consisting of a U tube with a bulb at either end, one of the bulbs only being exposed to radiation. This instrument is not sensitive enough, and, owing to the conditions of the work, would not be at all suitable.

Langley used an instrument which he called the bolometer.* This is very sensitive, portable, and receives radiation in every direction. Its principle is that of an electrical resistance thermometer, and is extremely simple to use. The radio-micrometer invented by D'Arsonval, and subsequently improved by Boys,† is also extremely sensitive, but not so handy as the bolometer. Its principle is that of the single thermo-junction and mirror galvanometer in one instrument.

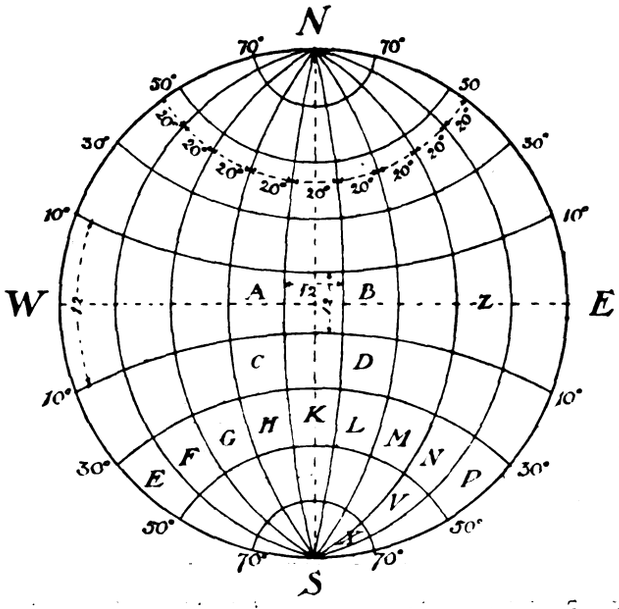
The thermopile was the instrument eventually adopted, and, with proper precautions, has proved eminently reliable. It was of the Rubens type, and consisted of twenty junctions of iron and constantan wires in series, every alternate junction being shaded and at the room temperature, and the remaining junctions exposed to the radiation. An electric current is set up flowing from one to the other, proportional to the difference in temperature of the hot and cold junctions. The current was shown on a Paul single-pivot galvanometer in milli-volts. There was also a temperature scale on the galvanometer, which could be brought into use by putting 10 ohms into the circuit by means of a convenient switch. The temperature scale having a much smaller range of deflection, the milli-volt scale was always used. As the temperature of the room affected all the thermo-junctions to the same extent, no increased difference in deflection of the galvanometer was shown by variations in the room temperature. Nevertheless, the galvanometer was always brought to zero after each reading, and any slight differences in its internal resistance allowed for.

When a satisfactory method for registering the comparative radiation intensities at various points was found, additional means had to be adopted for estimating the total radiated energy emitted from the heated surface. It would have been possible to absorb all or most of the radiations; but the method would have been so long and tedious that at the end of the experiment there was every likelihood that most of the conditions of the experiment would have changed. The method adopted was as follows. It was known that energy would be radiated to every point from which the fire was visible. If, then, the radiated energy could be estimated the problem was solved. A promising instrument for making this measurement was found in a so-called radiometer designed by Professor R. H. Smith, and with this the experiments were made. This instrument consisted of a surface 12 inches square, composed of flattened copper tubes, connected in series, through which a current of water was caused to flow.

The tubes were close together and lampblacked, besides being protected by a lampblacked sheet-iron hood to protect the surface of the tubes from warm convection currents. Water was run through the tubes from a constant level and left the apparatus at a constant level, thus ensuring an even flow. Thermometers were so placed that the temperature of the water could be taken on entering and leaving the tubes. In using the instrument it was placed facing the source of radiation, so that the radiant energy falling on the 12-inch square surface of tubes might be absorbed, and the water passed through the instrument raised in temperature.

By taking the temperature of the water as it entered and left the radiometer, the average rise in temperature was obtained. From the average rise in temperature and the weight of water flowing through in a given time, the heat equivalent in calories of the radiations falling on the radiometer surface per hour was calculated. The size of the hemisphere upon which the radiations fell had to be determined. It depended on the size of the radiometer. This was 12 inches square. The circumference of the hemisphere should be exactly divisible by 12, and the radiometer in one position should be directly opposite the stove. It was decided that the semicircle forming the circumference of the hemisphere should be 108 inches in length, this being divisible by the width of the radiometer, 12 inches. There would then be four divisions on the equatorial rod, on either side of the centre division, or nine in all. If the half circle measured 108 inches, then, by calculation, the radius or distance from the centre of the stove to the radiometer surface or to the equator would be 34.4 inches.

When the points immediately above and below the stove (which, to carry the analogy with the earth a little further, may be considered as the North and South poles) were joined by ten meridians passing through each of the points marked off on the iron rod or equator, it was found that these lines converged at the North and South Poles at an angle of 20 deg. to one another. Parallels of latitude were then drawn 12 inches apart, starting from the poles. The surface of the hemisphere was then divided somewhat as follows, with each parallel 20 deg. above or below its neighbour (see fig.).



The Hemisphere Surface, in Front of the Stove, divided into 81 areas.

In the centre there is a 12-inch square, and there are both to the right and left of this square four equal squares in the same plane, making nine in all. Now the division N, A, C, S, D, B is exactly the same shape and area as each of the divisions to its right and left, and the parts of these divisions between the same parallels are equal, so that, for example, E, F, G, H, K, L, M, N, P are equal to one another. But the areas between the same adjoining meridians decrease as they leave the equator. It is found that these areas decrease they further they are from the equator in proportion to the cosine of the angle that the line joining the centre of the area to the centre of the stove makes with the line joining the centre of the stove and the equator.

So that the areas between
10° S and 10° N of the equator will be to the areas between 10° S and 30° S or 10° N and 30° N as 1 is to cosine of 20° =0.94.

Also the areas between
10° S and 10° N will be to those between 30° S and 50° S or 30° N and 50° N as 1 is to cosine 40°=0.766.

Also the areas between
10° S and 10° N will be to those between 50° S and 70° S or 50° N and 70° N as 1 is to cosine 60°=0.5.

Also the areas between
10° S and 10° N will be to those between 70° S and 90° S or 70° N and 90° N as 1 is to cosine 80°=0.174.

There are now 81 areas, each nine of which bears a relation to the remaining areas as 1 : 0.94 : 0.766 : 0.5 : 0.174 corresponding to the cosine of the angles of 0° : 20° : 40° : 60° : 80°.

Thermopile readings were taken at the centre of each of these areas. Then the amount of radiant energy falling on the areas was proportional to the thermopile readings, whether in milli-volts or degrees Centigrade, and to the size of the areas. The thermopile readings having been taken, all that was necessary was to multiply each reading by its proportionate factor, and the correct relative values of the radiant energy falling on all the areas constituting the hemisphere were determined. Now, by means of the Smith's radiometer, the real calorific value of the radiant energy falling on the centre area on the equator was determined,

* *Nature*, vol. xxv., 1881, p. 14.
† *Philadelphia Transactions*, 1889 A., p. 158.

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and knowing this, the remaining values were calculated and totalled, giving the total radiated energy received on the surface of the hemisphere.

Radiation Determinations.

The first few experiments were preliminary, and were done for the purpose of finding the best conditions under which the determinations should be made and the precautions that must be taken that reliable results may be obtained. Considerable difficulty was caused by the fact that the coal gas from the towns supply would vary in its calorific value by 3 per cent. during the course of an experiment. Should a change take place during a radiometer determination, this might cause a serious error. If the calorific value rose, then the figures for the percentage energy radiated would be high. This is the probable explanation that is offered for the slight discrepancies that occur between figures obtained from experiments performed under otherwise similar conditions.

The first three experiments had for their object the determination of the percentage energy radiated above the floor level, *no* account being taken of that radiated to the floor. These had an average of 26 per cent. Subsequently, it was thought that greater accuracy would be obtained if the stove were raised some distance from the floor, in order that the heated floor should not affect the radiometer. This, and another change which will be indicated later, made a difference in the energy radiated of about 4 per cent., which would bring the above figure (26) down to about 22. This agrees with the mean of later determinations (experiments 6 to 11). The fan in the flue, used in the earlier experiments (1 to 14) for the purpose of maintaining a constant draught, was at half speed. The exit from the flue was nine inches square, and the volume of air passing up the flue averaged 1,500 cubic feet per hour. After the stove had been raised (40 inches from the floor), the total energy radiated from the stove was determined, and the mean of experiments 6 to 11 was found to be 31 per cent. of the total heat generated in the stove.

(To be concluded.)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect*, still pursuing its study of architecture of the Southern States, is largely devoted to the early work of the now famous architects, Messrs. Carrère & Hastings, at St. Augustine, Florida, the greater space being given to the Flagler Memorial Church, a curious conglomeration of sketch-book architecture, in which the youthful designers seem to have been impressed with a desire to show all they knew, from the doorway of the Erechtheion to the Plateresco of Spain. More satisfactory, because more restrained, is the same architects' work in Mr. H. M. Flagler's house, whilst the designs for the Grace M. E. church and parsonage are simple and unaffected. An entirely satisfactory piece of work is illustrated in the "restoration" of the Governor's Room in the City Hall of New York by Mr. Grosvenor Atterbury, which has been brought back, if not to its original condition, at any rate to harmony with its primal design.

La Construction Moderne has some useful illustrations, plans, sections and elevations, with a description of a co-operative creamery at Bayeux, Calvados; a couple of views of modern Parisian doorways, one in the Rue Th. de Bauville, of which M. Prugnaud is the architect, and the other that of the Hôtel Chatham, by M. Decaux. There is also a charmingly satirical article on the changing of the Bay of Mont St. Michel into market gardens and the inconsequential proceedings of the "Grande Commission" appointed to consider the matter. Our contemporary, like ourselves, does not desire to see the famous Mount rising from the midst of a dish of vegetables—an island of toast in a sea of spinach.

Deutsche Bauzeitung gives further illustrations of the competition drawings for proposed police buildings on the Augustiner site in Munich.

Moderne Bauformen has taken advantage of the International Photographic Exhibition at Dresden to form a topic of the work of modern architects in that city. Herr Fritz Schumacher is selected as the designer of the scenery for "Hamlet" at the Court Theatre of Dresden, and other works of the same architect are a technical high school at Leipzig and designs for several memorials, of which the most striking is that to the honour of Ludwig Franzius in Bremen, overlooking the Weser, the regulation of which stream is due to him. There are also designs by Herr Schumacher for churches at Recklinghausen and Cotta, the latter a competition design, as some by other architects are also shown—Paul Bender, William Lossow & Max Hans Kühne, Schieling & Graebner, Oskar Menzel, Rudolf Kolbe. Numerous illustrations are included of the exhibition buildings for which several architects are individually responsible. Effective simplicity is the keynote of these designs, and there is an absence of that meretricious excess of florid ornament which has almost come to be recognised as the correct thing for exhibitions.

Der Profanbau continues to find out and show us some of the most striking modern work in German architecture, such as the municipal bath establishment at Iserlohn by Stadtbaurat Falkenroth, and a new tenement house in the Camphausener Strasse, Berlin, by Friedrich Blume, of Friedenau.

The *Engineering Record* gives us a valuable paper, read before the American Society for Testing Materials, by M. O. Withey, on the tests made in plain and reinforced concrete columns at the University of Wisconsin during the past year. Another useful article is that on the method of carrying out bearing tests for heavy foundation loads made under the direction of the architects, Messrs. Geo. B. Post & Sons, and the engineer, Mr. Amory Coffin, to ascertain the bearing power of the soil at the site of the new State Capitol at Madison, Wisconsin.

The *Architectural Record* has an illustrated account of that architectural nightmare, the New University Club in Chicago, a fifteen-storey, steel-framed, Perpendicular Gothic building, with internal Renaissance detail. The Exposition in Seattle is more satisfactory than many modern exhibitions, perhaps by virtue of the restraint imposed upon the designers by the lack of superabundance of funds. The house of Mr. Felix Peano, a sculptor who was his own architect, is strikingly peculiar, not to say eccentric. We hope Mr. Peano will not build another house, at any rate from his own design. The series of articles on "The Architect in History" now reaches the Dark Ages.

COMPETITION RESULTS.

THE Athy Urban District Council recently organised an open competition for the best plans of houses at 100*l*., 150*l*. and 200*l*. each under the Housing of the Working Classes Act. Mr. James F. Reade, A.M.I.C.E., has been awarded the premiums in the three classes.

The plans of Mr. G. H. Gadd, architect, of Bromsgrove, have been accepted for the new secondary school to be erected on the recreation ground, Bromsgrove. Six architects competed.

The plans of Mr. Herbert Norman, architect, of Northampton, have been accepted for the new Golf Club house at Harlestone, after a limited competition.

Messrs. Shayler & Swan, architects, of Shrewsbury and Birmingham, have had their designs selected for the proposed secondary schools for the Atcham Union. The assessor for the limited competition was Mr. H. T. Hare, F.R.I.B.A. In the course of his report Mr. Hare recommends that the number of architects invited in future should be at least twenty.

GENERAL.

Mr. John Archibald Campbell, F.R.I.B.A., died on Monday last after a few hours' illness in Edinburgh. Mr. Campbell was a Tite Prizeman, 1885, and a member of the Council of the Glasgow Institute of Architects. His work bore the impress of distinction, as, for instance, the offices of the Edinburgh Life Assurance Company in St. Vincent Street, Glasgow.

The Southampton Town Council have resolved to accept the offer of Mr. F. J. Burnett, offering to sell to the Corporation for the sum of 700*l*. Mr. Burrough Hill's collection of 228 oil paintings, water colours, pencil drawings, etchings and engravings of local subjects.

The Rector of Millbrook, Hants. (the Rev. G. G. Elton), has been asked to obtain the services of an architect and surveyor to report upon the condition of the church, and obtain a report of the estimated cost of the restoration.

Mr. Paul Waterhouse has been instructed by the North Riding Education Committee (subject to the approval of the County Council) to draw up conditions for competing architects to submit plans for the proposed High School for Girls at Saltburn, with accommodation for 120 girls.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, July 31.

Architectural Association Camera and Sketching Club Summer Continental Excursion: Caudebec and District, July 31 to August 7.

Manchester Society of Architects: Visit to Stokesay and Ludlow, July 31 to August 2.

Wednesday, August 4.

Town Planning and Housing Exhibition: Lectures on "A Practical Town," by Councillor J. S. Nettlefold, and "The Story of London," by Mr. S. K. Ratcliffe.

Saturday, August 7.

Institution of Municipal Engineers: Annual General Meeting at Durham.

Monday, August 9.

Architectural Association: Annual Excursion, Headquarters at Cheltenham, August 9 to 14.

Tuesday, August 10.

Sheffield Master Builders: Return Visit from the Belgian Builders, August 10 and 11.

EXHIBITION OF STUDENTS' WORK, ROYAL COLLEGE OF ART, SOUTH KENSINGTON.

NATURALLY, on visiting this annual exhibition, we turn our attention first to the Architectural School, not only because we are principally concerned with architecture, but because at the Royal College of Art architecture has first to be made a subject of study by all entrants to the schools before they are permitted to specialise in any other branch of art. In the arrangement of the drawings for exhibition the principle has been adopted of selecting a limited number of works and hanging these with an adequate amount of room, so that the visitor is not surfeited with the sight of a large number, and is able to properly examine and appreciate those that he is shown.

In the designs of the Architectural School at the Royal College of Art one is struck with the importance attached and the attention given to the completion of a design by the thorough working out of the interior, and particularly of colour schemes of decoration; indeed some students appear to devote more time to this part of the design of a building than to plan and composition, possibly by reason of the fact that their study in the Architectural School is, as we have already said, compulsory, although their sympathies may be inclined more to other forms of art expression than building.

The designs by senior students from the first division of the upper school may be taken as illustrative of the work of those who are specialising in architecture, that is who mean to be architects, and is represented by a selection of four designs for a college chapel, and one for the interior of a council chamber. The designs for the chapel are all good and thoroughly worked out, that of the winner of the travelling scholarship, Mr. C. P. WALGATE, being of excellent character, if perhaps somewhat over florid except in the vaulting, which we should rather have seen treated with liernes as more in keeping with the feeling generally of the design. The detail of the canopy work is exceedingly good in design and workmanlike in its draughtsmanship. There is no attempt here at prettiness or trickery in delineation. It is, indeed, a feature of the Architectural School of the Royal College of Art that thoroughness is a dominant characteristic of the students' work. In all the designs for the college chapel, one drawing in each set, evidently compulsory, is a full-size detail of carving, drawn in black and white chalk on brown paper, and the details generally are well worked out. The design of Mr. H. L. OAKLEY, who wins the 6*l.* prize, is of a rather more strictly collegiate type, or, if you like, archæologically correct rendering of Perpendicular work, with fan vaulting, but although simpler in treatment than that of the scholarship winner is also an excellent design, one might even say on occasion more suitable for execution. The remaining two designs, that by Mr. W. T. BENSLYN, who has previously taken a 6*l.* prize, and that by Mr. A. B. ALLEN are also very good; and, as a matter of fact, there is no great degree of superiority in the designs that have obtained rewards over those that have not been so fortunate. The level of achievement is throughout of a very high standard.

The design for the colour decoration of a council chamber, by which Mr. H. F. CASTLE wins a 3*l.* prize, is good, but might possibly be better, the scheme of colour being somewhat too vivacious for the purpose. This, however, is better than a muddy effect, which might easily have resulted from a student's attempt at maintaining a lower and more sonorous key. As no other competitor's work is exhibited there is no opportunity for comparison with other renderings of the subject.

The five students, of whose work we have already spoken, represent the first division of the upper school. As illustrative of the work of the second division of the upper school, we have seventeen different treatments of the same subject, a town mansion occupying one side of an open square. This, a purely academic problem, is by no means an easy one for medium grade students, to whom it must necessarily be somewhat difficult to think in capitals or in a sufficiently grand manner for the essentials of the subject. Therefore, it is not surprising that many of the students whose work is shown have failed to produce properly dignified plans, and several have not risen to the level of the occasion in their external treatment. The interior decorative design is, however, well tackled by most, even if some have displayed a tendency to regard a town mansion as a box to contain costly apartments or halls. The majority of the students must have devoted far more time and study to their internal decoration than to their plan or elevation, or to both combined.

Mr. T. H. HUGHES has a good design with an interesting and effective plan, and the exterior is also both dignified and well composed with a grand central arrangement of columns and pediment. A porte cochère has apparently been deemed essential by several students besides Mr. HUGHES, but such a feature in almost all cases detracts from the dignity of a grand mansion. In this case the author has, as a practical point, spoilt its usefulness as well as the effectiveness of his treatment of forecourt

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AT COMPTON WYNYATES, WARWICKSHIRE.—FROM A SKETCH BY BANISTER FLETCHER.

by adopting a wrong position for his carriage entrance, of which there should have been two, not one immediately facing the side of the porte cochère. Mr. H. RHODES has a plan which is lacking in architectural character and even in practical merit, although he has attempted by the arrangement of a circular hall to provide an occasion for a good piece of colour decoration. His exterior elevation, somewhat in the manner of KENT, is dignified if coldly and severely formal, but is relieved by some well-drawn figure sculpture. Mr. J. L. ROBINSON has produced a good design but illustrates it by only one elevation, thus avoiding what some of his fellow students have evidently felt not to be easy, the adequate rendering of the garden front. Mr. R. E. ROLLEY is represented by a design of some merit, whose details are better than the general scheme, the exterior in red brick and stone being somewhat lacking in dignity and not quite happy in proportion. His marble hall, although well enough *per se*, is scarcely in keeping with the feeling of the exterior, and can hardly be considered sufficient to turn a house into a mansion. Mr. W. M. KEESEY comes within measurable distance of evolving a good design, but his central feature both in front and back elevations is poor. Other designs not without merit are those of Mr. H. BROWNSWORD and Mr. J. F. GREENWOOD. There are two designs that are interesting because they reveal the fact that those we see exhibited are the work of their presumptive authors and not of the masters of the Architectural School. Mr. D. FRIEDLEY shows us an attempt to design a Gothic mansion, by the mixture of a rambling and involved plan with a curious jumble of motifs, principally German and Tudor, the whole adorned with eccentric quasi-mediæval lettering and verbiage. This gentleman has not yet comprehended architecture. The second youthfully original designer is Mr. F. GRISSELL, who has ignored the work of antiquity and produced a somewhat restless medley in red brick and white stone, which even the marble hall does not transform into a mansion. One is rather inclined to look askance on marble halls and imagine that they betoken a desire to attain luxurious decoration without great demands on the author's knowledge or powers of invention. Quite a mistaken idea, for though it is easy to specify the lining of walls with costly marbles, it is quite another thing to make a good design in marble, about the most difficult material it is possible for an artist to manipulate.

The examples of work by students in their first term or elementary course are excellent in their thoroughness, whether sketches of old work in the museum, studies of Classic and Mediæval detail, or designs based upon the work of antiquity.

The School of Sculpture and Modelling shows some admirable work, most of the examples like those in the Architectural School being parallel treatments of the same subject by various students. The travelling scholarship has been won by Mr. C. VYSE, with a "Design for a commemorative monument to a man of science (DARWIN), half size of execution. Subject: Time and Science Unveiling the Truth." Mr. G. LEDWARD, who has won the 6*l.* prize in a previous year, runs Mr. VYSE pretty close, but the latter's treatment, well composed, is the less conventional and more original. The 6*l.* prize for this year has been gained by Miss MAGGIE RICHARDSON with an admirable "Full-size study of a female figure from life," and the 3*l.* prize by Miss JESSIE LAWSON with a similar study. An interesting subject of which there are several renderings is a "Design for a panel over a door. Subject: Spring," with Mr. S. K. COPE's treatment of which we were particularly pleased.

Examples of the work of the etching and engraving class are shown in the same room with sculpture, and some beautiful prints show excellent results of the teaching in the school.

The School of Design exhibition is rather overloaded with numbers, and when in addition these comprise designs for varied applications, the result is somewhat bewildering to the visitor. Thus the winner of the

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travelling scholarship, Mr. F. MOORE GORDON, is represented by drawings for brocades, room decoration, tapestry, printed cottons, pottery panels, manuscripts, &c., stained glass, wallpaper, a fire dog, and a marble tomb. Most of this gentleman's work is excellent, as are also his studies from old work, but his design for the decoration of a dome is hardly a success, either in colour or composition, whilst in some cases we think his work is surpassed by his less fortunate competitors; for example, Mr. R. C. WEST, who gains the 3*l.* prize, has some designs for stained glass which are very good both in colour and composition. The 6*l.* prize is taken by Mr. A. W. BELLIS, and amongst the other students who, although not prize-winners, have nevertheless done good work, we note Mr. TATTERSALL and Mr. WORSLEY.

The Evening School for Anatomy and Drawing from Life shows some excellent results of the peculiar system of instruction adopted. The skeleton, fully articulated, is posed in the same attitude as the living model, so that the student may readily grasp the relation of the bony structure to the muscles by which it is covered. Very important, too, are the rapid half-hour studies from life and the fifteen-minute sketches from memory, so that from the point of view of the decorative draughtsman admirable results are achieved.

In the School of Painting and Mural Decoration the good result of the study of anatomy and life is to be seen. The subjects set are mainly treated as sketches for mural decoration, and these in the main, are superior to the finished studies; but Mr. P. H. JOWETT, the winner of the travelling scholarship, has a good design for "Decoration over fireplace of library—oak setting," and Mr. R. R. GILL, who wins a 6*l.* prize, a good colour scheme in his "Panel for entrance hall of hospital—white setting."

Altogether the students' work of the Royal College of Art marks a satisfactory level of achievement.

NOTES AND COMMENTS.

THE necessity for a very clear definition in building contracts of the position of sub-contractors or independent craftsmen is shown by the lengthy litigation between Messrs. JOHN TANNER & SONS, plastering contractors, of Liverpool, and Birkbeck Bank Chambers, Chancery Lane, and Mr. GEORGE PERCY BANKART, the well-known artist in decorative plaster. Messrs. TANNER were general contractors for plaster-work at the Victoria and Albert Museum, and Mr. BANKART was employed in certain decorative work. It was claimed by Messrs. TANNER that they suffered damage, and it appears to have been admitted that they had done so, by the length of time that they had to allow Mr. BANKART the use of their scaffolding. On Mr. BANKART's behalf it was urged that there was no unnecessary delay on his part, but that the nature and importance of the work required the repeated alteration and offering up of models before Sir ASTON WEBB was satisfied that his ideas were properly carried out. Messrs. TANNER were not without experience of elaborate plastering, having carried out the work at Stockport town hall, and might therefore be expected to be able to estimate how long the work done by Mr. BANKART would take. Thus there does not seem to have been any fault committed by anybody. The case was tried before Mr. MUIR MACKENZIE, the Official Referee, and he decided against Messrs. TANNER'S claim on Mr. BANKART.

ST. GREGORY'S CHURCH, Kirkdale, Yorks., now being restored under the direction of Mr. TEMPLE MOORE, is of more than ordinary interest, from the remains of Saxon work therein. An old sundial with an Anglo-Saxon inscription, said to be the longest one extant; a coffin-lid of ETHELWALD, King of Deira, and a supposed coffin of St. CHAD are relics of more than usual importance.

MEMORIALS of great artists are always worthy of recognition, and it is pleasant to hear that the site of the house in which J. M. W. TURNER spent part of his boyhood at Brentford has been ascertained, and is now covered by Northfleet House. The determination of the connection is due to Mr. F. A. TURNER, librarian at the Brentford Free Library.

THE monument of UTCHA-HERU-A, recently added to the exhibition of Egyptian relics in the British Museum, is of considerable importance from the decorative gold ornaments with which it is adorned, a rare thing to find by the time that such statues come into a European museum, for gold is easily looted and melted, and it is a far cry to the date when UTCHA-HERU-A lived—between 1100 and 1000 B.C.

MR. W. GOSCOMBE JOHN, R.A., has completed the great memorial on which he has been so long engaged, to the honour of the late ROBERT ARTHUR TALBOT GASCOYNE CECIL, third Marquess of SALISBURY, and it can now be seen in its place in Westminster Abbey. Mr. GOSCOMBE JOHN has united in his work with the memorial of the late Marquess a record of the CECILS and the part they have played in English history.

MR. REES, of Cardiff, architect, has been fortunate in his appeal against a judgment obtained against him by the Ham Hill and Doulting Stone Company, Ltd., for the price of stone supplied to a chapel of which he was the architect. Mr. REES lost his first case on the strength of a written correspondence, from which it was made out that he ordered the stone and there was a contract between him and the stone company. He won his appeal by being able to show that this written agreement was not the real agreement at all, but that the effective agreement was a verbal one made some days afterwards, when Mr. REES disclosed the principals for whom he was acting. This is the point of the whole case. An architect must be careful in giving orders to disclose that he is acting as agent and not as principal.

IT is a pleasing feature of the first anniversary of the young and flourishing Concrete Institute, which we report elsewhere, that the hosts of the Institute included in their invitation their technical and commercial rivals in the cement manufacturing trade. This is as it should be. Esprit de corps amongst the members of any profession, trade, or calling is, to put it on the lowest ground, profitable to all the members. Men should put a little more of the feeling of sport into their business affairs, do their level best to beat the other fellow, and be the first to cheer and congratulate him when he has licked them. Architects especially have not as a rule sufficient sportsmanlike feeling in their professional affairs. If they had, we should see less of the unseemly bickering that so often follows the decision of a competition. Not that protests against unfair play are unsportsmanlike, but too often the grumbling and ill-will is but the manifestation of disappointed self-conceit. For this reason we favour the development in the Architectural Association of the athletic clubs. The young architect who has surpassed his fellows in the cricket field, the running path, or the rifle range, is surely the less inclined to grudge the palm of victory to his conqueror in an open competition for professional employment.

ARCHITECTURE: ITS TRUE PRINCIPLES.—XV.

By R. OWEN ALLSOP.

DOMINATION AND SUBORDINATION.

WE have considered the subject of unity in massing and generally concluded that while that mass dominates which has the largest bulk, there are means whereby, by position, certain enhanced values can be given to parts of an architectural composition. In fig. 35 the subordinate additions about the lantern seem to enable this to hold its own against the sheer mass of the tower.

However diverse may be the purposes of a work of architecture, however broken up its component parts, it is

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nevertheless in purpose one thing in intention and to fulfil some main end. Hence the ultimate expression must have oneness. We have endeavoured to show how, if one feature be made plainly dominant (as, say, the lantern at Norwich) the dominating feature binds together the whole composition. It is not always possible in design to give the overlordship duly to that part which most merits the distinction; but unless we are to rest content with a kind of headless community, a variety of village, as distinct from a self-contained building, we must give the lead to some one feature or features. Common sense would seem to indicate that in a case like this, if what is the most important feature be so constituted as not to be effectually put into a position of true domination, the honour should, so to speak, go to the next in command, the next important feature.

In this case we can depend to some extent on increased work in any given part to give increased importance by attracting the eye to that point. This indeed is often the sole resource. In the case of street façades closely hemmed in either side, the whole of the composition consists in so cutting up and allowing the available superficies in this, which we may perhaps call two-dimension architecture—so that suitable architectural expression may be given. In such position a mere porch, large window, elaborate gable, or group of columns and pediment, may be frequently noticed as given the one dominant point in the scheme that the eye naturally demands, to save it from blank monotony and "over-all-alikeness." Many town sites, after allowing for practical considerations to be supplied, tax the resourcefulness of an architect to the utmost, and this is why, perhaps, the present run of street façades are not only not worth looking at, but positively repulsive. It is easy enough to produce fine effects in three-dimensioned architecture, but all praise is due to those who can so give the impression of beauty to a relatively flat façade that our attention is kindly arrested. The angle site gives more scope for treatment, and here the dominant angle turret or other treatment of the two meeting planes may form the keynote of the scheme. It requires wonderfully little to effect the object of providing one more prominent feature than another. We see many specimens of domestic architecture where the effect is



FIG. 35.—ELY.

lifted out of tameness and monotony by a small extra amount of thought or work bestowed on a bay window or windows, and fig. 36 may be instanced. It is a similar process to that of pictorial composition—the leading the eye to some central point of interest. It is clearly necessary to differentiate between this and the formation of a special point of interest and true dominating and subordinating of masses, and, further, between these and variety of treatment.

The right interpretation of the domination and subordination of mass is the giving to each its due weight and importance. This apparently simple affair necessitates in fact a nice sense of discrimination. We see the effect magnificently illustrated in the well-balanced cathedral, as we have endeavoured to show above. The success doubtless arises from the clearly perceived motive of emphasising the cross and the fact that the essence of the cross is the actual crossing and not the arms.

In default of some phonetic necessity for a supreme dominant object, or of the important member being, by its size or design, *ipso facto* the dominant object, we must needs fall back upon the more artificial method of architecturally creating a dominating mass. Manifestly the pro-



FIG. 36.—No. 17 FLEET STREET, LONDON.

ceeding is not so truly architectural. It becomes, however, an æsthetic necessity, if we are to avoid the tameness of monotony in mass. Monotonously equal values are to be avoided, either in weight of form or distribution of light and shade. We are only here following the well-understood laws of the artist and sculptor, and indeed of every kind of art. The point of special interest must be created; there must be variation in values, and there must be some law of variation either by contrast or by graduation. In composition—speaking of mass—it must be by varied "weight"; in an elevational class of design, such as city façades, the same must be apparent in what is, relatively, minor grouping.

It is interesting to inquire into the reason of this necessity. At first sight it might be thought that if a work of architecture is to have unity the first thing would be to give equal value to all parts—to equally and justly distribute thought and decoration so that there may (it might be argued) be a final oneness.

A great fundamental law of nature seems to be that there shall in nothing be equality. Equality and justness are not synonymous, since there may be justness without equality. At the outset then we are reasonable if we follow the dictates of nature and produce, or at least rest content with a state of unequal things. It is not necessary to give any further example than the stars with their sublimely varied distribution and brilliancy. Anything more horrible than the nightly reappearance of a geometrically regular pattern in the sky it would be difficult to conceive, unless it were a world laid out like a formal garden with absolutely symmetrical plant life, mathematically arranged with, also, all matter under the law of crystallisation. The

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law of nature is variation, and there can be no variation without inequality—perhaps, more correctly, the fullest possible scope for variation demands inequality in the units that are subject to variation.

We are justified so far in emphasising the unequal, and if we consider that the parts component of a work of architectural design evidently vary in merit, worthiness, or dignity we shall have no hesitation in admitting the justness of inequality. Not to recognise and express this inequality would be unnatural, and would lead to the neglect of simplicity and truth.

The subordination of parts entails law and expresses order, the essence of which is correlativeness. The parts of an architectural composition may be related, or bound together, either (1) by mathematical symmetry, (2) by the symmetry of nature, or (3) by balance. Domination by weight of mass is powerful, but more so is subordination by relative position. Thus, all parts of a symmetrically *planned* capital refer to the axis of the column; hence the axis dominates though invisible and imaginary. As a result the regular figure of geometry has unity by the relation of its components to a centre, plane, or axis, and represents order where the irregular and amorphous is but shapelessness torn at random from infinite space. Concentric circles refer to a centre point; by eccentric displacement we may enhance the importance of each circle at the sacrifice of unity. As a consequence, regular geometrical figures are more pleasing than irregular figures, unless the effect is modified by specific design. Deformed geometric forms—as a defective cube, dented sphere or imperfect cylinder—are universally felt to be offensive. Meaningless masses become the personification of ugliness when they partake of the nature of a distorted elemental figure of geometry.

The reason, so far as concerns architectural design, seems to be the insubordination of parts—lack of relatedness. Fortunately the square and true-edged board of the architect insures automatically, to a great extent, due observation of the fundamental law of well-building—perpendicularity, and its complement, horizontality; and that eye must be warped indeed that preferentially creates distorted and expressionless main masses—deformed geometric solids. The 45° square further induces correlative planning. Thus, subordination by position becomes second nature, and elemental planning a variety of mechanical kaleidoscopy—true to angle and true to centre, base, and axis.

But, whereas by position we may subordinate, so by position we may also aggrandise and exalt. The eccentric circle, and the subtle (recondite) angle—as contradistinguished from the simple angle, such as 45° or 90°—gives more importance to the eccentrically and asymmetrically placed object; and this may be beneficial, as when to the regularity of a vase is opposed the irregularity of grouped flowers—geometrical, to broken, form—the rigour of mathematics to a natural *abandon* of carnation lily, lily rose.

The centre must perforce dominate the wings. As a principle, *omne trinum perfectum* is good. It is but another expression for unity, since three-in-one is understood. By observance of the laws that insure unity in multiplicity we may best avoid, in architecture "double composition," in life an *impasse* on the horns of a dilemma, with all that may imply.

(*To be continued.*)

EXCAVATIONS AT MAHASNA.

IN connection with the Egypt Exploration Fund an exhibition of antiquities found by Professor Ed. Naville, D.C.L., &c., Mr. E. R. Ayrton, and Mr. L. Loat at Abydos and Mahasna was opened on July 8 at King's College, London, and will close on Saturday, the 31st inst.

Last week Mr. Edward R. Ayrton delivered a lecture in the Hall of King's College descriptive of the excavations carried out during the past season on a prehistoric cemetery dating from before 5000 B.C. In his opening remarks he described the site and the way to reach it. After leaving the steamer at Alexandria or Port Said, a short railway journey brings one to Cairo, where a day or two is usually spent in getting the necessary papers from the Government. A concession to excavate is only granted on the condition that careful notes are made and finally published, and that the Cairo Museum shall have a right to a certain proportion of the objects found. From Cairo a railway journey of some nine hours bring one to Baliana; from here the site is about eight miles distant, the ride being made on donkeys across cultivated land.

The archæologists for the Egypt Exploration Fund commenced excavations in November, 1908, on the ancient site of Abydos. After they had been at work a couple of months a friendly (though not disinterested) Arab brought news that a predynastic cemetery was being plundered by the natives at El Mahasna, which lies about seven miles to the north of Abydos. Although his tales as to the booty which the thieves were nightly digging up fired the party's imagination, they felt it would be safer to judge of the site for themselves before asking permission to work there. Accordingly the party rode northwards, with the Arab as guide.

Although as far as could be judged from a cursory glance the place had been badly plundered, they decided to ask the Government to allow the party to test the ground at any rate.

M. Maspero, the Director-General of Antiquities, at once sent the necessary permit. On the evening of January 1 the cavalcade of camels and men (not to mention a small pup travelling in a basket) left the mud-brick house where the party had been so comfortably installed and headed northwards along the edge of the cultivation. Soon after nightfall tents were pitched beside the new site. The village of El Mahasna is built on the edge of the desert; to the south runs a long cemetery, which was excavated by Professor Garstang in 1899; here he also found a large prehistoric settlement with which the cemetery excavated last year was no doubt connected. The camp consisted of a tent for the directors, a kitchen tent, and two larger tents for the twenty-five men. The shallowness of an average grave of the predynastic period, and the absence of any considerable amount of surface rubbish, rendered a larger staff of workmen unnecessary.

The graves covered an irregular oval of desert some 200 yards long from north to south and from east to west about 150. A fair estimate of the original number of graves would be about 600, and of these about one-half were opened by the representatives of the Egypt Exploration Fund. The remainder had been too obviously plundered to repay digging from any point of view.

The earlier burials lay to the south on the sloping bank of a broad "wadi," and had been more or less covered over by drift sand which protected them from plunderers. The other graves (forming the majority) were dug on the flat surface of the desert; these had suffered severely. In fact the cemetery had been plundered on no less than four occasions. The first digging had evidently taken place in quite early times, and the surface had regained its natural flatness and gave no sign of the grave below. Yet most of these graves were absolutely cleared out, and the party considered themselves lucky if a single vase was found intact. The second plundering was shown by the shallow hollows which had not yet filled up; the third was still more marked, while the fourth was barely a month old—the graves standing open. This last plundering had taken place in the southern part of the site and had just touched the outskirts of the oldest burials. It was here the richest graves were found.

The cemetery is of importance from the fact of its complete isolation, so much so that not a single instance of a later burial was found in its area. The graves ran from the earliest period to the single-chambered brick graves of the early first dynasty, which were found on the extreme north. The sole difficulty with which the party had to contend was the hurricanes which are of frequent occurrence during January. Indeed, it was necessary to stop work on one or two occasions, so impossible was it to keep the burials clean until they had been photographed and recorded.

The earliest graves in the cemetery were shallow hollows in the desert, in which the body, probably wrapped in a skin, was placed in the crouched position which is typical of all predynastic graves. The only object placed in the grave was a single vase of black-topped red pottery, of which very numerous examples have been placed on exhibition at King's College. During the next period the skeleton was wrapped in a mat, while the graves were oval in shape and deeper. Slate palettes of rhombic shape for grinding eye-paint were placed in some of the graves, and of these also a considerable number are exhibited. In

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one grave there were two black-topped vases, a large jar which contained grain, and a dish. Under it lay two ivory pendants and two slate palettes. Graves containing more than one body were the exception. In one such case the bodies were of a woman and a child in a large grave. Several vases of pottery stood at the head, and at the feet lay a clay gaming table with its pieces. Another body wore an ivory bracelet on each arm, ivory pendants beneath the left cheek, and a curious wooden figure lay on the body. All of these objects are exhibited at King's College. Some of the later graves of this period contained great quantities of pottery. In a typical instance a fine painted vase was placed near the face; fine vases were at the head and large rough jars (of which several contained grain) at the feet. Several burials of children were found—generally in rather large graves.

The next type of grave was oval, about six feet in depth, and was apparently roofed over. Laths were placed across the grave, on these were laid reeds, and on this again a plaster of mud. Some were about six feet in depth; those with a wooden lining come very late in the period and may even be of the first dynasty. The latest tombs in the cemetery belonged to the early first dynasty. They were lined with bricks, and a wooden lining either surrounds the whole of the burial or ceases at the larger vases. Only in a single instance did a pottery case enclose the body; this had neither top nor bottom, and, therefore, cannot be regarded as a true coffin. The pottery was placed outside.

It was in the earlier types of graves that the most valuable objects were found, the later graves being mostly filled with pottery. The grave that yielded the most valuable set of objects was that of two bodies, possibly a woman and a child, though the bones were too broken to yield any evidence. Before the face of the woman was a great mass of ivory bracelets. At the head were numbers of carnelian beads forming a necklace of about six hundred. A stone vase lay behind the body; two ivory vases were at the foot of the other skeleton. A comb and mud mace head were also found (the little ivory donkey being possibly off this latter), as well as ivory hair pains, the top of one of which has still an ostrich. At the end of the grave were several vases, two rhombic slate palettes and a group of ivory of great value. This latter was a long slim figure of a man with four wands pierced for suspension. At the head of the smaller skeleton were two or three ordinary vases and a very fine bowl with figures of hippopotami on the rim.

The gaming board found in another tomb is perhaps of most general interest. It is important to remember that the date is not later than 5000 B.C. The board was divided into eighteen squares; twelve pieces were found, two of which were larger than the others; it seems probable, therefore, that the centre row of squares was left blank at the beginning of the game and the men arranged with five small and one big piece on each side. It is not known how the game was played. From the same grave came seven hollow clay balls which rattle when shaken. These were evidently either cow bells or to wear round the waist.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE SUMMER EXAMINATIONS.

The Preliminary.

THE Preliminary Examination, qualifying for registration as Probationer, R.I.B.A., was held in London and the undermentioned provincial centres on June 14 and 15. Of the 178 candidates admitted, claims for exemption were allowed to the number of fifty-two. The remaining 126 candidates were examined, with the following results:—

District.	Number Examined.	Passed.	Relegated.
London	62	50	12
Bristol	9	6	3
Cardiff	9	7	2
Glasgow	8	7	1
Leeds	10	9	1
Liverpool	7	7	0
Manchester	14	11	3
Newcastle	7	7	0
	126	104	22

The passed and exempted candidates—numbering altogether 156—have been registered as Probationers, and are as follows:—

Aldous, C. F., Putney; Allen, G. A., Paddington; Allen, W. G., Bristol; Archbold, W. H., Yorkshire; Ashdown, A. J., Harrow-on-the-Hill; Atkinson, J., Lancashire; Bardens, S. H., Ipswich; Barrow, J. W., Morecambe; Baynes, E. S. A., Eccleston Square; Bennett, P. D., Birmingham; Bland, E. C., Northants; Booker, G. A., Sheffield; Booth, G. B., London; Bowmer, W. H., Oxford; Brewill, L. C., Notts; Brough, G. D., Balham; Brown, A. S., Slough; Brown, R. E., Dunedin; Bruce, J. C. C., Newcastle-on-Tyne; Brunelli, G. B. A. M., 2 New Square, Lincoln's Inn; Bush, D., Preston; Butcher, A. J., Weston-super-Mare; Butler, A. S. G., Kensington; Butler, W., Yorks; Cash, H. W., Harlesden; Cashmore, F. M., Hampstead; Catchpole, C. G., Ipswich; Chant, A. G., Lancaster; Clayton, C. L., Brighton; Cochrane, H. C., Dublin; Coldham, R. D., High Barnet; Copplestone, T. S., Exeter; Craske, C. W., Nottingham; Culverwell, W. L., Newport, Mon.; Day, M., Westbourne Park; Dodd, J., Newcastle-on-Tyne; Dodd, R. F., Isle of Man; Doherty, W. J., Londonderry; Edwards, E. H., Bradford, Yorks; Farmer, B., Siddington; Fausset, S. S., Belfast; Fenner, L., Hull; Fish, T. P., Bristol; Freaker, A. L., Clapham Common; Frear, E., Nottingham; Furner, A. S., Bristol; Gee, E., Liverpool; Goldschmidt, C., Withington; Gordon, D. J., Kent; Gray, J., Lanark, N.B.; Grellier, C., Epsom; Gunton, W. H., Blomfield Street; Hall, W. B., Folkestone; Harland, N. G., Lower Clapton; Harrington, C., Liverpool; Harris, M., Ealing; Hart, A. R. G., West Kensington; Hawes, F. L., St. Quintin Park; Higgott, S. B., Burton-on-Trent; Hoffmann, C., Bournemouth; Hofler, M. R., Pinner; Holaway, C. E., Chester; Holden, R. W., Lancashire; Holst, K., Basinghall Street; Holt, W. S., Middlesbrough; Hooper, E. L., Launceston; Hopewell, J. H., Eastbourne; Horsburgh, A. L., Streatham Hill; Howell, C. C., South Wales; Hudson, F. E., Streatham; Hughes, B., St. Swithin's Lane; Ingham, G. F., Elland; James, C. H., Gloucester; Jamieson, W. H., jun., Nottingham; Jay, E. P., Littlehampton; Jenkins, R. H., Hemel Hempsted; Jenkins, W. M., Port Talbot, Glam.; Jeune, B. H., Henley-on-Thames; John, D. H., Bridgend, Glam.; Johnson, A. G., Leytonstone; Johnson, R. S., Croydon; Johnson, T., Lancs; Jones, A. F., Salop; Jones, J. R., Penrith; Joslin, G. A., North Woolwich; Kessing, G. S., Melbourne, Victoria; Kitchener, A. J., Herts; Knights, R. E. V., North Kensington; Lait, L. H., Shepherd's Bush; Lambert, H., Surrey; Landy, H., Canonbury; Lawrence, J. H., near Neath; Lawton, W. V., York; Leigh, H. G., Clapham Park; Lemon, E. C., Southport; Lewis, R., Glam.; Lindsley, T. D., Wakefield, Yorks; Lowes, A. E., Newcastle-on-Tyne; Lutyens, E. J. T., Bedford; McCausland, C. J., Carshalton; Macgregor, J., Dunfermline; McLachlan, R., Lewisham; McLean, G., North Wales; Mant, F. G., New Square, Lincoln's Inn; Maxwell, H. P., Yorkshire; Maynard, F. J., Leytonstone; Mellows, J. S., Notts; Milburn, W. N., Carlisle; Millward, W. S., Cardiff; Mitchell, A., Scotland; Newton, W. G., Kensington; Nichols, C. E., Sheffield; Owen, G. B., Hampstead; Perrin, J. H. W., Reading; Pope, C. L., Southampton; Preston, E. C., Chester; Quarmby, G. F., Earl's Court; Ratcliff, F., Sheffield; Rayner, W. D. L., Chiswick; Reid, C. B., Vauxhall Bridge Road; Rhodes, H. G., Stockport; Rhys, H. L., Bridgend, Glam.; Ripley, C. G., Ipswich; Robertson, A. F., Perthshire; Robinson, P. G., Leeds; Ross, L. O., Belgrave Road; Scammell, E. W., Bristol; Seabrook, S. B., Ipswich; Shelmerdine, A. N., Liverpool; Shipley, R. R., Gateshead; Sibbitt, B., Liverpool; Silcock, A., Bath; Silcock, F. H., Bath; Smith, E. F., Walton-on-Thames; Smith, E. K., Muswell Hill; Soper, S. G., Brockley; Stephen, N. S., Chester; Taylor, W. A., Wandsworth Common; Teather, K. C. M., Cardiff; Tinker, R., Southport; Tolhurst, J. B. L., Beckenham, Kent; Tomlinson, L. D., Scarborough; Townsend, C. W., Staffs; Traylor, W. M., Newport, Mon.; Walton, N. A., Cheshire; Wardill, R. W., Chelmsford; Webber, W. K., Bournemouth; Whipp, J. R., Cheshire; Wills, T. L., Liverpool; Wilson, A., Fifeshire; Wilson, R., Falkirk; Winder, A. M., Oldham; Wooler, W., Manchester; Wray, E. J., Hertford; Young, C. J. M., Perth; Young, G. C., Perth.

The Intermediate Examination.

The Intermediate Examination, qualifying for registration as Student R.I.B.A., was held in London and at the undermentioned provincial centres on June 14, 15, 17, and 18, when 144 candidates were examined. The results are reported as follows:—

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District.	Number Examined.	Passed.	Relegated.
London	87	36	51
Bristol	5	3	2
Cardiff	4	0	4
Glasgow	4	3	1
Leeds	19	8	11
Manchester	15	10	5
Newcastle	10	5	5
	144	65	79

The successful candidates, who have been registered as Students R.I.B.A., are as follows, given in order of merit as placed by the Board of Examiners:—

Hadwen, N. W., Yorks; Lenton, F. J., Stamford, Lincs; Smith, W., Nottingham; Hill, J., Newcastle-upon-Tyne; Hughes, T. H., South Kensington; Leroy, A. D., Hackney; Williams, L. E., Surrey; Paterson, J. W., Edinburgh; Winch, A., Leeds; Fowler, C. R., East Finchley; Hedley, G. E., South Shields; Johnson, B., Plymouth, Devon; Sturgeon, R. V., Whalley Range, Manchester; Creed, R., jun., London; Howard, P., Ashton-under-Lyne; Lawson, W., Gateshead-upon-Tyne; Brodie, J., Old Bond Street; Barefoot, H. J. L., Balham; Chetwood, H. J., Essex; Hill, H. O. W., Cheshire; Kay, J. W., Fife; Clarke, J. M., Preston; Letheren, W. H., Hants; Pearse, G. E., Shepherd's Bush; Jelley, F. R., South Wales; Hunt, S. G. W., Brighton; Russell, R. T., 11 Gray's Inn Square; Dewhirst, R. H., Leeds; Nicholson, F. W., Liverpool; Fish, T. P., Bristol; Hill, C. B., Yorks; Owen, G. B., Hampstead; Rogers, M. S., Manchester; Jones, H., Manchester; Allen, N. A., Liverpool; Barnes, V. S., Kent; Blount, W. S., Shepherd's Bush; Bloxam, O. A., Basinghall Street; Box, C. W., Lincoln's Inn; Brown, A. W. G., Edinburgh; Brunati, L., Middlesex; Carter, W., Sunderland; Dalgleish, K., Fenchurch Street; Dann, W., Gravesend; Garbutt, W. T., Bradford; Gibson, E. H., Harrogate; Hebblethwaite, B. R., Beckenham; Hedley, G. M., Northumberland; Hilton, R. M., South Kensington; Hooper, C. O., Earl's Court; Horniman, J. H., Hastings; Hulbert, F. S., Belgrave Road; Jenner, T. G., Bath; Knowles, B., Bootle; Leahy, W. J., New Southgate; Leech, W. L. B., Ipswich; Lushby, A. M., Fareham; Peters, K., Putney; Ridley, B. W., Nottingham; Ridley, G. W., Nottingham; Shepherd, H. J., Sheffield; Stanley, J. W., Manchester; Sutton, C. A. L., Nottingham; Thompson, W. H., Windermere; Webster, F. P., Sheffield.

Exemptions from the Intermediate Examination.

The following candidates, who had attended the four-year course of the A.A. School of Architecture, were granted exemption from sitting for the Intermediate Examination, and have been registered as Students R.I.B.A.:—

Adams, M. S. R., Chiswick; Pocock, P. W., jun., Surrey; Troup, F. G., Ealing.

Final and Special.

The Final and Special Examinations, qualifying for candidature as Associate R.I.B.A., were held in London from June 24 to July 2. Of the 132 candidates examined, seventy-six passed, and fifty-six were relegated to their studies. The successful candidates are as follows:—

Adams, P. T., Chancery Lane; Anderson, H. C., Heywood, Lancs; Antcliffe, W. C. (Special Examination), Fulham; Bartholomew, B. V., Walthamstow; Bell, W., Dundee, N.B.; Binning, A., Blackheath; Boddington, H., jun., 32 Emperor's Gate; Boss, A. H., Victoria Park Gate; Brazier, F. H., Cheshire; Bristow, C., West Norwood; Brough, W. J., Finsbury Park; Caminesky, P., Maidenhead; Carnelley, H., Hampstead; Carus-Wilson, C. D., Sevenoaks, Kent; Cathcart, W. D'Arcy, Bayswater; Cockrill, G. S., Gorleston; Constantine, H. C., Gower Street; Cook, V. C., Wolverhampton; Corfield, C. R., Birmingham; Dahl, J. L. S., South Hampstead; Dickinson, W. F., Cambridge Street; Dod, E. J., Liverpool; Edwards, A. L., Wimbledon; Edwards, A. H., Leicester; Ferrier, J. S., Edinburgh; Fitzgerald, G. E., Bedford Park; Fleming, H. S., Erith; Geen, C. A. (Special Examination), Lewisham; Gutteridge, R. F., Southampton; Hagell, F. W., Whitehall Park; Harvey, D., Hull; Henderson, A. G., Glasgow; Hotz, R., Wandsworth Common; Jarvis, J. W., Harrow; Jenkinson, J. M., Sheffield; Kaula, W., Earl's Court Square; Kenchington, H. (Special Examination), Bedford Row; Ludlow, W. H., Clapham Common; Lusk, T. Y. (Special Examination), Shepherdess Walk; McLean, A. J. C., Brighton; Madeley, C. S., Birmingham; Mair, J. T. (Special Examination), New Zealand; Maxwell, F. J. M., Bedford Park; Mellor, W. L., Manchester; Metcalf, C. B., Bradford, Yorks; Mitchell, G. A. (Special Examination), Acton; Mole, H. W., Newcastle-on-Tyne; Morgan, E. E., Crouch End; Morris, H. S. (Special Examination), Eccleston Square; Nicholson, R. H. (Special Examination), Sunderland; Orr, R., Dorset; Petch, E. S., Scarborough; Pett, H. M., Brighton; Pierce, R., Addison Road North; Purchon, W. S., Sheffield; Rainforth, S. H., Ravenscourt Park; Rose, C. H., Wimbledon; Ross, H. A., Shepherd's Bush; Sawyer, H. S., Bromley, Kent; Seccombe, H. E., Weybridge; Seddon, J., Strand; Shapland, H. P., Canonbury Square; Simpson, C. H., Putney; Smith, F. R. (Special Examination), Acton Hill; Stewart, D. W., Tottenham; Tasker, W. W., Newcastle-on-Tyne; Turnbull, A., Sunderland; Unwin, H., Wigan; Vey, G., jun., Chiswick; Waller, H. (Special Examination), Gower Street; Warlow, H. G., Sheffield; Watt, J. D. D., Falkirk, N.B.; Williams, G. H., Windsor; Wills, J. B., Highbury Terrace; Wingrove, G. C., Newcastle-upon-Tyne; Young, J. G., Alloa, N.B.

The following table shows the number of failures among the fifty-six relegated candidates in each division of the Final Examination:—

I. Design	44
II. Principles of Architecture	50
III. Building Materials	16
IV. Principles of Hygiene	22
V. Specifications	25
VI. Construction, Foundations, &c.	40
VII. Construction, Iron and Steel, &c.	28

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 14, MR. REGINALD BLOMFIELD, M.A., A.R.A.' F.S.A., V.P.R.I.B.A.

MR. REGINALD BLOMFIELD is known not only for his excellent and scholarly architectural work, but as Professor of Architecture at the Royal Academy, and a charming writer. He has recently been elected vice-president of the Royal Institute of British Architects.

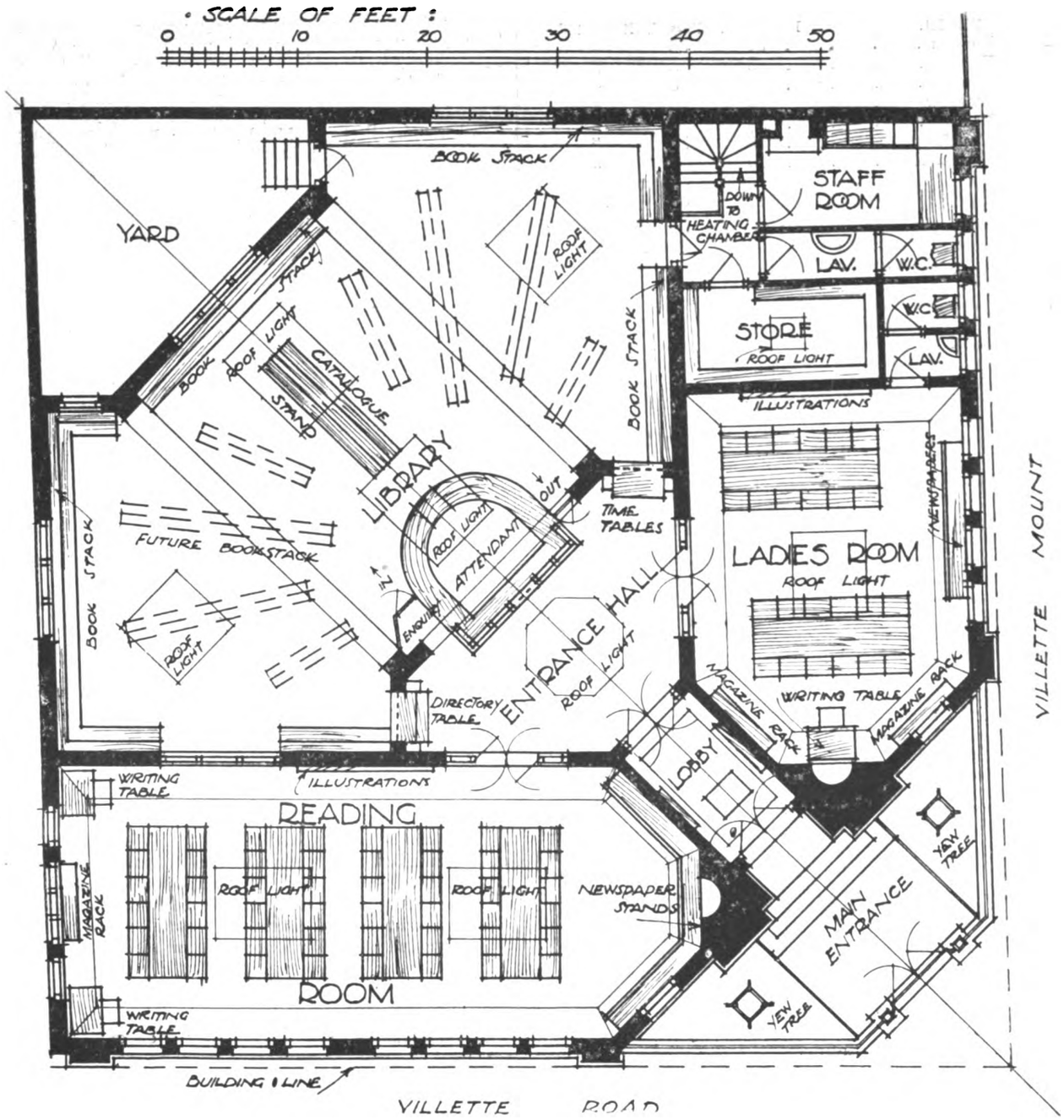
NO. 15, MR. PAUL WATERHOUSE, M.A., F.R.I.B.A.

IT is not always an advantage to have had a great man for one's father, but Mr. PAUL WATERHOUSE has made his mark independently, and in some of his recent work has evinced a scholarly and refined power of design that marks individuality. The best feature of Mr. WATERHOUSE's work is that it continually improves. We have intentionally linked in our series of cartoons Mr. REGINALD BLOMFIELD and Mr. PAUL WATERHOUSE as exponents of scholarly refinement in architecture.

BIRMINGHAM UNIVERSITY.—GENERAL VIEW FROM REAR—THE GREAT HALL—ENTRANCE HALL—INTERIOR OF GREAT HALL.

THE University of Birmingham sprang from Mason College, which was founded in 1870 by the late Sir JOSIAH MASON. Thirty years later it was absorbed into the newly-created University. In 1900 Messrs. ASTON WEBB & E. INGRESS BELL were instructed to prepare sketch plans of the new buildings. In February of the following year the Birmingham Architectural Association wrote to the authorities requesting that "having regard to the local interest and great importance of the new University to the Midlands, a competition among architects be arranged for the proposed new buildings on the lines of that conducted for the Victoria Law Courts, in which the sketch plans drawn up by Mr. WATERHOUSE were supplied to competitors, and that the sketch plans which we understand are being prepared by Messrs. WEBB & BELL should similarly form the basis of such competition." The Council replied that in their opinion the principle of selecting designs by competition could not be advantageously adopted in the case of the University. At the first annual meeting of the Governors in January 1901, when the appointment was formally made, it was announced that the donations promised amounted to about 410,000*l*., including the value of 25 acres of land given by Lord CALTHORPE. It was decided to erect in the first instance a University Hall (150 feet by 75 feet) and three departmental blocks for engineering and metallurgy, two on the west and one on the east side of the hall, the whole fronting to the arc of a semicircle with University Road as diameter, together with a power station. Since then

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GROUND PLAN OF LIBRARY, HENDON, SUNDERLAND.—EDWARD CRATNEY, Architect.

two further blocks have been undertaken, one at each end of the semicircle, as well as the Chamberlain clock tower 200 feet high.

The entrance hall is 50 feet square and 100 feet high. The floor is of Pentelikon and Sicilian marbles, and above is a circular gallery carried on marble columns. Overhead is the dome, 50 feet in diameter and 92 feet high from the pavement of the hall. Opening off the south end of the entrance hall is the great hall 150 feet long, 75 feet wide, and 65 feet to the crown of the semicircular plaster ceiling. This ceiling is enriched with the arms of the University by the Bromsgrove Guild. The walls are panelled in wainscot, and the gallery balustrade and the pilasters carrying the ceiling ribs are in buff terra-cotta. At the south end of the hall is the platform, with the usual retiring rooms on each side. Above each side of the platform may be seen the pipes of the organ made by Messrs. NORMAN & BEARD, Ltd., London, in the construction of which an extraordinary amount of care had to be taken. The general contractor was Mr. THOMAS ROWBOTHAM.

BRANCH LIBRARY, HENDON, SUNDERLAND.

THE building has been planned with a view to working the library with as small a staff as possible. The principal rooms are grouped round the entrance-hall, and consist of lending library, general reading-room and ladies'-room, with the usual complement of staff-rooms, stores, &c. The delivery counter is so placed that the librarian has direct supervision of each department. The library will be arranged on the "safe-guarded" open access system. The elevations are designed in a quiet treatment of Free Renaissance. The walls are faced with Ormesby brick and Windy Nook stone dressings, and the roof covered with blue Welsh slates. The floors of the main rooms are laid with maple wood blocks. The whole of the interior fittings are executed in oak. The building was designed by and carried out under the supervision of Mr. EDWARD CRATNEY, architect, of Messrs. DAVIDSON & CRATNEY, of Wallsend and Sunderland, whose design was selected in competition. The contractor was Mr. Jos. HUNTLEY, and the stonemasons MCMILLAN & SON, both of Sunderland. The carving was executed by Mr. CHRISTIAN NEUPER, of Newcastle. Messrs. EMLEY & SONS, Newcastle, were responsible for the heating and wrought-iron gates, and Messrs. SPITTAL & CLARK, Birmingham, for the electric-light fittings and ornamental metalwork. Messrs. ROBSON & SONS, Newcastle-on-Tyne, executed the delivery counter and screen, and Mr. F. COOKE was clerk of works. The whole of the fittings and fixtures have been designed by the architect and executed by the contractor.

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BIRMINGHAM UNIVERSITY: ENTRANCE HALL.

SIR ASTON WEBB, C.B., R.A. and E. INGRESS BELL, Architects

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BIRMINGHAM UNIVERSITY: GENERAL VIEW FROM REAR

SIR ASTON WEBB, C.B., R.A., and E. INGRESS BELL, Architects.

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BIRMINGHAM UNIVERSITY: GENERAL VIEW FROM REAR

LIBRARY OF THE UNIVERSITY OF CALIFORNIA

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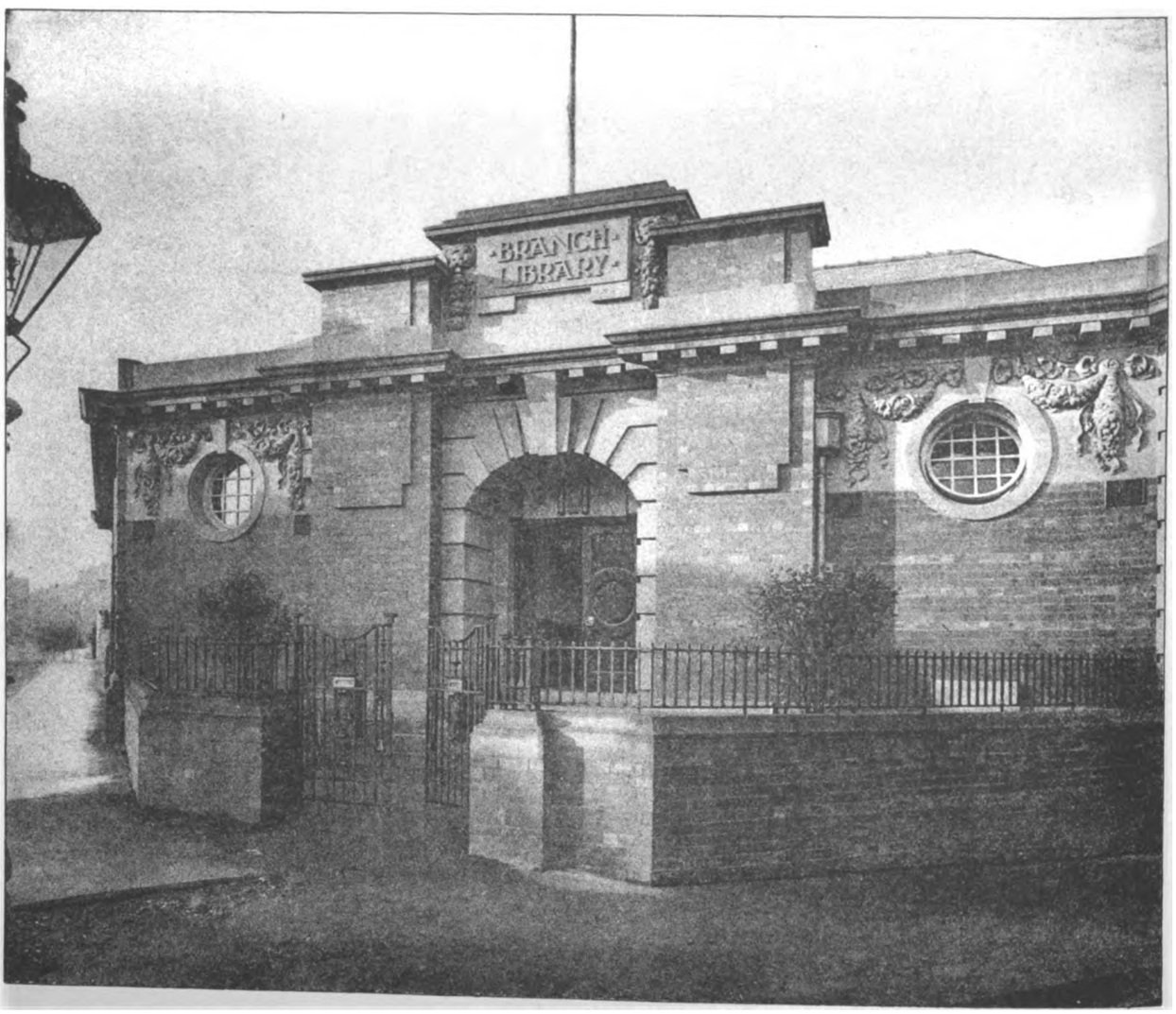
LIVING ARCHITECTS. No. 14: MR. REGINALD BLOMFIELD, M.A., A.R.A., F.S.A., V.P.R.I.B.A.

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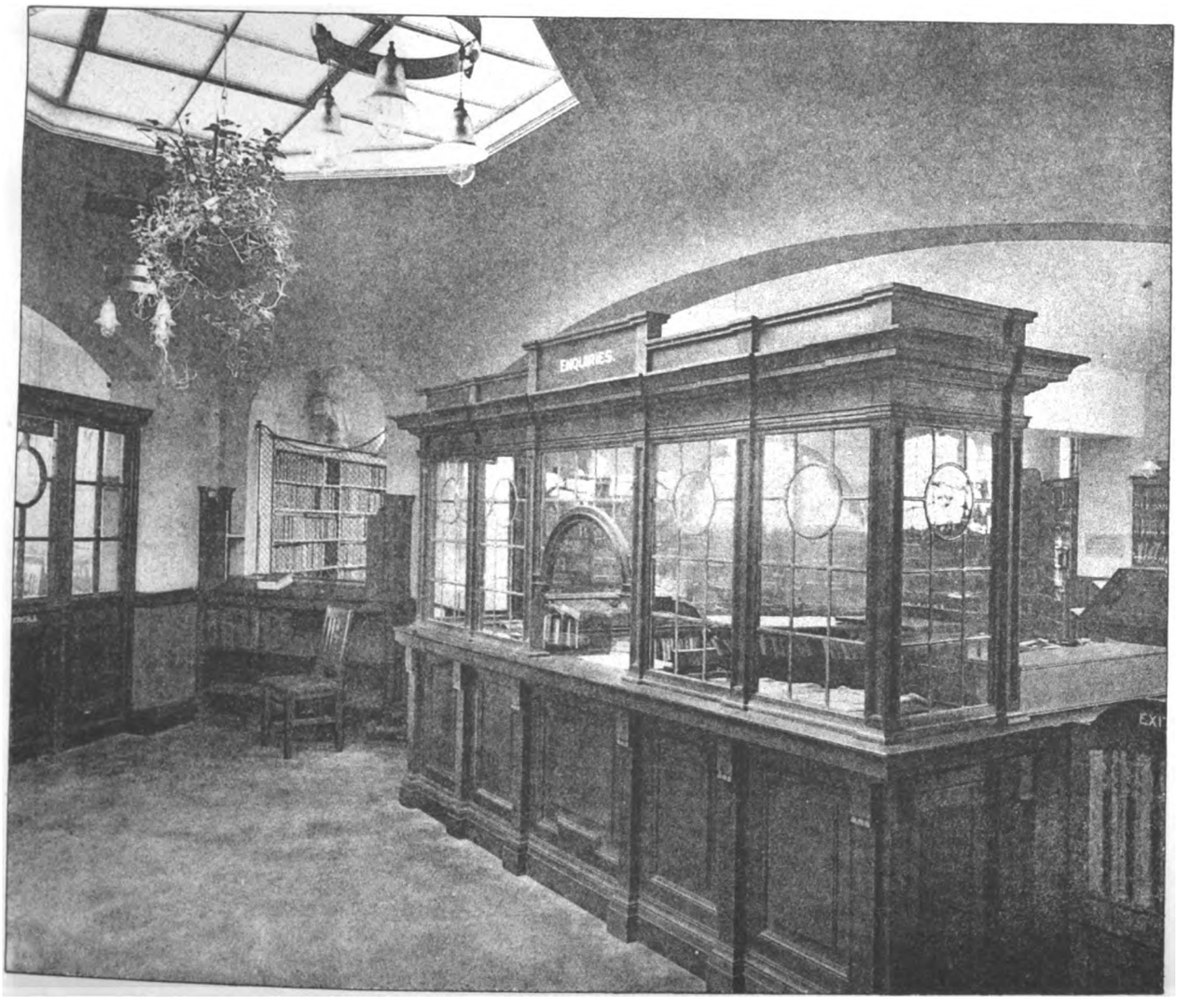




BRANCH LIBRARY. HENDO
EDWARD CRATNEY.

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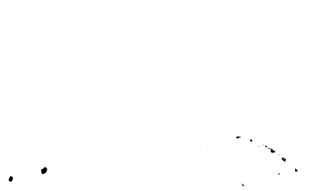


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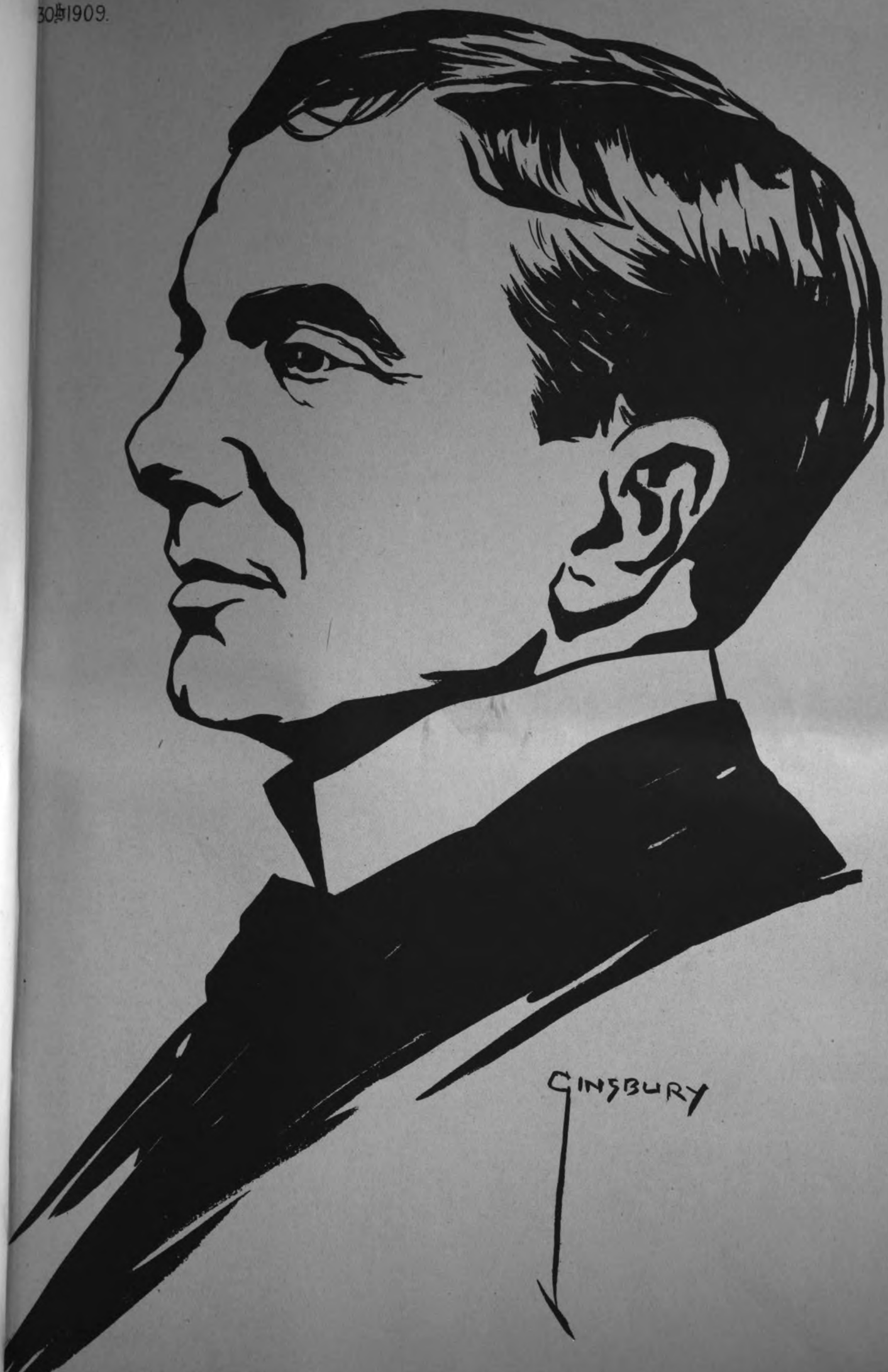
ENDON. SUNDERLAND.

NEY. Architect.

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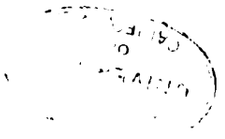


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LIVING ARCHITECTS. No. 15: MR. PAUL WATERHOUSE, M.A., F.R.I.B.A.

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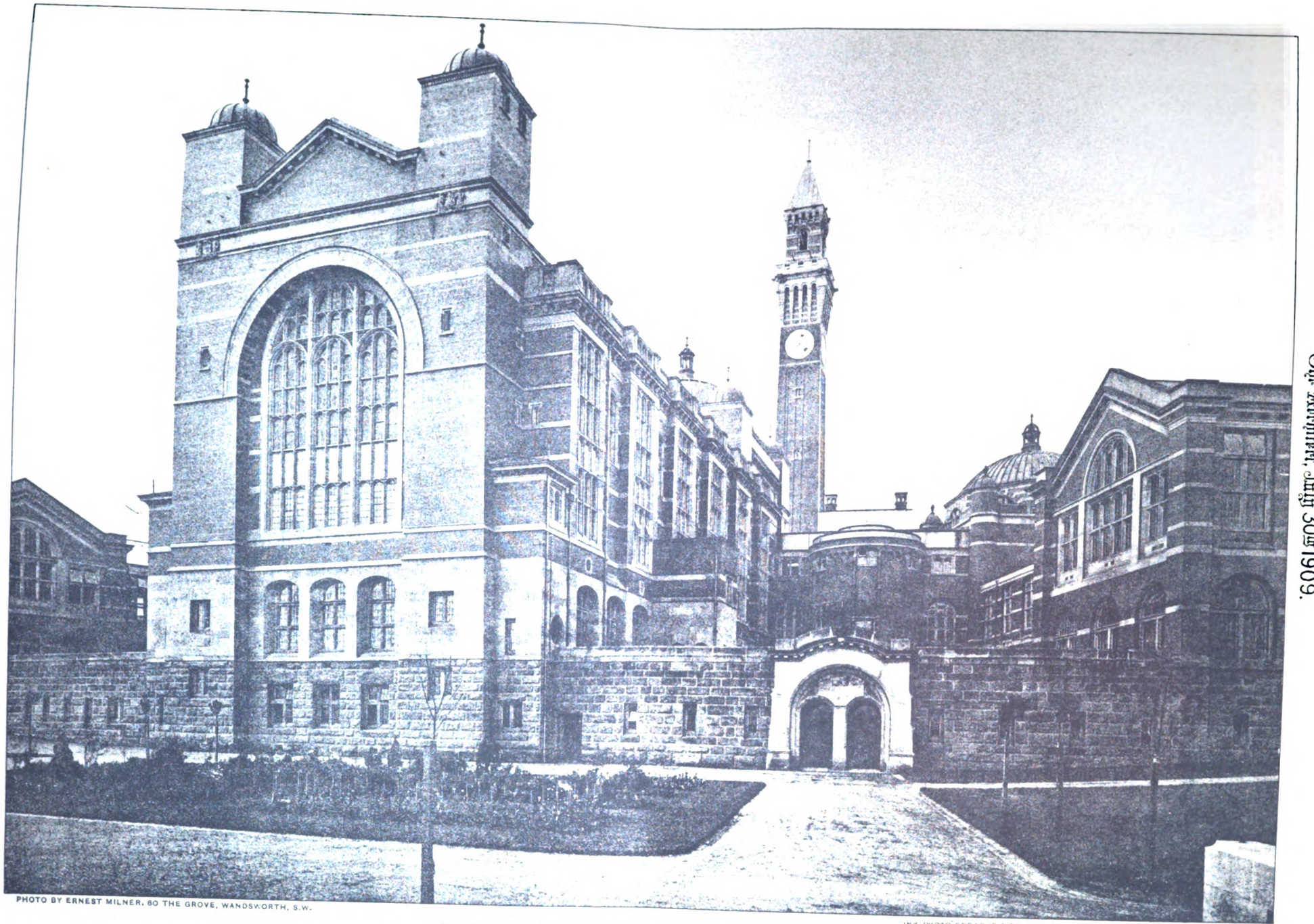


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BIRMINGHAM UNIVERSITY: THE GREAT HALL.

SIR ASTON WEBB, C.B., R.A., and E. INGRESS BELL, Architects.

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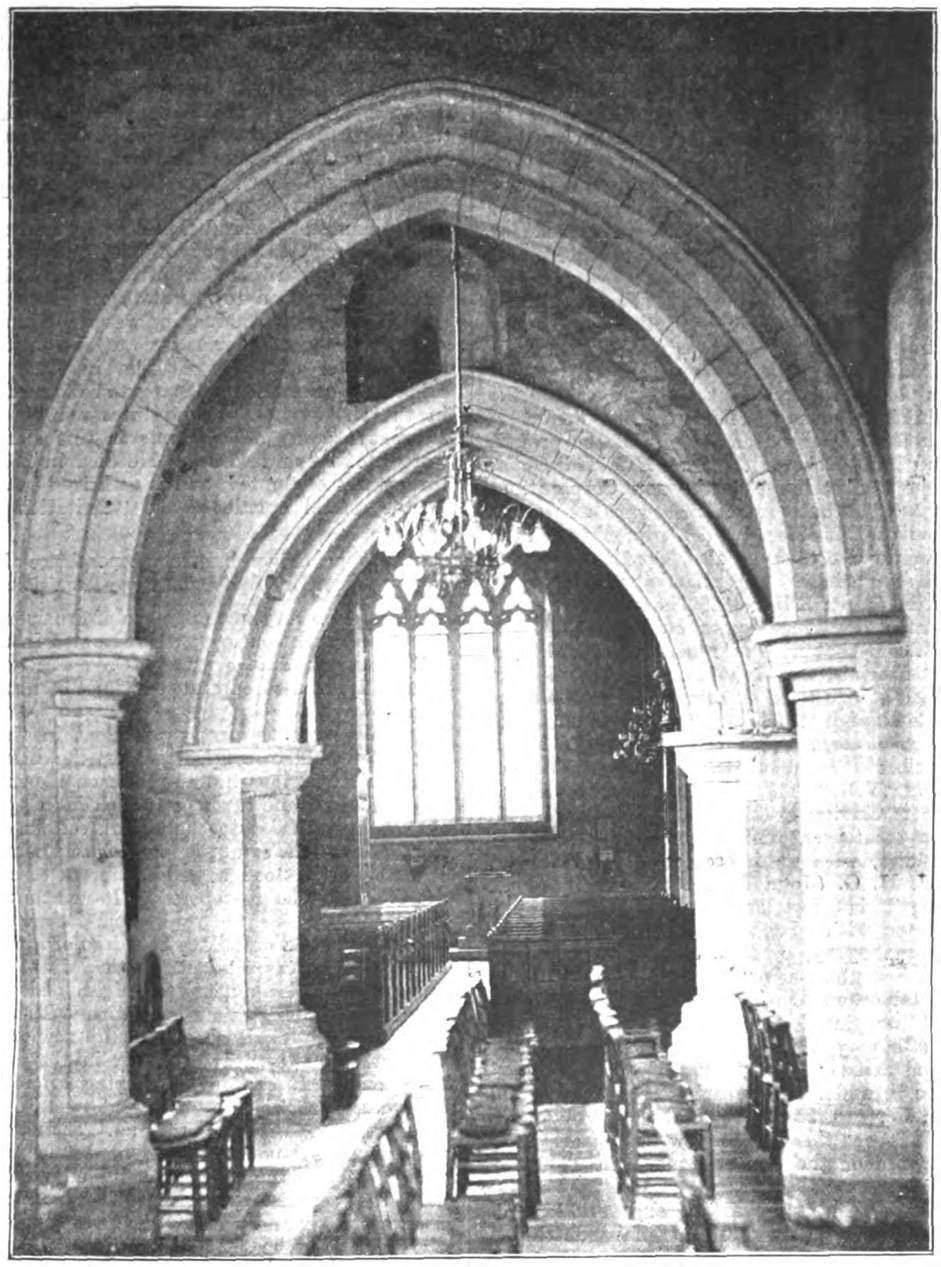
BIRMINGHAM UNIVERSITY: INTERIOR OF GREAT HALL.

SIR ASTON WEBB, C.B., R.A., and E. INGRESS BELL, Architects.

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INTERIOR OF THE CHURCH, GODALMING.

GODALMING.*

GODALMING is a town of high antiquity. It is mentioned in the will of Alfred the Great in the year A.D. 900; he gave it to his nephew Æthelwald, with the manor of Guildford and other property in Sussex. It is on record that the King of Denmark possesses two pennies of Ethelred that were coined at Godalming, and there is a street named Mint Street in the town at the present time. The principal industry was that of cloth-making. The former corporate seal of the town bore the device of a woolpack, and this has been perpetuated in the arms of the borough that were granted near the end of the nineteenth century. This trade once flourished, not only here, but at Guildford and Wonersh. It is said that weaving was carried on here as early as the reign of Richard II. (1377); the industry declined in the seventeenth century, and a petition was presented to Council dated November 26, 1630, by Philip West, John Perior, Joshua Perior, Lawrence Hackman, John Woods, Robert Chitty, Henry Chitty, Henry Monger, Nathaniel Webham, Timothy Chitty, and others; and these were described as clothiers of Godalming. After stating their grievances, the throwing of 1,400 poor people out of work, &c., they conclude by asking for an order for venting their cloths. This distress was brought about by their own careless trust in the stability of their contractor, Samuel Vassall, who being restrained of his liberty, and no other merchant coming forward to take it up, they were utterly disabled. On December 30 they presented a second petition "of distressed clothiers of Godalming and Wonersh to the Justices of Peace of County Surrey." According to Sir William Elyott the poor people of Godalming and Wonersh alone, who depended on the clothiers, amounted to 1,100, besides others in neighbouring parishes who numbered 3,000. Aubrey in his comment on this distress says:—"The decay, and indeed ruin of the trade, was their avaricious method of stretching their cloth from 18 yards to 22 or 23 yards, which being discovered abroad, they returned the commodity on their hands, and it would sell at no market."

Since the "decay of the blews" trade has opened up in other directions, such as the manufacture of stockings by framework knitters, of whom there were a large number in the eighteenth century. Bargate stone is now obtained locally in large quantities, and is used extensively in the erection of churches and other buildings.

According to the Report of 1835 on Municipal Corporations, the borough claimed to have a charter of 28 Edward I., but none of the inhabitants had ever seen it, and no allusion to it could be traced in any existing documents. There seems to be no doubt that this charter is the one that was granted on June 7, 1300, to Simon Bishop of Salisbury. This conferred a market at his manor of Godalming on Monday in each week, and a yearly fair on the vigil, the feast and the morrow of SS. Peter and Paul. Under the Bishops of Salisbury the inhabitants were exempt

* Read at a meeting of the Upper Norwood Athenæum by Mr. T. C. Thatcher.

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from toll on their goods and merchandise throughout the kingdom, freedom from service at the shire and hundred courts other than their own, and the right that, subject to certain exceptions, writs should be served on them by their own bailiff; the king's servants had no right of entry into the liberty of the manor or hundred.

The precise limit of the market town is not known, but there must have been some recognised area, as fines were inflicted for carrying on manufactures outside the town. There is a notable instance of this in the persons named Glover, who in 1440, 1441, 1452 and 1483 were fined for carrying on their trade of whitening leather outside the market town.

It is curious to note that on the east side of Church Street there was a house named Glovers; this was in the manor of the Rectory of Godalming, which was distinct from that of the town, and belonged to the Dean and Chapter of Salisbury. It is possible, therefore, that being outside the town, it did not enjoy the same privileges as those inside.

The old Hundred House stood on the site of the present market house, and it is probable that the Hundred House was adopted as the market house of the new Corporation. The present town hall was built in 1814.

Mr. Ralph Nevill in his able work deals largely with the charters; and I would like to do so also, but time does not permit. To put it briefly, the charter was granted January 25, 1575, by Queen Elizabeth. The next muniment in date was granted by King James on May 30, 1620. Clause 26 lays it down that no "inkeeper, alehouse keeper or tipler" shall entertain any inhabitant for more than half an hour either at one time or altogether on the same day, and fixes nine at night as closing time.

The town still possesses a copper toll dish shaped like a pipkin, and inscribed "Tolldish 1800," and also a constable's staff marked "V.R." There are also two large staves; the larger, which is carried by the bailiff, is painted all over, and has an escutcheon with the arms of England, Ireland and Scotland, with an in-escutcheon of Hanover, and the initials J. H. G. (John Hall Grinham, Warden), and the date 1810. It is 6 feet long, and tapers from 1½ to 1¼ inches in diameter, with a large gilt knob. The smaller, dated 1859, is of mahogany, or some similar wood, 4 feet 10 inches long, with a plain silver head 2½ inches long, an inscription in capital letters "Ex dono thome Cowper, gent.," and on the top, "Guardian-de-Godalmyng 1589"—this was used doubtless by the mayor.

The warden and assistants were superseded by a mayor, aldermen and council, under the Municipal Corporation Act of 5 & 6 William IV. cap. 26 (1835), and the borough was extended in 1892. It was then that a new coat of arms was granted, and the use of the old seal made in 1749 discontinued.

We will now leave the dusty charters, and turn towards the lighter side; and though I can only touch upon this, I would strongly advise any here present to read Miss Gertrude Jekyll's book "Old West Surrey," and also Thompson's "Picturesque Surrey." To begin with, it was in the King's Arms Inn that Peter the Great and his suite lodged in the year 1698. The bill of fare for this party, twenty-one in number, was pretty considerable; for instance, they had for their breakfast half a sheep, a quarter of lamb, ten pullets, twelve chickens, three quarts of brandy, sixty-nine quarts of mulled wine, and seven dozen eggs, with salad in proportion; their dinner, three stone weight of ribs of beef, a fat sheep, a lamb, two loins of veal, eight capons, ten rabbits, three dozen of sack, and a dozen of Bordeaux. In the year 1814 the Allied Sovereigns and their suites were entertained in this place, on the occasion of the overthrow of Napoleon.

The title of the inn is reminiscent of Charles II.'s visits to his hunting lodge, which is said to have been a timbered house, but now pulled down, and stood in Bridge Street. It is here also that the coaches conveying convicts would be driven into the yard, the gates would be closed, and the armed guards would let their charges out for a short rest and some food. These unfortunates were to be transported, Portsmouth being the port of embarkation. Again, it was no uncommon thing to see a coachload of sixteen jolly sailors, four inside and twelve outside, just paid off from some man-of-war, who had been from three to four years at sea, on their way to London town to spend their money—which they soon did. They carried a good store of liquor to keep up their spirits on the long journey. Such loads of seafaring men sometimes proved a danger to the coaches. They were so much accustomed to being swung about at sea, that when the coach lurched and swayed on a bad bit of road, or downhill, they let themselves go and swayed with it, instead of poising the body to counteract the movement of the coach, and the consequence was that several of the coaches were overturned.

Westbrook House, now a "Home of Comfort" for epileptic women, was originally the old manor house, long the property of the Oglethorpes, who settled here from Yorkshire in the seventeenth century. But previous to this it was owned by Nathaniel Godbold of the "Vegetable Balsam" epitaph which is to be seen on the wall of the south chancel. General Oglethorpe was born in 1698. The death through small-pox of one of his acquaintances, by name Castell, whilst in prison at the Fleet, drew the general's attention to the state of this place, and also to the Marshalsea. An inquiry was made, and the result was so horrible that reforms were at once instituted. He also founded the colony of Georgia in 1733, the last of the original thirteen United States to be formed; and one clause in the charter reads "no slaves were to be introduced." There are many other points in this man's life that are worthy of being recorded. He died in 1785. His philanthropy was celebrated, and is enshrined in a famous couplet in the second epistle of the "Imitation of Horace," by Pope:—

> "One, driven by strong benevolence of soul,
> Shall fly like Oglethorpe from pole to pole."

There is a very fine specimen of ornamental brickwork of the seventeenth century; it is situated in the High Street, and bears the date of 1663. On making inquiries of the tenants I was assured that it had not been materially altered in any way.

Smuggling was pretty prevalent in these parts. The "stuff" would be carried up from the coast by pack-horses, and left in various hiding-places on the road; but, should any villager come across any such hiding-place, he was by old custom allowed to chalk-mark certain of the goods for his own use—the smugglers leaving such marked goods alone, it being understood as a bargain, in consideration of the discovery not being reported. It was no uncommon thing in those days for the squire and farmer to wink at this traffic, to find a small keg of spirits or a parcel of lace left at their doors, as a return for the loan of the horses taken from the stables during the night, and even the parson was not exempt from such attentions. There is a good story told by Miss Jekyll about a squire new to the country—it was in the hills near Dorking, in the early part of the nineteenth century. One morning before he was dressed his valet brought him an urgent message from the bailiff to say that he wished to see him. The master said he must wait, as he was not dressed. The message was sent up again still more pressingly worded. "Well, send the fellow up," said the astonished squire. The man came in with a mysterious air and watched the servant out of the room, and then said in a hoarse half-whisper, "There was a run last night, sir, and I've marked four." The squire had no idea of what the information meant, and on being enlightened burst out indignantly, "But I can't have anything to do with smuggled goods; why, I'm a magistrate. How dare you come to me with such a suggestion?" The bailiff stood his ground and said, "If you'll take my word for it, sir, if you don't do as others do you'll have trouble." The squire continued to protest; the bailiff said, "Well, sir, will you ask the parson?" He did so, and the rector's answer was, "If you wish to live in peace with your neighbours you had better fall in with the custom of the country."

Godalming, like all other places, has its own folk lore and traditions, and it is supposed to be very partial to cats, if we are to accept the following lines:—

> Godalming for cats;
> Guildford for bulls;
> Chiddingfold for drunkards;
> Haslemere for fools.

The favourite device here for the token is a "malt-shovel."

Godalming Church is dedicated in honour of St. Peter and St. Paul. Mr. Prescott Row, in his very interesting work on Godalming (Homeland Series) refers the reader to a monograph by Mr. S. Welman, a local antiquary and architect. He then states:—"A special feature is the series of conjectural restorations of the church, as there is reason to believe that it existed during successive epochs—the Saxon church of the early part of the eleventh century, the Norman church at the time of Flambard, the Early English church of the thirteenth century, the Decorated church of the fourteenth century, the Perpendicular church of the fifteenth

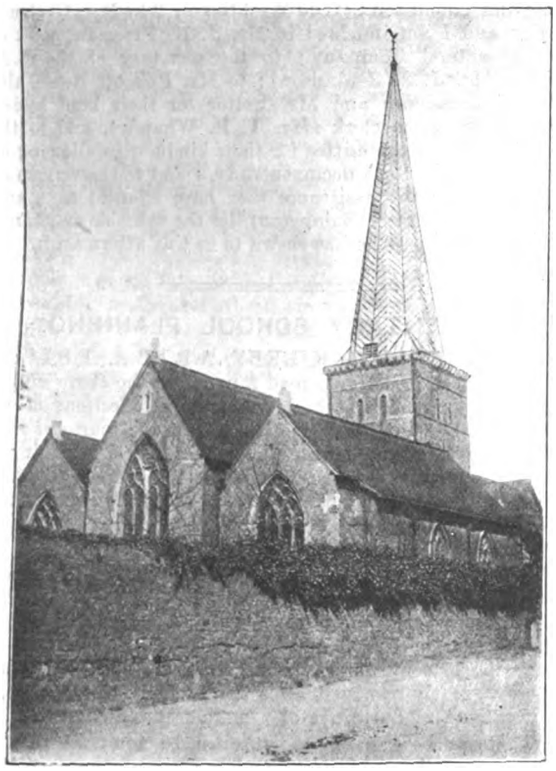
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and sixteenth centuries, and the 'churchwardenised' church, this latter from actual old prints, of the eighteenth century and the beginning of the nineteenth."

The Saxon church was a very humble structure, consisting of aisleless nave and chancel. To find out the parts belonging to this church, you must go up into the roof space of the nave, where they are hidden away. Yet it is stated that the whole lower storey of what is now the central tower, and probably the more easterly part of the nave, still enshrines the actual masonry constructed by our Saxon ancestors.

Norman church, twelfth century. The original nave was apparently left untouched, but a new Norman tower—sturdy and squat—was raised on the actual wall of the old Saxon chancel. At the same time a new chancel was built to the east, to meet the growing needs of the church, and also to give the Norman priest more room for his more ornate ceremony. Traces of its original round-headed windows were discovered during a repair to the chancel in 1867, and more fully laid open in a restoration of 1879. These have been carefully preserved, but unfortunately the fine old Saxon arch which for over 800 years had separated the tower from the nave was destroyed in the restoration; this so-called restoration has much to answer for. North and south transepts were afterwards added at a later period, either by Flambard or one of his successors, and the Norman church was complete.

In the thirteenth century chantries were added on either side of the chancel, and the nave was enlarged by the addition of aisles; at the same time the tower was raised by a storey, and was probably crowned by a spire.



THE CHURCH, GODALMING.

It was in the fourteenth century that the spire was built of timber covered with ornamental lead work, and it is without parallel in Surrey. It is said that these were common after the middle of the thirteenth century, but have mostly disappeared. Mr. Welman gives a very good reason for their disappearance. "We shall want some lead," writes the Lord General to his cornet; "the steeples have plenty."

In the fifteenth and sixteenth century epoch the nave and its arches were extended a single bay to the west; new roofs and ceilings were inserted, and the windows were enlarged and remodelled.

The Churchwarden period (seventeenth and eighteenth century). This was a glorious time for them, and was typical of the usual monstrosities—the erection of galleries and square box pews (where the said wardens could go comfortably to sleep), the panelling over of walls, and the boarding of roofs.

The church has undergone two restorations—in 1840 when the nave was lengthened, and in 1879, during the incumbency of the Hon. and Rev. Canon Broderick, at the hands of the late Sir Gilbert Scott, assisted by the advice of Mr. Ralph Nevill, of the Surrey Archæological Society. The restoration of 1840 was one of blunders, and the destruction about ten years later of the ancient sanctus bell, which used to hang under a little canopy outside the spire at the south-east angle of its base, was worse, and whatever the authorities were about to allow this I cannot conceive. The work of 1879 was largely the undoing of that of 1840, and a rebuilding still larger of the north and south aisles, with an extension of the north transept. In carrying out this work, the old Saxon arch at the eastern end of the nave was removed, and the new Early English arch, now to be seen, was inserted. The old Norman arch on the east side of the tower was also altered, being raised several feet, and the question arises, could not the Saxon arch have been dealt with in a similar manner?

In 1840 the sounding-board of the pulpit was done away with, but part of the canopy has been replaced in the north aisle of the chancel. In 1879 also disappeared a beautiful piece of carving—a canopied head supported by caryatides—which had been used as the pulpit door since 1840, and possibly before these alterations had formed the support to the sounding-board.

There are one or two monuments of interest. In the south-east corner of the south chancel chapel is a Decorated or Perpendicular altar-tomb, but this bears neither heraldry nor inscription. This is most probably that of John Westbrooke (d. 1503 or 1513) and Elizabeth his wife, mentioned by Manning and Bray, but in that case it has been removed from the other side of the chapel. In the wall above are four recesses, one of which shows traces of a broken piscina. On the floor of the chancel are three or four brasses. One of these, a small figure of a man in plate-armour, commemorates John Barker (d. 1595). Another is a man in civilian costume, with a woman in the "kennel" head-dress that was common in the first half of the sixteenth century. This is to Thomas Purvoche (d. 1509) and his wife Johanna. The brass inscriptions are worthy of attention—Mary Elliott (Barker) (d. 1600). Walter Underhill (d. 1679), "citizen and fishmonger of London"; and one with a coat of arms in memory of John Warner (d. 1757), formerly rector of Peper Harrow.

The registers date from January 8, 1540, but the earliest portion is lost. The first baptismal entry is 1582; marriage, May 5, 1583; burial 1583. On March 28, 1614, this entry appears, "Was buried ould Gooddy Peto, the widdo of J. Peto." In 1666, the year of the great plague, about thirty-four people are entered as dying of the plague; some are said to be "burried in ye garden." Commencing with Ulmer and including the present one, there have been forty-eight vicars. The mural painting is supposed to represent St. John the Baptist.

In a field about a mile to the south-west from the town, and near the hamlet of Tuesley, which was called the "minster" field, but locally known as the stone pits, was discovered about thirty years ago the foundations of a small church and also some skeletons. A cross set up in the field now marks the spot. This undoubtedly was the Saxon church, and Mr. Welman in his able monograph goes into full details, giving an extract from the register of St. Osmund relating to a visitation made to Godalming by Dean Wanda in 1220 as his authority.

I only intend to mention a few of the vicars of Godalming Church. The first that there is any mention of is Ulmer, a Saxon, in the time of Edward the Confessor. He was followed by Ranulf Flambard, the first Norman vicar, and from all accounts he was a very famous man, and must have been possessed of remarkable vigour and ability. Nicholas Andrews, D.D., instituted 1635, ejected 1643. This vicar came in severe collision with his parishioners, who petitioned Parliament against being compelled to bear with him any longer. They accused him of "being a haunter and frequenter of tiplings in innes and tavernes, and useth gamcinge (whatever that is) both at cards and table, as well uppon the Lord's dayes as others." And finally John Morgan and John Tichborne alleged "that the said vicar and Mr. Wayferar, parson of Compton, roade to Southampton [in another account it is Portsmouth, which is the more likely place], to eate fishe and to make merrie togeather, and there (dyverse tymes) drank healthes to the Pope, calling him that honest olde man." These are only two counts in the indictment; there were several others.

The next vicar was cited before the Parliamentary Committee on March 10, 1645, to show cause "why he pay not

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ye ffift part of tithe to the wife of Dr. Andrews," and again cited on May 7 following.

After the restoration of Charles II. was the Reverend Samuel Speed; he was grandson of John Speed, who made the maps. He was chaplain of the fleet under the Earl of Ossory, and present at some engagements with the Dutch. He is said to have shown great courage, and Sir John Birkenhead immortalised him in a ballad on the fight:—

"His chaplain he plyed his wonted work,
He prayed like a Christian, and fought like a Turk,
Crying now for the King, and the Duke of York,
With a thump, a thump, thump!"

He was instituted in 1662; died January 22, 1681-2.

The last one to be mentioned, Owen Manning, B.D., instituted December 22, 1763, died September 9, 1801. He was the originator and part author of the history of this county, which was finished at Shere by William Bray. At the age of seventy-five he became blind from his studies and lived for five more years. There is a curious story that he was nearly buried when he was a boy; he had had the small-pox and was actually laid out for dead. His father went in to see him; he raised him in his arms, saying, "I will give my dear boy another chance," and was astonished to see returning signs of life. He desired that no monument should be raised to his memory, but his friends could not be content to comply with his wish, and as you have seen this afternoon, there is a tablet of white marble in the north chapel, enumerating his virtues.

Wyatt's Almshouses.—These are situated at Meadrow, about half a mile on the road to Guildford from the East Bridge, or Bishop's Bridge; they were erected and endowed under the will of Mr. Richard Wyatt, dated 1618, upon part of the Pris marsh. They afford a comfortable asylum for ten poor men, each of whom has two rooms, and is allowed a small weekly sum in addition to certain annual gratuities. The building is a plain one of brick, with the chapel in the centre, and it has a large garden at the back. Miss Jekyll,



WYATT'S ALMSHOUSES, FARNCOMBE.

in her very instructive work called "Old West Surrey," says, "The excellent architecture of the early seventeenth century is well shown by Wyatt's almshouses." With regard to the chapel, I was told by one of the inmates that the present ceiling hid some very fine oak beams, and that there was a talk of its being removed to show these timbers, and I hope this will soon be carried out. The yearly income of the charity, derived from 146 acres, 2 roods, 28 perches of land and 691*l.* vested in Consols, amounts to 182*l.*, and its management is vested in the master and wardens of the Carpenters' Company, as originally stipulated by the founder.

You will recollect, gentlemen, that we visited this Company, under the able guidance of Mr. F. Higgs, on March 20 this year.

The inscription over the entrance stands as he made it:—

"This Oyspitall was given by Mr. Richard Wyatt, of London, Esq., for tenn poore men wth sueficient lands to it for yier mayntenance for ever, 1622."

By the courtesy of Mr. Freeman, clerk to the Carpenters' Company, I have been allowed to see a book written by E. B. Jupp, Esq., F.S.A., clerk of the Company, entitled "Genealogical Memoranda Relating to Richard Wyatt, &c." The will of Richard Wyatt is given in full; and in relation to the almshouses, after several bequests, goes on to say:—"Item, my will is that my executors shall gett Lycence to builde Tenne Almshouses for Tenne poore to dwell in to be sett vp in some convenient place neare Godallmine vpon some pte of Prismarch ffor the buildings of them with a convenient place to saye prayers in every daie I give ffive hundred pounds.—And my will is that none of these tenne soe to be placed shalbe eyther drunkard, swearer, or blasphemer of God, but shall observe such orders as shalbe appointed by the orderers of the Hospitall, or else put out."

The respect in which Wyatt was held by his brethren is evidenced by his filling the office of Master of the Carpenters' Company no less than three times, viz. in 1604, 1605, 1616.

In the same work are numerous examples of Merchants' Marks, some of them being very quaint. After seeing these, and also those marks on the pillar in the church, I am more inclined to the opinion that they are mason or trade marks.

In conclusion, allow me to thank you for the kind attention and the patient manner you have listened to this history of Godalming. My authorities have been:—Reports of the Surrey Archæological Society, especially that of Mr. Ralph Nevill, on the Corporation; "Names and their Histories," by Canon Isaac Taylor, 1896; "Bygone Surrey," by Clinch, 1895; "Highways and Byways of Surrey," by Cecil Parker; "The Homeland Series," by Prescott Row; Manning and Bray's "Surrey," 1804-14; "Church of Godalming," by S. Welman; "Picturesque Surrey," by Moule and Thompson; "Old West Surrey," by Miss Gertrude Jekyll; and I am indebted to Mr. J. H. Freeman, clerk of the Carpenters' Company; to the secretary of the S.A. Society (Mr. J. J. Jenkinson); to Mr. Prescott Row; also to Mr. Harradence and Mr. Potter for their kind assistance; to the town clerk (Mr. T. P. Whately), and to the general purposes committee for their kindness in allowing us to inspect the various documents, &c.; and to the vergers of the church for the assistance they have afforded me; and to the Mayor (Mr. S. Babington), for the valuable assistance and kindly interest he has shown to us this afternoon.

ELEMENTARY SCHOOL PLANNING.

MR. REGINALD G KIRKBY, A.R.I.B.A., F.S.I., city architect, Bradford, read a paper on the above subject before the Engineering and Architectural Sections of the Health Congress at Leeds last week. In the course of it he said the vitally important question of school planning is entering upon a new era. This is due to a growing dissatisfaction with existing models, and an increasing recognition of the need for housing children under better conditions during their school life.

For some years past architects have offered to authorities practically only one type of school—viz., the central hall type, with a series of class-rooms arranged round two or more sides of a central assembly hall. The calling for the submission of competitive designs from architects has doubtless been greatly responsible for the adoption of this type, to the exclusion of buildings of a more suitable character.

Whatever be the reason, it must be admitted that, in contrast with the originality and excellence of modern English architecture generally, school planning has tended to become so stereotyped that we find only one type of school building erected, in town and country alike, on the hillside and the plain indiscriminately, with little regard either to local conditions or educational requirements.

The advantages which may have been claimed for existing models are quite outweighed when consideration is given to the question of the children's health, and to the unsuitability of the buildings in relation to modern teaching methods and hygienic science.

The growing desire for healthier and better adapted schools has led, in a few instances, to the adoption and development of improved types of buildings, and noticeably so where city and county authorities have had the opportunity of consultation and investigation with their own official architects.

Plans of schools recently erected or in progress in Staffordshire and Derbyshire, and at Letchworth and Bradford, are illustrations of these newer types. In these improved schools a detached assembly hall is provided, adequate to meet the growing need for physical instruction, and the class-rooms

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are so arranged as to enable them to be from time to time flushed or scoured with fresh air, as well as at all times to be provided with cross-ventilation. In such schools children can be taught to love fresh air as nature intended they should, instead of their being compelled to sit in rooms with closed doors and windows, breathing impure air, many times fouled.

The provision of facilities for bathing in connection with these newer schools is a noticeable and welcome feature. Cleanliness should become a national virtue, and this can best be inculcated through the medium of school baths. Ideas of cleanliness learnt at school will be carried into the homes, and must have a far-reaching effect upon the rising generation.

Spray baths would appear to be the best type, with an occasional douche and slipper bath.

The regrettable amount of physical deterioration which is admitted to exist makes it highly desirable, if not even imperative, that open-air schools should be more extensively adopted, and the great benefits already derived from experimental open-air schools warrant their wider adoption. Far better that debilitated children should, through open-air schools, be given a chance to live and grow and develop, than that through inattention they should be allowed to drift into schools for the mentally defective, or otherwise become a burden to the ratepayers, possibly for life.

Open-air schools should provide resting sheds, class-rooms, teaching verandahs, baths and dining hall, with well-equipped kitchen quarters and other offices. A new school of this type just erected at Bradford will accommodate 120 scholars.

In a reflex way the principles embodied in the construction and working of open-air schools are tending to revolutionise school planning generally. Hitherto, school sites have often been selected without due thought being given to any consideration other than the cheapness or otherwise of the land.

Land which costs little in money, it should be remembered, is not always cheap. In future the suitability of the site for the purpose to which it is to be applied will become more and more a determining consideration.

Then in regard to construction, the floor area of class-rooms should be graded to suit the scholars. To assume that what is suited to a child of six is equally suitable for one of twelve is an absurdity. In any case a class-room should not be arranged to accommodate more than forty. This should be a class limit.

A large, single window, without heavy mullions, and almost the full width of the class-room, gives the best light.

If more fresh air be introduced naturally, a larger heating surface will be required to warm the room. But it will be found that children get used to the fresh air, and do not feel the cold so much if a plentiful supply is maintained.

Schools of the type illustrated practically ventilate themselves, and by their adoption some 30*s.* to 2*l.* per scholar is to be saved on the central hall type, the latter requiring necessarily some mechanical means of ventilation to maintain anything like a reasonable standard of atmospheric purity.

It should also be borne in mind that cloak-rooms should be numerous rather than large; that they should be well lighted and ventilated, top-lighting being preferable, and that they should be effectively heated in cold and wet weather. The usual 6 inches space per scholar is too small an allowance, especially in the girls' school.

All new efforts in school planning should embody provisions to meet the varied requirements under the recent Acts instituting medical inspection in schools and the feeding of necessitous children.

Whilst these principles of school planning will be expanded as they become more assimilated, yet education authorities should not hesitate in adopting them, notwithstanding the fact that in some cases a somewhat larger initial outlay may be necessary. Where this is the case, however, it will soon be realised that the compensating advantages to teachers, and the increased physical and educational attainments of the scholars, will far outweigh the other and merely temporary consideration.

The justification in the adoption of such principles will not be confined to architects and authorities alone, but is sure to meet the approval of the nation at large. For what can be more supreme folly than to neglect the units of the race in the earlier stages of their development, only to be burdened with them at a later stage in life as physically stunted and mentally dwarfed inmates of asylums, hospitals, prisons or workhouses?

PATENT OFFICE PRACTICE.*

IN choosing, as a subject for a paper to be read to this Institute, the practice established in the first year of the new Act, I had two objects in view. For a long time past I have felt that the means of making known the decisions on points of practice that arise from proceedings in the Patent Office are very inadequate. As a rule none of the decisions of the Comptroller are published (though a change has been made in this respect by the publication of his decisions as to revocation for non-working), and each year only one or two decisions of the law-officers appear in the Patent Reports. At the same time there are a very large number of decisions continually being given on points of practice and procedure which it would be very useful for those having to deal with patents to know. In choosing this subject I hoped, firstly, to be able to bring before the Institute in a collected form a number of such decisions, and I hoped even more that the discussion that would ensue would bring out and put on record a large amount of information which would not otherwise be available.

But when I attempted to actually collect this information, which I hoped to give to you, I found that the number of points which had been actually decided was surprisingly small. Nothing whatever had been published, and but for the kindness of the Comptroller I should have had to abandon this paper owing to lack of materials. Even the information that he has been able to give leaves so many points uncovered that I should not have troubled you to-night but for my second object—namely, to provoke a discussion in which I am sure much valuable information can be collected.

The results of the first year of course do not include anything dealing with the question of revocation for non-working, supposed to be by far the most important change introduced by the Act, and the rules made on this point do not, I think, call for comment. There will soon be a plentiful crop of decisions on this point, and it is well to leave the question for the present.

Another important effect of the Act has been that only patent agents having a real place of business are recognised at the Patent Office; but I will deal no further with this than by saying that the Office have sought to give full effect to this provision.

Practically the only points I shall attempt to deal with are those relating to patents of addition, patents for cognate inventions, and what has been called the "belated opposition clause."

There were in the first year about six hundred applications for patents of addition, and there is no doubt that this is a very popular innovation. So far there are no published decisions as to what is included in "an improvement in or modification of the original invention;" but this question must shortly come up. Various questions in relation to these patents have, however, been decided, and firstly the practice established is that the application must, in the case where the original patent has been granted and assigned, be made by the assignees of the patent, and that the reference to "applicants" in Section 19 only means that, where the original patent has not been granted, the applicants for such patent may apply for a patent of addition, and not that where the patent has been granted and assigned either the assignees or the applicants may apply. It has further been decided that the whole of the applicants or patentees, as the case may be, must be parties to any application for a patent of addition, but other persons may be joined in the application. This is an exceedingly convenient rule. For example, if one workman of a company makes an invention for which he takes out a patent and assigns it to the company, and then another workman makes an improvement, the company would be able to join the second workman in their application for a patent of addition, and such workman would then, of course, make the declaration as to being the inventor. It has further been held that an ordinary application for a patent can be amended so as to make it an application for a patent of addition at any time up to the grant, even where a complete specification has been accepted and published, and this applies also to patents which were applied for before the Act came into force.

With regard to patents for cognate inventions there are still many points which are either undecided or as to which I have been unable to get information. In the first year between one and two hundred applications were made to put in a single complete specification on several provisional specifications, but so far only a few have been published. The Patent Office, I believe, are adopting a liberal construction as to what is meant by cognate inventions and allow practically the same liberty in joining different provisionals in one complete specification as they would had the same matters been contained in one provisional specification, and there seems little doubt that this was the intention of the Act. I have been unable to hear of any decision as to whether, where a complete specification has been put in and a further provisional subsequently filed, an amendment would be allowed by which the matters contained in such further provisional were incorporated in the first complete

* A paper read before the Society of Architects, entitled "Some points in Patent Office practice arising out of the first year's working of the new Act," by H. Fletcher Moulton, Associate.

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specification. Nor have I been able to find out whether, where, under Section 6, Subsection 3, the Comptroller has required a part of the complete specification to proceed and a further part to be taken out and treated as a separate provisional specification on the ground of disconformity, the applicant will then be allowed to join the two in one complete specification, of course distinguishing the parts depending on the two provisionals.

In complete specifications which I have seen there is no attempt made to ear-mark the claims that refer to matters contained in the various provisionals. When an action comes to be fought on any of these patents there is no doubt that some very complicated questions will arise, since in deciding on questions of novelty it will be necessary to see, in regard to the different claims, to which provisional they must be referred, in order to decide on the date at which novelty must be established.

I think it may be well to develop this question a little more fully, though possibly it does not come within the title of this paper. Up to the present there was no doubt as to the date at which novelty of the invention claimed had to be established. If the invention was novel at the date of the application, that was all which needed to be proved. But where a series of provisionals dealing with improvements, say, in a particular machine, have been put in and claims have been made, whose wording very probably differs from anything described in the provisionals, it may be necessary to consider in which of these provisionals the invention claimed in each particular claim first appears, and whether it possessed novelty at the date of such provisional. There will probably be a further question as to how far the invention, even if not described in the first provisional, can be said to be a fair development of the invention there described. In fact, whether the patentee can say that it was merely as a measure of precaution that he put in a further provisional specification, and that for the purposes of determining the question of novelty the date of the earlier specification should be taken. This question is likely to be of importance because publications are very apt to occur during the development of an invention. The inventor is often unconscious of disconformity and may only put in the later provisionals on taking professional advice. These considerations make it extremely important even where a second provisional is put in to make the invention therein described appear, as far as possible, a development of that described in the earlier provisional specification.

With regard to the "belated opposition" section there were a dozen case of applications for revocation under these new powers. But there seems little to say about these, as they resemble ordinary opposition cases. It should, however, be noted that it has been decided that there can be no application made to revoke a patent before it is granted, and that if the time for opposition has elapsed the opponent must wait until after the grant before applying to revoke. It has also been decided that where there has been an unsuccessful opposition the opponent cannot apply under this section to revoke a patent, and if he has let the time for appealing against the decision pass, his only course is to apply for special leave to appeal.

Rule 51 introduces an entirely new question for the consideration of applicants and their professional advisers, that is to say, whether the patent to be applied for shall be a grant in the ordinary form or a joint grant for all purposes—*i.e.*, one in which the death of one of the patentees terminates not only his legal interest in the patent, but also his beneficial interest. It seems doubtful whether many applicants will care to avail themselves of a patent of this kind, and more probably any deviation from the ordinary results will be effected by agreement as heretofore.

THE CONCRETE INSTITUTE'S FIRST ANNIVERSARY.

THE Concrete Institute, of which the Earl of Plymouth, C.B., is president, and which has now over 750 members, celebrated its first anniversary on Thursday, July 22, by a visit to the largest Portland cement works in Europe, i.e., the Swanscombe branch of the works of the Associated Portland Cement Manufacturers, Ltd., near Gravesend, better known as the J. B. White Bros.' branch.

About 100 members of the Institute attended this visit, and among the party were Mr. Edwin O. Sachs, F.R.S.Ed. (chairman), Mr. E. P. Wells, J.P. (hon. treasurer), Mr. C. H. Colson, M.Inst.C.E. (Admiralty), Mr. W. T. Hatch, M.Inst.C.E. (Metropolitan Asylums Board), Mr. W. G. Kirkaldy, Assoc.M.Inst.C.E., and Mr. George Corderoy, F.S.I. The visitors were met at Cannon Street station at 10.30 A.M. by the Chairman of the Associated Portland Cement Manufacturers, Ltd. (Mr. F. A. White), and by Mr. H. H. D. Anderson, Mr. Herbert Brooks, J.P., Mr. H. K. G. Bamber, F.C.S., Mr. Alfred Stevens and other directors, and were taken in saloon carriages to Northfleet, where they were entertained to luncheon at the Factory Club. They were then driven by special trams to the Swanscombe works, which contain the largest installation of rotary kilns in this hemisphere. The output by this plant alone exceeds 600,000 tons per annum. The visitors went over the works in eight groups, each group being under a technical guide and a director of the company, and so a most thorough and instructive inspection was insured. Afterwards the visitors were entertained to tea, and they reached London again by 7 P.M.

Mr. White, in welcoming the party, dwelt on the rapid development of the Concrete Institute into one of the most important institutions.

Mr. Sachs in his reply commented on the broadminded policy of the company in including in their invitation such members of the Institute as happen to be directors or chemists to competing cement works. This policy, he pointed out, made for a greater efficiency in the whole of the nation's Portland cement output, a factor of importance in such a great industry as that of the Portland cement trade. Mr. Sachs also remarked on the danger resultant from the keen competition in the selling price of Portland cement, as the building owner really buys the material almost at cost price (few indeed of the cement makers paying anything more than an interest on their preference capital, if as much as that). The rivalry of cheapness allows large manufacturers to keep up their quality, but makes it extremely difficult for the small manufacturer to follow suit. As a matter of fact, he considered the price of Portland cement unnecessarily cheap. There was no reason why the price should not be a little higher, for 1*s.* per ton made but an infinitesimal difference in the cost of a 25,000*l.* building.

Others who spoke on the occasion were Mr. Bamber, Mr. Colson, and Mr. Munro.

GAS HEATING RESEARCH.*

(*Concluded from last week.*)

FROM general observations of the thermopile readings obtained to the end of experiment 11, it appeared as if more energy were radiated above the stove than below it. It was thought that this must be wrong, as by inspection the under surface of the fuel appeared hotter than the top. For this reason there was every justification for raising the equatorial line and the radiometer so that their centres were in a horizontal line with the centre of the stove. Although this, obviously, would make very little difference to the total energy found as radiated, it would considerably alter that found as being radiated above the floor level. In experiments 13 and 14, the effect on the radiation of increased ventilation up the flue caused by putting the fan at full speed, was tried. About 1,900 cubic feet of air passed through the top of the stove per hour, but no appreciable difference in the amount of energy radiated occurred.

In experiments 15 to 20, the fan was turned off completely, and the size of the stop slightly varied. Ventilation was reduced to about 500 cubic feet per hour, but no difference of note in radiation was brought about by decreasing the draught up the flue. From this it is concluded that radiation is not influenced by changes of draught up the flue. This is because the volume of air pressing up the flue did not come into contact with the radiating surface, but passed in at the top of the stove. It is reasonable to conclude then that, under the conditions of these experiments, the amount of energy radiated from the stove lay between 30 and 33 per cent. of the total energy generated by the stove. Of this, about 25 per cent. was radiated above the floor level. In experiment 21, a reflector was placed at the foot of the stove, and the amount of energy radiated above floor level was increased to 28.6 per cent.

It is interesting and extremely suggestive to note what happened during the process of combustion. The gas mixed with air left the Bunsens, and was lighted. At first the flame was comparatively short, and heated the inner surface of the fluel. As this became hotter, the flame lengthened until it reached the top of the fuel, the edge of the outer cone of the flame playing on the inner surface of the fuel. The fire-clay began to radiate in all directions. The radiations from the back of the fuel were sent out into the room,

* Extract from report of the Gas Heating Research Committee appointed by the Institution of Gas Engineers in conjunction with the University of Leeds, and consisting of Messrs. John Bond, J. H. Brearley, and Charles Wood, in co-operation with Professors Arthur Smithells (Chairman), William A. Bone, and Julius B. Cohen, of the University of Leeds, and Mr. E. W. Smith (Research Chemist), to the Institution of Gas Engineers, at their Annual Meeting held in London during June, 1909.

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except those that were intercepted by the front of the fuel. These were not altogether lost to the room, but were re-radiated to the back surface of the stove, raising its temperature and consequently its radiating power. The bulkier parts of the front of the fuel did, however, affect the radiations sent into the room, as is seen on examining the thermopile readings taken over the whole surface of the stove.

These parts are generally found on the left-hand side of each piece of fuel, and it is worthy of note that in all experiments the readings at 20° and 40° to the left of the stove were a little lower than those 20° and 40° to the right. This would seem to indicate that either the front of the fuel should be much thinner in order that it might attain a higher temperature, and therefore emit more radiations, or that it should be made more open and the back of the fuel more compact so that more direct radiations would be sent into the room. The temperature of the products of combustion, on leaving the stove, varied with the volume of air passing through the stove-flue. Should the house flue be closed except for the stove-pipe, the suction on the stove-flue will be very great, and the flue loss of heat correspondingly high. Should, however, the house-flue be open and the stove-flue about four feet in length, with its entrance restricted there will be a smaller volume of air passing through the stove-flue, but an increased ventilation up the house-flue.

Experimenters have often tried the effect of preheating the air that is used in the combustion of the gas, but so far as is known, no one has seriously tried the effect of also preheating the gas before mixing with the air. There is no reason why it should not enter the Bunsens at the temperature of the escaping products of combustion (90 to 100° C.). A certain proportion of the heat will always be required for the purpose of carrying away the waste gases, but 3,000 B.Th.U. per hour is excessive. There is ample scope here for further experimental work.

Determinations were made of the amount of heat passing directly up the flue and lost to the room. It will be seen by referring to Columns B, F, and K that this was proportional to the volume of air passing up the flue.

B.	F.	K.
Fan off . . .	19 per cent.	500 cubic feet of air
Fan half on . .	30 ,,	1,500 ,, ,,
Fan full on . .	42 ,,	1,900 ,, ,,

About 40 per cent. of the heat generated by this type of stove was heat of convection and conduction—viz., that neither radiated nor passing up the flue. This, as well as the radiated energy, was available for heating the room. The energy radiated into the room struck the walls and furniture in the room, and was converted into molecular energy. The air was warmed by contact with the warm walls, &c., and by passing over the stove. The air of the room was heated very little by the radiations passing through it, but very much by its passing over the objects in the room which had been heated by radiated energy. In this way radiant energy became convected heat. This quantity increased with the volume of air passing through the room.

The temperature of the air passing through the room rose as the volume of air decreased. The volume and temperature being known, a simple calculation gives the volume of air that might be heated from 45° F. to 60° F.

Vitiation of the Atmosphere by Means of Carbon Dioxide from the Stove.—Whenever the volume of air passing up the flue fell below about 1,000 cubic feet per hour, the amount of carbon dioxide escaping into the room increased considerably, whereas above 1,300 cubic feet the escape was only very slight indeed experiments (1 to 14). In no case, even in the small room used, and with the abnormally low ventilation as existed in experiments 15 to 18, was the amount of carbon dioxide greater than 6.2 parts per 10,000. Carbon monoxide was very carefully looked for. Blank tests were made with the outer air, and slight discolorations of the chloroform occurred. In no case did the room air show a deeper colour than the blank, and only when ventilation up the flue had been very much restricted, as in experiments 15 to 18, was any found in the flue gases.

As the ventilation experiments were always run over night, and lasted from 15 to 20 hours, it was ensured that conditions had become constant. During the whole time samples of (1) the room gases, (2) the flue gases, and (3) the coal gas burnt were being collected for analysis. The room was never entered during the experiment, and all temperature and hygrometer readings were taken from outside. At the end of the experiments the manipulator entered the room by means of the double door, letting in as little cold air as possible. In this way the "smell test" could be determined. Only in experiments 15 to 18 was the smell and heaviness of the room air unpleasant. This might be due to (1) the percentage humidity being low, (2) to the high temperature, and (3) to the presence of carbon dioxide.

The percentage humidity of the room decreased with the rise in temperature (experiments 15 to 17), although the percentage increase in the weight of water vapour present per cubic foot of air was higher. This was to be expected. It was stated in the report of the Smoke Abatement Society's research (1906) that a humidity of 58 to 72 per cent. at 15° C. is agreeable. The average room temperature in these experiments was abnormally high, being 25° C. At 15° C. the percentage humidity would increase to within this agreeable limit. If the radiating efficiency of the stove were increased, the amount of convected and conducted heat would be less, and although less heat would go to raising the temperature of the air of the room, more would go directly to warming the walls and objects about the room. This would mean that the "drying" effect would not be so great.

The radiating efficiency of the so-called gas radiators, having open fires, was determined (experiments 22 and 23). In the case of the large type of condensing stove (22), they radiate about 25 per cent. of their heat, and with the smaller type 22 per cent. This could be increased by doing away with the ironwork in front of the radiating surface.

Summarising it has been found that:—

1.—The total radiation from an open gas-fire is about 32 per cent., and this is unaffected by the amount of ventilation through the room.

2.—No carbon monoxide escapes under ordinary conditions into the room, and very little is ever found in the flue.

3.—About 30 per cent. of the heat generated in the stove passes directly into the flue. This figure varies with the volume of air passing through the stove flue.

4.—There is no necessity for products of combustion to enter the room and cause discomfort.

5.—Reflectors may be usefully employed to produce a sensible increase of radiation into the region where it is most wanted.

ART EXHIBITIONS.

WHEN the organisers of the New Gallery adopted this year the unusual practice of dividing their summer exhibition into two sections they reversed the order that was to be expected, for they arranged a better show in the second than they did in the first. Perhaps this reversal was a little unwise, as visitors might be expected to form their judgment from what was shown at the first, as to whether the second exhibition would be of sufficient importance to call for inspection. Whether the rather commonplace character of the first section which was opened in April made a bad impression or not it would not be easy to say, but the fact remains that when a few days ago we went round the three fine rooms in Regent Street we were almost in undisturbed enjoyment of the many excellent pictures on the walls. There are certainly at present a very large number of counter-attractions for the lover of contemporary, modern and ancient art, and it may have happened that on that particular occasion the rival shows chanced to be in the ascendency. There can be but few dilettanti who have enough enthusiasm to visit every exhibition in London that is pronounced to be worth seeing. Such a verdict can unhesitatingly be pronounced as to the latest portion of the twenty-second summer exhibition at the New Gallery which closes on August 14. It is true that some of its more conspicuous works have been seen elsewhere, for it was agreed that whereas the first portion should consist entirely of works not previously exhibited in London, the exhibitors reserved to their discretion the right to make the second more or less retrospective.

The visitor would be hard to please who was not charmed by the group of pictures Nos. 17 to 27 in the South Room, each by a different artist. If he is most attracted by landscapes there is "Barrow Down, Dorset," by Mr. H. Hughes Stanton, a bold rendering of a large space with majestic clouds; for the fanciful mind there are three pictures of sea maidens, the one by Mr. E. Reginald Frampton is entitled "A Pearl," showing the oyster home of the sea goddess. Of another character altogether is "The Return from the Pageant," by Mr. T. C. Gotch, which suggests that the young performers give as much enjoyment in an informal journey back to their homes as in any of the official episodes. The light of the Chinese lanterns is just of the right sort to harmonise with the holiday scene. "A Sleeping Girl" is

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one of the three charming, though small, contributions to the exhibition by Mr. R. Anning Bell, each of which is prominent for an easy spontaneity and unstudied effect which contrasts with the impression of laboured striving towards the decorative sometimes seen. Near to this group is an Eastern subject by Mr. John Lavery, R.S.A., "Moonlight—House tops, Tangier"; brilliant though such light may be we would expect to see more subtlety and greater play of mysterious shadows among these close-packed houses with walls of brilliant white. In "St. Martin's Summer" Mrs. Swynnerton has revelled in bright colour and daring composition, for that delightful season is typified in a voluptuous winged female.

In the West Room "The Mill Pond," by Mr. Charles Shannon, is as full of masculine vigour as the five bathers who are so prominent in the picture. It should be compared with Mr. Cecil Rea's "Bathers" in the adjoining room. There are two exceptional portraits in this room, viz., "The Velvet Coat," by Sir James Guthrie, P.R.S.A., and "Babs," by Mr. J. J. Shannon, R.A., elect and others by less prominent artists. Mr. Shannon must have wished to emphasise the diminutiveness of the little girl who seems to be bravely combating her uneasiness as she stands in (presumably) her underclothes before a heavy curtain, and is wondering whether it is a game or not. It arouses a feeling of amused pity for the "poor little thing" rather than of admiration for a charming little girl. Sir J. Guthrie has added to a high reputation by "The Velvet Coat"; possibly he was puzzled as to how to produce something striking out of his sitter, and consequently was moved to make a departure from ordinary portraiture. The elderly lady appears to have been stopped momentarily as she rose out of her chair and was leaving the room; the pose is of an arrested motion that will be resumed as soon as some question has been answered. Mr. Herbert Draper no doubt intends at some later time to people his "Land-locked Bay" with sirens and shipwrecks, for the high and precipitous cliffs must assuredly be more accustomed to stormy buffeting than to the lazy ripple of the summer waves as here shown. This atmosphere of unruffled peace contrasts well with the movement in "Fresh Weather in the Channel," by Mr. Julius Olsson, near by.

Mr. W. Lee-Hankey has rendered two very dissimilar subjects in "It's the Child's Turn Now," and "In the Shadow"; the first is an open field with strong light on the dead mother and her little girl, the second is full of uncertainty in the heavy shadows and dim evening light showing the soft mellow tones of an old cottage. "The Incoming Tide," by Mr. R. W. Allan, is typical of fishing boats bringing home their hard-earned catches. In this North Room is a portrait by Mr. John Lavery, "Mary in Green," which, like his "Mrs. Rattagan," will give much pleasure to all who see it. An unmistakable air of distinction belongs to "The Artist's Wife," by Mr. J. Young Hunter, thanks to the pose and dress and figure.

The Central Hall contains as usual sculpture and handicrafts by artists of high reputation and merit.

THE LATE JOHN ARCHIBALD CAMPBELL, F.R.I.B.A.

IN our last issue we announced the death on July 19 of Mr. John Archibald Campbell, senior partner of the firm of Messrs. John A. Campbell & A. D. Hislop, architects, Glasgow. Mr. Campbell served his apprenticeship with the late Mr. John Burnet, and thereafter studied for a number of years in Paris, and travelled on the Continent. When he returned to Scotland he again entered the office of Mr. John Burnet, and in the year 1886 was assumed by Mr. Burnet, with Mr. John James Burnet, as a partner under the firm name of John Burnet, Son & Campbell. The partnership was dissolved in 1897 when Mr. Campbell entered into business on his own behalf. He recently assumed Mr. A. D. Hislop as a partner. Mr. Campbell won the Tite prize of the Royal Institute of British Architects in 1885 and was elected a Fellow in the year 1906. He was a prominent member of the local institute.

Mr. Campbell's work is well known. His most important commissions were perhaps the various important office blocks and insurance buildings designed by him in Glasgow, which all bear evidence of scholarly skill and marked individuality. The following are some of the most recent:—The Edinburgh Life Assurance building, the Northern Insurance Company's building, the Britannic Insurance Company's building, and the West George Street Property Company's building. His domestic work was also very fine, and a large number of important mansion houses have been erected to his designs. He was a regular contributor to the Royal Scottish Academy and the Glasgow Institute of Fine Arts. He was architect for the Queen Victoria School and Memorial Chapel, Dunblane, recently opened by H.M. the King, and at the opening ceremony was presented.

Mr. Campbell was fifty years of age and was unmarried.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* has in its tour of the southern States now reached Birmingham, Alabama, where the magnificent railway station has attracted its attention and occupies the whole number. Both for extent as an engineering problem and for the merit of its architectural design, due to Mr. P. Thornton Marye, this is one of the notable railway stations of the world.

Die Kirche has for its chief subject the new parish church of St. Wolfgang at Munich, of which Hans Schurr is the architect. Designed in the Baroco manner of German eighteenth-century work, this is quite a remarkable work. The plan, starting from the basis of an internal elliptical dome over its central area, with extensions east and west on the major axis, is full of interest and highly effective both within and without. Quite distinct in motif yet striking in effect is the church of St. Paul at Cologne, by Stephan Mattar, architect, a monograph of which is reviewed, with illustrations.

Deutsche Bauzeitung further illustrates the competition for new police buildings at Munich, to which it has already given much attention. It also takes occasion of the International Archæological Congress at Cairo to illustrate some of the buildings of that city, as well as the arena of some of the latest explorations.

Het Huis has an interesting article, with many illustrations, on the seventeenth-century representation on medals of buildings in Amsterdam, Haarlem, Leyden, Dordrecht, and other towns of the Netherlands. There is also a pleasing account of the Flehite Museum at Voorgevel, in which an air of completeness is obtained by the design of the room according with the objects it contains, thus presenting the picture of interiors as they were when their components were produced, a method of treatment quite possible in a small museum and very effective as well as informing. Voorgevel is worth a visit in order to see this museum.

Dekorative Kunst gives us some illustrations of the International Photographic Exhibition at Dresden and of a somewhat curious block of buildings in the Nassauischen Strasse, Berlin, in which, as part and parcel of one design, a church is combined with residential flats, a development of property belonging to the Old Lutheran community of Berlin. No plan is given, but the photographs suggest that the problem has been rather cleverly tackled, and a not inharmonious combination effected of a distinctly ecclesiastical and secular expression in the several parts of the design. An interesting article appears on the students' work at the Art Training School of Zurich.

Stone shows us some remarkable sculptures in Woodbury grey granite by H. A. MacNeil for Cook County Court House, Chicago—seated male figures of "The pioneer spirit of Chicago" and "Lake navigation."

The *Engineering Record* contains a paper on "Concrete Reinforced by Nails," read before the recent convention of the American Society for Testing Materials by Leon S. Moisseiff, which shows to what extent the compressive strength of concrete can be increased. The most striking result was a compressive strength of 17,800 lb. per square inch on a cube fifteen months old.

COMPETITION RESULTS.

MESSRS. BRIGGS, WOLSTENHOLME & ARNOLD THORNLEY, FF.R.I.B.A., architects, North John Street, Liverpool, have been successful in the limited competition for the proposed arts building for the Liverpool University Buildings. Their design, marked "Quadrangle," was selected by Mr. E. Guy Dawber, the assessor, out of the four designs.

The Court of Common Council have adopted a report of the streets committee recommending the removal of the gates enclosing the parish of St. Bartholomew-the-Great, Smithfield, and granting 1,500*l.* to the trustees by way of compensation.

The Council of the Royal Sanitary Institute have accepted the invitation to hold the annual congress at Brighton in 1910.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, August 7.

Institution of Municipal Engineers: Annual General Meeting at Durham.

Brighton and Hove Archæological Club: Excursion to Wolstonbury.

Monday, August 9.

Architectural Association: Annual Excursion, Headquarters at Cheltenham, August 9 to 14.

Tuesday, August 10.

Sheffield Master Builders: Return Visit from the Belgian Builders August 10 and 11.

Saturday, August 28.

Architectural Association: Camera and Sketching Club, Visit to Croydon and Beddington.

THE BRITISH MUSEUM.

ALTHOUGH the number of visitors has not reached the high-water mark of the attendances in the years 1903 to 1905, that for last year shows a considerable advance beyond its immediate precursor, being 743,413 as against 646,300. The number of students remains practically steady, there being but a fractional decrease from 55,738 to 55,676.

The extension of the buildings at Bloomsbury proceeds very slowly, as no building operations have been undertaken in connection with the new wing in Montague Place with the exception that a contract for building the new boiler-house was entered into during the autumn, and this is still in progress. A commendable piece of work has been the construction of fire-resisting divisional walls in the roof of the western and southern galleries of the Museum, and provision has been made for continuing the work in other sections of the roof. The evil effects of the manner in which Government starves our great national museums is seen in the fact that an iron shed has had to be erected for the accommodation of casts from the antique, recently transferred from the Victoria and Albert Museum. Of course the new wing ought to have been ready for them, but at the rate it is proceeding the iron shed will be worn out before a permanent home is able to accommodate this acquisition.

All departments of the Museum have added to their treasures. The Department of Printed Books has acquired eighty English books printed before the year 1640, and sixty-four Incunabula (books printed before the year 1501). The student of hygiene should be interested in PLUTARCH's "De tuenda bona valetudine precepta Erasmo Roterodamo interprete," printed by RICHARD PYNSON, 1513, and Sir THOMAS ELYOT's work "The Castel of Helth," printed by THOMAS BERTHELET, 1539. Of interest also is the record by Mr. FREDERICK M. FAY, Master of the Merchant Taylor's Company for 1895-6, entitled "A Historical Collection of the Pictures, Herse-cloths and Tapestry at Merchant Taylors' Hall, with a list of the Sculptures and Engravings."

The Department of Manuscripts has been fortunate in receiving by bequest a Latin psalter written throughout in gold and containing a portrait of the Emperor LOTHAIRE (840-55) and two other miniatures, with explanatory verses, and, among other supplementary matter, a prayer composed apparently by a sister of LOTHAIRE, and mentioning him and other members of her family. This manuscript was probably written for this lady or for a religious house in which she was interested; as early as the tenth century it belonged to the abbey of St. Hubert in the Ardennes, and it remained there till the French Revolution. To the upper cover is attached a large silver-gilt medallion containing a crowned head in profile in high relief, perhaps of the ninth century, and on the lower cover is a fine ivory figure of DAVID, of the twelfth century. In the same bequest (by the late Sir THOMAS BROOKE, Bart., of Armitage Bridge, Huddersfield) were included three monastic chartularies, of Cockersand Abbey, county of Lancaster, 1268; of Fountains Abbey, county of York, fifteenth century; and of Selby Abbey, county of York, fourteenth century. Amongst other acquisitions of this department we may specially mention a chartulary of Waltham Abbey, county of Essex, compiled by ROBERT FULLER, the last abbot, 1526-40; Collections relating to Kent, including muster-rolls and inventories of church furniture, 1548-9, early seventeenth century; Monumental inscriptions "in the part of Holland in Lincolnshire," apparently collected by ROBERT TAYLOR, of Heckington, 1790; Drawing in pencil by HENRY DAVY of the north porch of Great Bealings Church, county of Suffolk, 1852; Accompts for building and repairs of the Cathedral of Troyes, including the erection of the great bell-tower, July 1410 to July 1411.

The Department of Prints and Drawings has acquired some interesting drawings of the French and English schools, and has added to its collection several choice specimens of Japanese wood-cuts by HIROSHIGO, HOKUSAI, KIYOMASU, KIYONAGA, KORIUSAI, KUNISADA, and others. We may specially note amongst the additions to the collections of this department forty-six drawings and sketches by PIRANESI of Roman ruins, imaginary classical buildings, &c.; etchings by CHARLES MERYON of "Chenonceaux" and "Chevet de St. Martin-sur-Renelle"; drawings by SAMUEL PROUT of Temple Farm, near Rochester, and Quarry House, at Rochester, these being presented by Mr. R. PHENE SPIERS, F.S.A.; a collection of "Drawings of Old London," by W. C. ALEXANDER.

By the Department of Greek and Roman Antiquities the Account of the British Museum Excavations at Ephesus (1904-5) has been published, and a fourth edition of the Guide to the Sculptures of the Parthenon has been issued. A Guide to the Exhibition of Greek and Roman life and a catalogue of the Roman pottery have also been published. Amongst the acquisitions of this department may be specially mentioned a bronze arm of a couch decoratively treated, of Græco-Roman work, on the upper end of which is a bust of ATHENA, or ROMA, and on the lower end a bust of a woman veiled, perhaps HERA, whilst between them is a figure of DIONYSOS reclining and holding a wine cup. A notable donation by W. C. ALEXANDER, Esq., through the National Art Collections Fund, is a bronze statuette of a negro boy mounted on a high base, which is of the best period of Græco-Roman work. The figure, which is infibulated, is of a strong thin-limbed type; he is nude, and stands with his left foot advanced, right

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hand on hip, and left hand raised above the head. On the palm of the hand are marks of an attachment, as if it had supported some heavy object, such as a lamp, and the eyes are directed towards the hand. The base is unusually large, circular in shape, and supported on three lions' feet. Both statuette and base have an uncommonly fine smooth grey patina. Other acquisitions of interest by this department are a marble head of a youth of supposed Polycleitan style, of the type of the "Westmacott athlete," Greek work of the fifth century B.C.; and a series of fragments of wall plaster from Rome with various decorative designs painted in colours.

The Department of British and Mediæval Antiquities and Ethnography has not during the past year issued any catalogue, though that of ivory carvings has been prepared for press, and further progress has been made with the Guide to the Ethnographical Gallery. The acquisitions of the department have been numerous, ranging in date from palæolithic implements found in a gravel pit at Kennet, near Newmarket, to a brass snuff-box with bust of Shakespeare and inscription relating to the Commemoration, April 23, 1816. The field covered by this department under the title of ethnography is unlimited; hence the large number of acquisitions. Amongst these we may note in the prehistoric section an ornamented bronze celt with flanges found in the Thames near Medmenham Abbey; a bronze dagger blade with three stout rivets, found at Sproughton, near Ipswich; a small bronze dagger blade, found at Firle, Sussex. An important series of flint and stone implements, and implements, ornaments and pottery of the Bronze and Early Iron Ages, chiefly from Hohenzollern and the Swiss Lakes, has been presented by the Rt. Hon. Sir John Brunner, M.P., and Sir Henry Howorth, K.C.I.E.

In the Romano-British Section there have been raised from a Roman villa discovered in 1908 at Hemsworth, near Wimborne, Dorset, and added to the collection, a tesselated pavement with Venus rising from the sea and dolphins in the border, and other pieces of Roman paving, including squares of tile and Kimmeridge shale so used. A curious acquisition in this section is ten specimens of Gaulish redware dredged from the Pudding Pan Rock, Herne Bay, Kent. In the Anglo-Saxon Section has been acquired a remarkable bronze bowl of early British character, with two of three escutcheons for attaching chains for suspension which, with the bronze and iron mounts of a wooden bucket, an iron spear-head, and other objects, was found at Ewelme, Oxon, on the site of a cemetery. The many other acquisitions of this bric-à-brac department seem to us to be, as a rule, more curious than valuable or instructive.

The Department of Coins and Medals has acquired during the year 5,543 coins and medals, of which 105 are of gold, 1,662 of silver, 3,681 of bronze, and 95 of other metals. The most important acquisition is that of the Leopold Hamburger collection of Greek coins of Phœnicia, Palestine, and neighbouring countries, including a certain number of Roman coins relating to Judæa. The collection comprises 17 gold, 166 silver, and 2,546 bronze coins.

NOTES AND COMMENTS.

Mr. Edwin T. Hall, as chairman of the Estates Governors of Dulwich College, has, in a letter to the daily Press, well shown the futility of the arguments of those who assert that building land is "held up" by its owners or "allowed to waste" by not being at once covered with houses. What is true of the Dulwich College Estate is true elsewhere, and Mr. Hall points out that as there are already 4,670 empty houses in the boroughs of Camberwell and Lambeth, the erection of an additional 3,000, which would involve an outlay of 1,620,000*l*., would, even if these new houses could be sold at a considerable loss, merely result in increasing by thousands the number of unlet houses elsewhere in the boroughs. Thus, according to the Budget proposals, the Dulwich College Estate is to be taxed because its Governors do not, at a serious loss to their trust, bring ruin on many other owners of house property in the boroughs of Camberwell and Lambeth. The idea of taxing landowners because they do not let land on which nobody wants to build seems to us ridiculous in the extreme. Are the ratepayers of London to be taxed because their representatives, the London County Council, cannot let at once the land in Kingsway at a price which experienced valuers say it ought to command? Then, again, Mr. Hall points out that the uncovered land belonging to Dulwich College is fulfilling a very useful service to the community by providing playing fields, the demand for which is greater than the supply. This is true of many parts even of the county of London, as everyone knows who has tried to find a ground for a cricket, tennis or football club. One of the great causes for the lamentable decay of amateur clubs and the increase of professionalism in London is the difficulty of finding a bit of turf on which to play without a long and expensive journey.

With the desirability of a Ministry of Art as distinct from the department of the Board of Education advocated by Mr. J. Fisher, Chairman of the Society of Art Masters, at its annual meeting, we thoroughly agree, not only because it appears that Art Masters have no direct representation on the Consultative Committee of the Board of Education, but because the recognition of art as a matter of public importance goes beyond the question of education, and the regulation of art matters in other directions would afford ample occupation for the most industrious and hard-working member of the Ministry.

Anything that tends to reduce the cost of freight is an advantage to the trade, and hence to the wealth of the country, and therefore the idea of a clearing-house in London for dealing with goods carried over the various railway systems in the metropolis, for which Mr. R. Stephen Ayling, F.R.I.B.A., has prepared plans of a building 400 feet wide by 1,000 feet long, capable of accommodating forty trains of fifty waggons each, is one worthy of consideration. It is estimated that by the provision of such an institution the railway rates could be reduced by 66 per cent., which, if correct, would be of great advantage in assisting British producers to compete more successfully than at present with foreign exporters.

It is good news to hear that the Smithfield Gateway is to be preserved, a contract having been signed for the purchase of the superstructure of the gateway and a portion of the house on its south side, and we hope the rector may soon receive donations of the further 500*l*. odd required to complete the purchase and repair the building internally, so that this interesting relic of old London may be rendered safe.

That the "model dwellings" in huge blocks of several storeys as the solution of the housing problem should be no longer regarded as the best or the only possible is matter of congratulation on every score. That for this system should be substituted the two-storey cottage in the suburbs with a bit of garden must lead to healthier and happier lives for town-workers. The annual meeting of the Improved Industrial Dwellings Company showed that this body, which is run on business lines, recognises the change that increased facilities for locomotion has rendered possible and profitable alike for the Company as for their tenants. It is the bit of garden that is the main factor, for not only does the tenant gain by its produce, but the time spent in working it is recreation, less expensive than any open to the town-dweller in a block of model dwellings with its paved courts.

Ivy may be pretty to look at and so add to the attractiveness of ruins for the ordinary visitor, but the members of the Kent Archæological Society had impressed upon them the destructiveness of the plant when visiting Eynsford Castle, which probably dates back to the time of Henry II. There is some difference of opinion as to whether or not ivy makes a wall damp, and whilst its

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influence on sound walls with good mortar may be small, there can be no doubt that its growth is extremely prejudicial to old walls whose surface is insufficient to prevent its intrusion into their interior.

The alteration proposed by the Tariff Bill of the United States to prevent imposts on works of art brought into that country is certainly popular with the citizens. That such works if in existence for more than twenty years should be admitted free instead of paying twenty per cent. ad valorem duty, or under the most favoured nation clause fifteen per cent., may be trusted to extend the eagerness with which the patriotic nouveau riche of Chicago will pay high prices for the valuable works of art that still remain in the country houses of England, and so deprive us of some of the treasures that are to some extent national possessions. But the manufacturer of genuine antiques will have a glorious time; old masters whose paint is hardly dry, old furniture with shot-made worm-holes, Egyptian and Buddhist deities made in Birmingham will flood the American market, especially if the price is high—and the dealers may be trusted for that. Why the limit of twenty years' age should be selected it is difficult to conceive. It will not ensure veritable antiques, nor if the standpoint of excellence in art is supposed to be desired will this be safeguarded, for the work of to-day may be as pre-eminent as any that was produced twenty years or more ago. There is a valid argument in favour of the free admission of works of art as art, but none in favour of antiques, which on the one hand are not necessarily good because they are old, and on the other may easily be forgeries.

COMPETITION FOR NEW ARTS BUILDING.

THE UNIVERSITY OF LIVERPOOL.

THE Council of the University invited competitive designs from Messrs. Briggs, Wolstenholme & Thornley, FF.R.I.B.A., Mr. J. F. Doyle, Mr. F. W. Simon, F.R.I.B.A., and Messrs. Willink & Thicknesse, FF.R.I.B.A., all of Liverpool, for an extension to the Victoria Building to house the Faculty of Arts, and appointed Mr. Guy Dawber, F.R.I.B.A., as assessor. The site has frontages to Ashton Street and to the quadrangle, and the competitors were not restricted in any way by ancient lights.

The Council desired that the new building should harmonise in form and colour with the present University, but did not bind the competitors to follow the existing internal or external detail. In their designs the competitors had to arrange their schemes so as to render possible a reconstruction of that part of the present building from the corner of Ashton Street to the junction with the new building for the purpose of providing future head quarters for the University Library, from which the principal departments of the new building will radiate. All the designs are on a similar principle and have a centre corridor with rooms on both sides.

The selected design is that submitted by Messrs. Briggs, Wolstenholme & Thornley, under motto "Quadrangle." The arrangement of each floor being simple and direct, is without waste. As will be seen by the accompanying sketch the entrance is from the quadrangle in the centre of the building and leads into a large entrance hall, with the staircase facing the entrance, and the corridors running right and left. The ladies' cloak rooms and sanitary conveniences are well arranged, being concentrated at one end of the ground floor, and cut off by means of a cloaks corridor, end lighted from the main hall. The corridors generally are lighted by means of borrowed lights. The class rooms are in all cases left-hand lighted. The windows of some of the class rooms to the quadrangle are somewhat small and appear to have been subordinated for architectural effect in elevation. The seating of the lecture room on the second floor is placed parallel with the length of the room, &c., and has the side desks bevelled. The arrangement shown will not be very comfortable for students occupying the side desks.

The elevations are well designed in Late Gothic influenced by a French feeling and will harmonise with the present building. The half-inch details are effective, being strongly drawn and finished in a monotint wash.

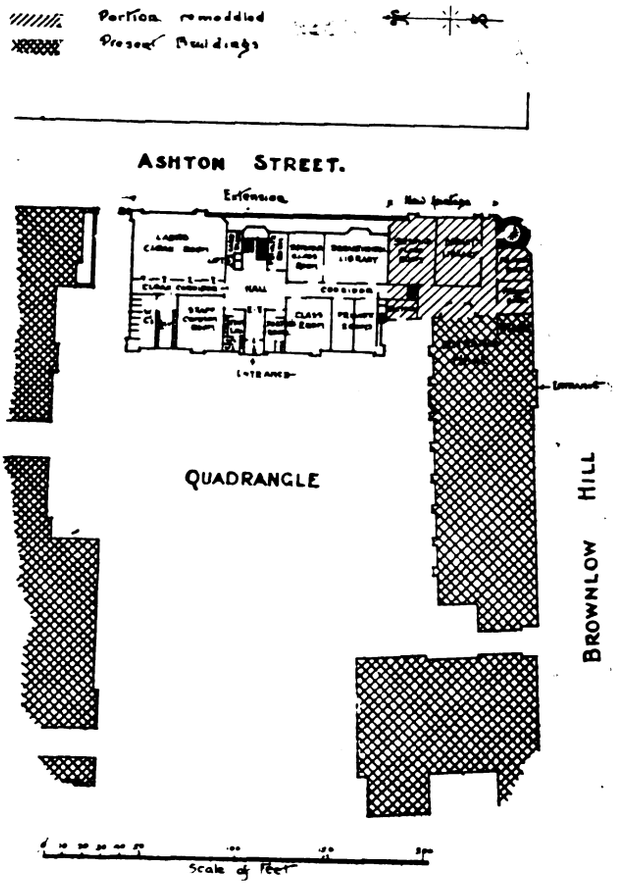
The materials proposed to be used in the elevations are grey brick with red sandstone dressings, and the cost has been based upon a cube of 598,400 feet at 10*d*. per foot, 24,950*l*.

In preparing his scheme Mr. F. W. Simon, the author of the design distinguished by a red seal, has evidently been too much influenced by the provision at some future time of a large hall in lieu of the existing arts theatre.

The placing of the entrance, entrance hall and staircase at the junction of the new with the old building conveys a feeling of lack of cohesion which is further emphasised by the dark colouring of the old portion. The corridor has the appearance of being wasteful, the line being broken by pilasters. The elevations and details look well, and are the best part of the scheme. They are treated in a severe classical manner, and are drawn in pencil, washed in with a monotint, and shaded in the modern French method. We do not understand how the style of treatment can be considered to be in keeping with the present building.

In design A, by Messrs. Willink & Thicknesse, the scheme appears to have been sacrificed by placing an entrance archway to the quadrangle in the centre of the building, and thereby disconnecting the ground floor class rooms from the entrance hall. The corridor on each floor is long and narrow and has wasteful recesses. The position of the lift is not good, and would be somewhat unsightly. The lighting of the gents' cloak room (in the basement) does not appear satisfactory, being lighted at one end by pavement lights.

The position of the drawing and map rooms in a Mansard roof would probably be unsatisfactory and lead to shadows being cast by the sides of the dormer windows. The elevations are highly coloured and show a restful building in the Græco-Roman style. Again we fail to see how this class of treatment can be said to be in harmony with the existing building. The half-inch details are carefully pencilled in and laboured in finish. The ultimate result hardly warrants the amount of time which must have been spent on the drawings. A word of appreciation is due to the authors for the sketch perspectives which accompany the scheme.



PLAN OF MESSRS. BRIGGS, WOLSTENHOLME & THORNLEY'S DESIGN.

The design under motto "Arts," by Mr. J. F. Doyle, is marred by the insignificant entrance placed at the end of the building. The ladies' cloak room accommodation is not sufficient, nor is it isolated, and has ranges of w.c.'s on inside walls. The lecture theatres are right-hand lighted, and sufficient thought does not appear to have been given to the lighting and seating of the class rooms in general. The elevations follow the style of the present building.

The scheme appears to have been hurriedly prepared, and the drawings are not so complete as those prepared by the other competitors.

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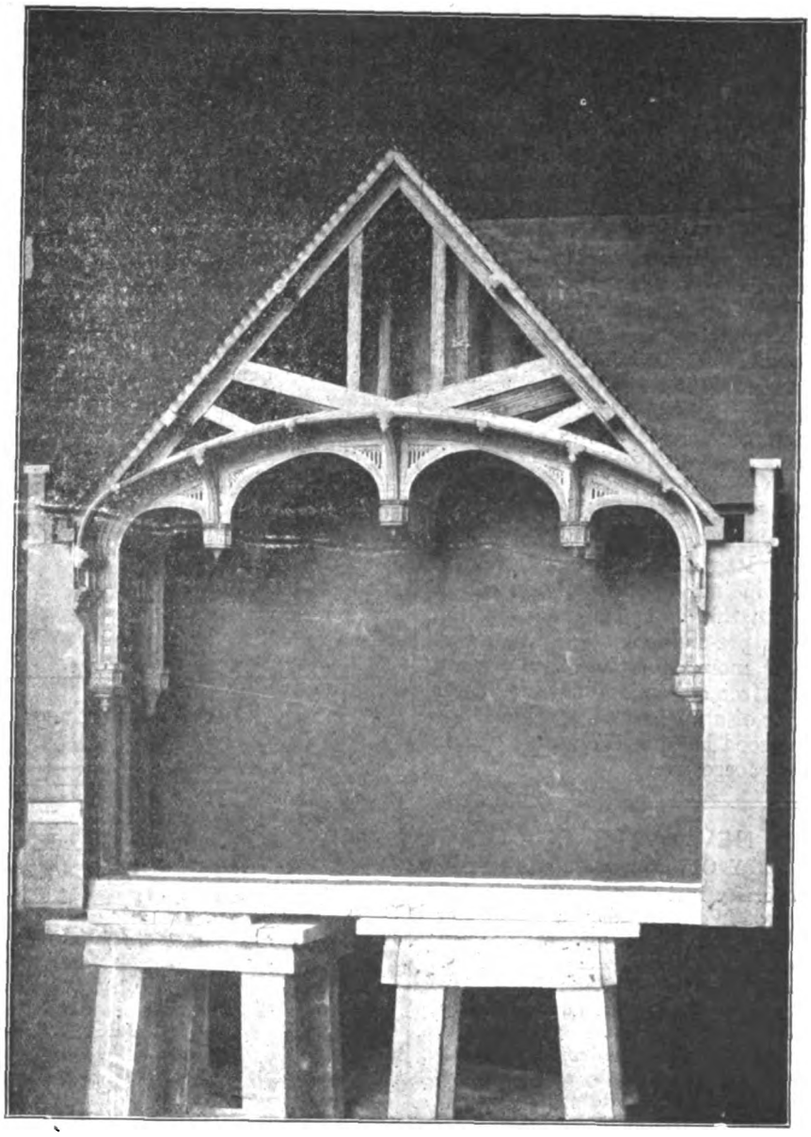


Fig. 1.—MODEL OF CROSBY HALL ROOF.

THE TRADES TRAINING SCHOOLS, LONDON.

THE report of the judges on the work done during the session 1908-1909 at the Trades Training Schools of the Worshipful Companies of Carpenters, Joiners, Painter Stainers, Plaisterers, Tylers and Bricklayers, and Wheelwrights has recently been issued, and affords us an opportunity for a short review of the excellent work that has now been carried on for fifteen years in these schools at Great Titchfield Street, London, during which some 4,000 workmen have had the knowledge of their craft increased by the instruction they have received in the schools.

The first point that should be noted is that these schools are open only to those engaged in the trade for which the classes are held; they are not for amateurs, but for actual craftsmen, apprentices, or improvers, whether carpenters, handrailers, joiners, masons, painters, plumbers, smiths, stone-carvers, modellers from the life, tilers and bricklayers, wheelwrights, wood-carvers, electric wiremen. The schools are maintained at the cost of the Worshipful Companies of the City of London mentioned above, as the moderate fees charged, which appear to be as a rule 5*s*. a term for adults and 3*s*. for apprentices and improvers, cannot be expected to meet all costs.

High quality in the character of the technical instruction given is apparent from the recognition obtained by two of the instructors at the Royal Academy, where both Mr. A. Broadbent, instructor of the classes for modellers, sculptors, and architectural carvers in marble, stone, &c., and Mr. Charles L. Hartwell, S.B.S., instructor of the life class, are exhibitors, the latter having had two of his works purchased under the terms of the Chantrey bequest. The quality of the work produced by the students is evidence that the other instructors are of equal calibre with the two we have mentioned, and by the courtesy of Mr. H. Phillips Fletcher, F.R.I.B.A., the Director of the Schools, we are able to illustrate some of this—a model of the roof of Crosby Hall (Fig. 1), made from measured drawings by Mr. A. C. Goulder, A.R.I.B.A.; a brick font (Fig. 2), some of the work of the modelling, sculpture, and stone-carving class (Fig. 3), and some of the work of the wood-carving class (Fig. 4). One point about the methods of the schools appears to us somewhat questionable. Design is not taught, and with this we agree, as the avowed object of the schools is instruction in operative craftsmanship, but the students are to a large extent allowed to make their own designs for what they execute. No doubt this adds to the interest of the men in their work, and as this is in the nature of overtime or recreation, possibly something must be conceded, but the result is that the students often spend their time on badly designed creations and may possibly be led to think that they can design. It would be a fine ideal for the Trades Training Schools to raise up a class of craftsmen equal in ability to those who worked for Sir

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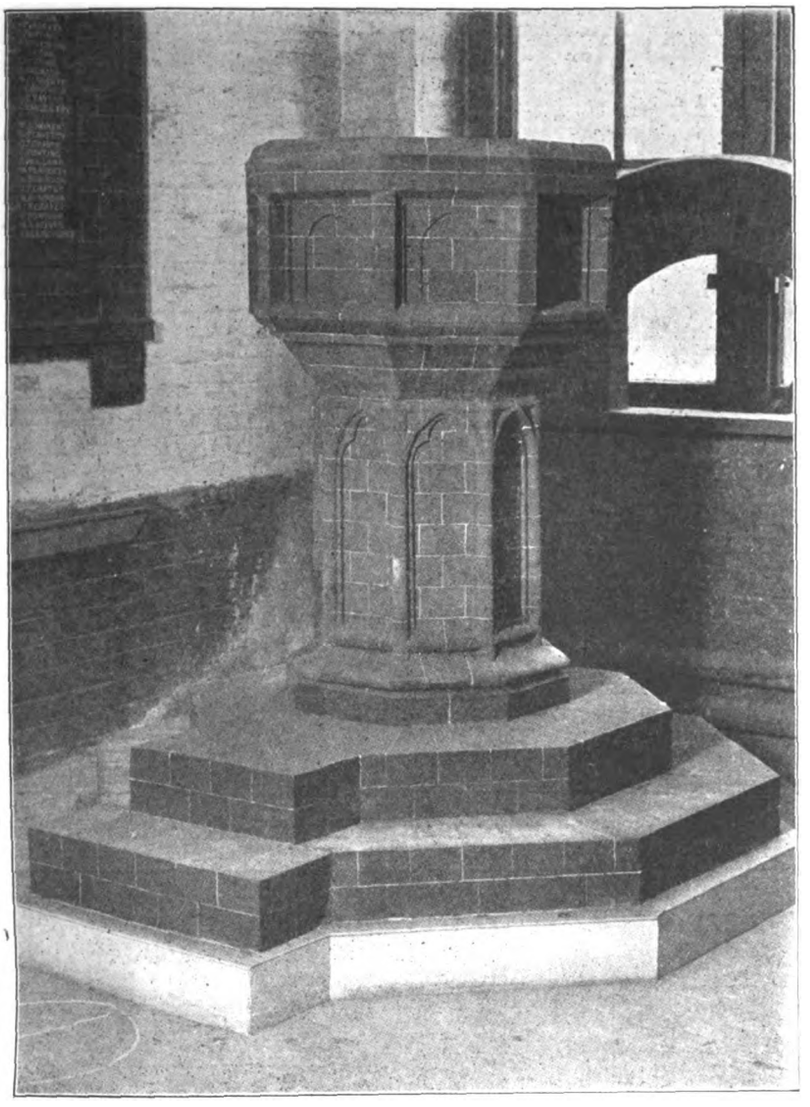


Fig. 2.—A BRICK FONT.

Christopher Wren, but it is an ideal difficult of attainment, and cannot be reached by letting the students do what they like. Thus, when we see bad grammar in design, as in the brick font, we must recognise that the Instructors and the Director of the Schools are in a difficult position.

The list of judges who examine the students' productions contains some well-known names, as Sir William Henry White, K.C.B., Sir Guilford Molesworth, K.C.I.E., Mr. Ernest George, Mr. Walter Cave, Sir George Frampton, R.A., Mr. Seymour Lucas, R.A., Mr. W. Goscombe John, R.A., Mr. Banister F. Fletcher, Mr. A. W. S. Cross, Mr. Mervyn E. Macartney, Professor Elsey Smith, and to show what they think of the work done during the past year we give the following extracts from their report:—

Carpenters.—The work of nineteen students is exhibited and the general standard of craftsmanship seems exceptionally high. The roof of Crosby Hall, by W. H. Gale, has been shown as a model with remarkable success, and has gained the Banister Fletcher medal for the best craftsman in the school, and there are two exhibits of domes, together with a circular bay, showing a good knowledge of geometrical setting out as well as excellent workmanship.

The more straightforward work consists of models of floors, joints, &c., and shows good and accurate preparation and fitting, and the amount of work exhibited by individual students points to serious application throughout the session. The judges are very satisfied with the work of the class as a whole.

Joiners and Handrailing.— The attendances this year have not been so numerous as usual, nor is the number of exhibits so satisfactory. Some of the models submitted, however, are excellent.

The oak pulpit, by R. J. Holley, is a very fine piece of work, entailing considerable skill in setting out and execution.

Handrailing.—There are several good specimens of handrailing in progress, but the judges would be glad to see more exhibits completed.

Masons.—The workmanship shown this year is satisfactory, and although there are not many completed models, the judges are pleased to see that the students are being well grounded in the simpler forms of masonry.

They hope that something a little more ambitious may be attempted in the future, and that the models will be more numerous.

Painters.—A number of very creditable specimens of decorative painting and sign writing have been produced during this session, and the judges consider that the traditional excellence of the class has been well maintained.

Plasterers.—The work executed in this class is a distinct advance on previous years, some of the models showing considerable promise. The judges were especially pleased with the careful examples of piece moulding by G. Davies, in which the actual clay model and moulds were shown.

Plumbers.—The number of exhibits this year, together with the general craftsmanship, is most gratifying, and testifies to the excellent method of instruction given.

Smiths.—The judges regret that more works have not been completed, but consider this due to the ambitious designs attempted. The welding and repoussé work is of a first-rate quality, and reflects great credit upon the class as a whole.

Stone-Carvers.—The judges were very gratified at the great progress made this year, there being considerably more

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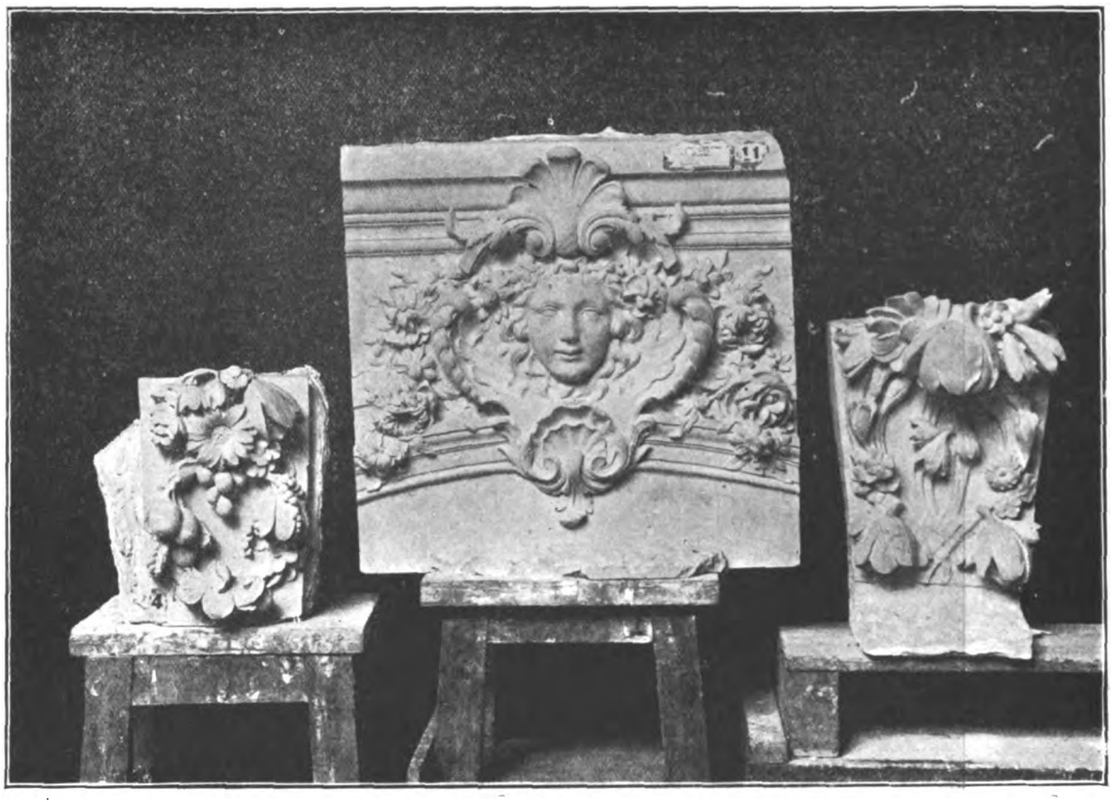


Fig. 3.—SCULPTURE AND STONE CARVING.

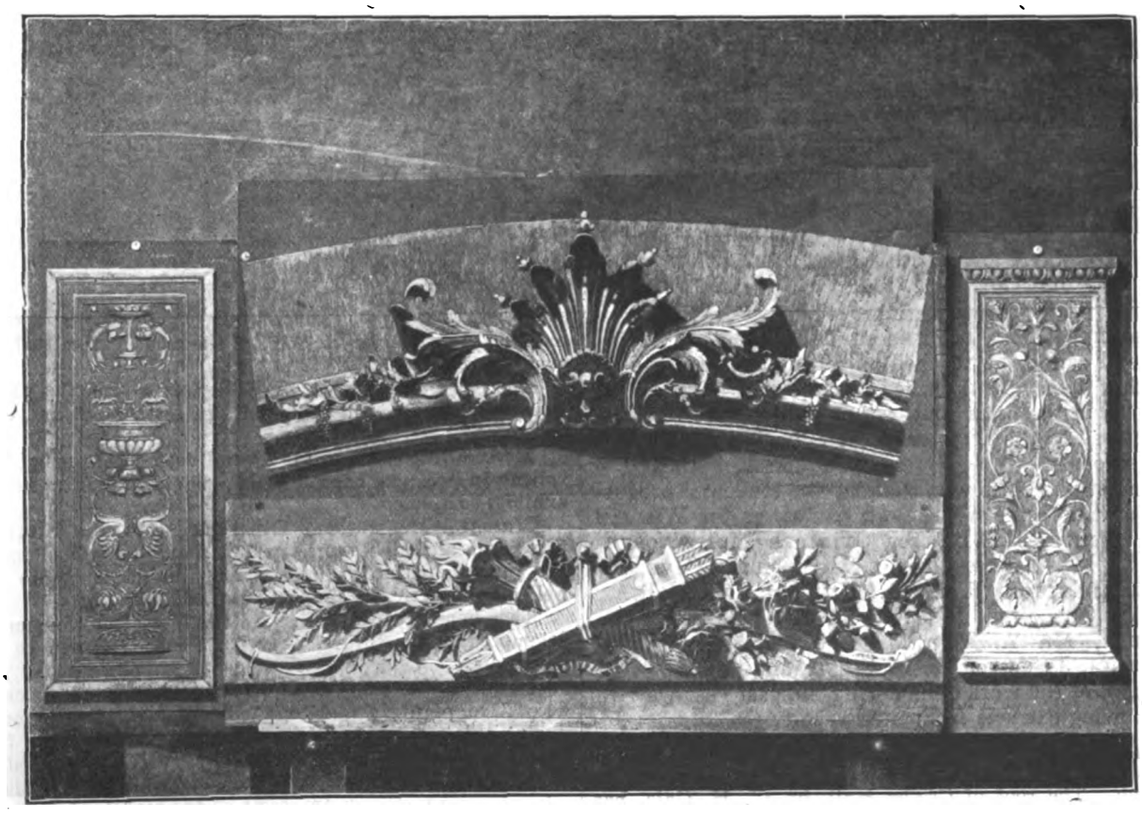


Fig. 4.—WOOD CARVING.

work done than in any previous session. The exhibits shown are quite a departure from hackneyed examples. Many of the students have used as *motifs* features of buildings recently erected.

Life Class.—Sir George Frampton, R.A., Messrs. Goscombe John, R.A., Banister Fletcher, and J. Hutton Freeman consider that the studies submitted to them are even better than last year, and again prove the advantage of instruction by means of quick studies which has been adopted.

Tylers and Bricklayers.—The specimens of cut brickwork exhibited are of exceptional merit, and the judges were struck by the working drawings, which evince a practical acquaintance with the work of the trade. The fine example of a cut brick font, executed by R. Fever, is decidedly unique, and illustrates the way in which the material may be used. He was a close competitor for the Banister Fletcher medal.

Wheelwrights.—The exhibits, although fewer in number than usual, are of considerable merit and show much care.

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Wood-Carvers.—The judges are glad to see that a very good standard is maintained in this class, and they appreciate very much the skilful drawings that have been exhibited. They would like to see a little more wood-carving, and also think it desirable that the models should be presented with architectural surroundings when possible, and that the original sketches for the design should be exhibited. They would recommend that models of good architectural features should be added to this class.

Electric Wiremen's Work.—The judges were pleased to note that this class has met with success, as, although it was only initiated at the end of 1908, some very excellent examples of wiring for electric light, bells, and telephones have been installed. It is difficult to differentiate between the students, as such work is necessarily of a joint nature.

CONCRETE REINFORCED BY NAILS.*

THE paragraph in our last issue under "Our Contemporaries from Over-Seas," on the paper in *The Engineering Record,* has excited considerable interest amongst our readers, and we therefore reproduce the report from our contemporary:—

Concrete reinforced by metal to sustain tensile stresses produced by flexure has been investigated most fully in all its possibilities during the last twenty years. The strength of reinforced concrete in compression, both direct and due to flexure, has also received much attention more recently. By the very character of concrete, which has a tensile and shearing resistance many times lower than its compressive strength, and on account of the possibility of reinforcing this material in one direction or another, it lends itself most readily to experimental research in several directions, such as the effect of lateral restraint or enhanced shearing resistance. It is true that concrete is not a sufficiently homogeneous material to afford exact experimental data which could be utilised in comparative studies to a nicety. But for structural materials and engineering purposes it is important to obtain even gross experimental results and, in many cases, such information is sufficient.

Such gross results will be presented in the following notes on the compressive resistance of concrete cubes reinforced by wire nails. The writer claims a fairly extensive acquaintance with the literature of reinforced concrete and he does not recollect to have encountered mention of tests made on concrete reinforced in this manner.

That no attention was paid to increasing the compressive resistance of concrete by the embedding of wire nails, cut wire, nuts, and similar material, is not surprising because it is, on its face, very uneconomical and does not promise commercial success. Wherever such means of reinforcing may have occasionally been used, it probably has not been considered important enough to make a series of tests which would be worth while recording. The great compressive strength that can be developed in concrete reinforced in this way must have remained entirely undisclosed.

The occasion which led to the series of tests described in this paper arose from conditions requiring the use of an initially plastic material which should fill certain spaces, harden to an imperishable state, and develop within a comparatively short time great compressive resistance without sustaining much deformation.

Some time ago it was deemed advisable to fill the compartments of a large steel casting with a material as described above. This casting formed a pedestal of an important bridge being constructed by the Department of Bridges of the City of New York. Mr. C. M. Ingersoll, consulting engineer, suggested the use of concrete reinforced by wire nails or cut wire, and ordered tests of this material to be made by the Cement Testing Bureau of the department. The results of these tests were so satisfactory that the mixture was adopted for the filling.

Altogether 75 test cubes were made, 60 of which were broken, the remaining 15 being left for age tests. Those broken consisted of 57 specimens reinforced by wire nails, one by cut wire, and two by scrap iron consisting of nuts, nails and clippings. Of those reinforced by wire nails 55 were 6-inch cubes and two 12-inch cubes. These were the only 12-inch cubes, the remaining specimens being all 6 inches.

Several standard brands of Portland cement were used in the making of the cubes but no separation of the results with respect to the brands has been made in this paper. The cubes were made of a cement and sand mortar and standard eightpenny wire nails, 0.1 inch in diameter and 2½ inches long. In all but two cubes the proportions of the mortar were 1 to 2. The aggregates were proportioned by weight as follows: 4 lb. and 2 oz. of Portland cement, 8 lb. and 4 oz. of sand, and 11 lb. of wire nails.

The cement and sand were first mixed dry, and about 12 per cent. of water was then added, making a fairly stiff mortar. The nails were then added and mixed with a trowel in the usual way, the same as for broken stone concrete. They were slightly wetted before mixing. The concrete was then placed in the forms in layers of about 1 inch and tamped. The upper surface was finished with 1 to 2 mortar. The forms were removed in about 48 hours. They were then kept in the

* A paper read before the recent Convention of the American Society for Testing Materials by Leon S. Moisseiff.

Crushing Strength of 6-inch Cubes of Wire-Nail Concrete in Pounds per Square Inch.

—	Seven Days.	One Month.	One and a third Months.	Two Months.	Two and a half Months.	Three Months.	Seven and a half Months.	Eight Months.	One Year.	Thirteen Months.	Fifteen Months.	Eighteen Months.
1	2,890	5,760	7,220	6,220	*d* 6,110	9,450	*c* 13,890	*b* 15,300	10,550	*a* 14,450	17,800	13,050
2	3,000	5,720	5,610	6,450	—	8,340	—	*b* 15,300	11,100	*a* 8,900	16,670	—
3	3,050	6,000	7,560	6,550	—	8,340	—	—	10,550	—	—	—
4	3,165	5,280	6,280	6,670	—	—	—	—	9,440	—	—	—
5	2,890	5,550	—	—	—	—	—	—	—	—	—	—
6	3,050	6,280	—	—	—	—	—	—	—	—	—	—
7	2,770	5,280	—	—	—	—	—	—	—	—	—	—
8	3,000	4,500	—	—	—	—	—	—	—	—	—	—
9	3,050	5,890	—	—	—	—	—	—	—	—	—	—
10	3,000	7,000	—	—	—	—	—	—	—	—	—	—
11	2,890	5,550	—	—	—	—	—	—	—	—	—	—
12	3,050	5,000	—	—	—	—	—	—	—	—	—	—
13	3,330	8,340	—	—	—	—	—	—	—	—	—	—
14	3,050	3,050?	—	—	—	—	—	—	—	—	—	—
15	2,770	5,550	—	—	—	—	—	—	—	—	—	—
16	2,890	5,550	—	—	—	—	—	—	—	—	—	—
17	3,330	—	—	—	—	—	—	—	—	—	—	—
Maximum	3,330	8,340	7,560	6,670	6,110	9,450	13,890	15,300	11,100	14,450	17,800	13,050
Minimum	2,770	(?)3,050	5,610	6,220	—	8,340	—	15,300	9,440	8,900	16,670	—
Average	3,010	5,645	6,668	6,473	—	8,710	—	15,300	10,410	11,675	17,235	—

a = 1:1½ and 11 pounds wire nails. *b* = 12-inch cubes; 1:2 and 110 pounds wire nails. Unbroken; capacity of machine exceeded. *c* = 1:2 and 88 pounds wire nails, same proportion as 6-inch cubes. *d* = nails laid in courses.

Special 6-inch Cubes.

I. Cut wire, ⅛ inch diameter, 1½ inch long, filled with 1:2 grout, 7 days = 1,945 pounds per square inch.
II. Scrap iron (nuts, nails, clippings, &c.) with 1:2 grout . . 7 days = 2,221 " "
III. " " " " " . 28 days = 3,050 " "

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air and wetted daily by sprinkling until used. The weight of the concrete so made was 196 lb. per cubic foot. The cubes looked smooth on the outside the same as plain concrete cubes, except for light brown spots, showing discoloration of the concrete by the embedded nails wherever the latter were exposed.

The accompanying table contains the results of all the tests, tabulated as to age of specimens, and the average, minimum and maximum resistances of each group. As seen from the table there are 12 such groups varying in age from one week to eighteen months.

The tests were made in a hydraulic press of 350 tons capacity, and the pressure was read off a pressure dial. The accuracy of the machine was within 3 per cent. In the case of the 12-inch cubes an 1,100-ton machine was used. The pressure was applied as slowly and as gradually as such machines will permit. The first indication of noticeable deformation was given by the flaking off of the sides, exposing the embedded nails. This may be termed the elastic limit, but it was not recorded in all cases. Where recorded, the elastic limit varied between 60 to 80 per cent. of the ultimate strength.

The crushing strength was considered to be attained when the deformation became excessive. After this point was reached the cube was rapidly squeezed without any increase in pressure—on the contrary, the pressure could be much decreased. When the squeezing was carried sufficiently far the cube would break apart when removed from the machine and dropped on the floor.

The results of the tests as tabulated speak for themselves. Little can be added in discussing them. The most striking fact is that a greatest resistance of 17,800 lb. per square inch was obtained on a cube fifteen months old, a figure unheard of in reinforced concrete testing. That this figure is not accidental is borne out by the fact that the companion test cube developed a resistance of 16,670 lb. per square inch, and that two 12-inch cubes, reinforced by 25 per cent. more nails than the other cubes, attained in eight months a resistance of 15,300 lb. per square inch without failure, the limit of the largest machine having been used.

The most important phenomena developed are, however, the comparatively high resistances obtained within seven days and one month, and the small variations in the strength of the various cubes at the age of seven days. The average compressive strength, as will be seen from the table, developed by 17 cubes was 3,010 lb. per square inch, with a minimum value of 2,770 lb. and a maximum of 3,330 lb., or about 10 per cent. either way. The average strength of 16 cubes at the age of one month reached 5,645 lb. per square inch, an increase of 88 per cent. in three weeks. The growing strength of the cubes with their age can be plainly seen from the table.

The cube reinforced by cut wire, instead of wire nails, failed at the age of seven days at 1,945 lb. per square inch, or under a pressure of only two-thirds of that of the wire nail cubes. The two scrap-iron cubes, while somewhat stronger, did not make a better showing.

From the proportion of wire nails used the high cost of such concrete is at once apparent. Eighty-eight pounds per cubic foot of concrete, or 18 per cent. by volume is certainly expensive reinforcing. The cost of concrete so reinforced will be about $2.30 per cubic foot, and the high cost precludes its use to any considerable extent. There are, however, many instances where a material which combines so high a compressive resistance with the advantages of concrete will find its applications. Thus, for instance, where column footings are to be raised or the foundation has settled, it might be found very convenient to utilise concrete reinforced by nails to fill the spaces. The plasticity of the material which can be made to fill all kinds of spaces, and the great strength developed in seven days will, in many cases, be of sufficient advantage to cause its adoption.

Aside from the practical considerations of utilisation, the tests described in this paper have a theoretical bearing. They illustrate in an extreme manner how the compressive strength of a material may be increased by reinforcing its shearing resistance. The nails actually reinforce the shearing planes in all possible directions, and thereby develop the high compressive resistance of the material. The tests thus shed a light on the internal stresses of a body in compression.

The Glasgow Society of Artists have decided to hold their seventh exhibition in the galleries of the Royal Glasgow Institute of Fine Arts, Sauchiehall Street, during October this year. Five new members have been elected.

ILLUSTRATIONS.

BIRMINGHAM UNIVERSITY.—ENTRANCE—DETAIL OF ENTRANCE—TESTING LABORATORY—ELECTRICAL LABORATORY—DRAWING STUDIO—A CORRIDOR.

THE main entrance to Birmingham University is in the central block, which contains the Entrance Hall and the Assembly Hall, illustrated by us last week. It is approached in a direct line from University Road; the visitor passes through one of five vaulted archways under the reading-room of the Harding Library, which occupies the centre of the main frontage, and on past the Chamberlain Tower. Above the entrance doorways are nine sculptured figures by Mr. Henry Pegram, A.R.A., representing from left to right Beethoven, Virgil, Michel Angelo, Plato, Shakespeare, Newton, Watts, Faraday and Darwin. In the spandrils of the window above are carved the arms of the neighbouring counties, with the University arms on the keystone. To the right of this main block is the electrical and civil engineering block. The main laboratory contains the various apparatus for testing the strength of materials and for hydraulic work, and most particularly the 300-ton testing machine, which is large enough to deal with built-up structural members of a practical size in tension, compression and bending. There are two electrical laboratories—that on the first floor contains the light apparatus, that on the ground floor the heavy running machinery. The general contractor for the University building was Mr. Thomas Rowbotham, and the architects were Sir Aston Webb, C.B., R.A., and E. Ingress Bell.

HOUSE ON THE LICKEY HILLS, WORCESTERSHIRE.—S.W. ELEVATION.

THIS house, the country residence of Mr. Edward Cadbury, was designed for a very hilly, exposed situation. The walls are faced with thin black country bricks with thick white joints, and the roofs covered with hand-made tiles. Messrs. J. & A. Brazier, of Bromsgrove, were the builders, and Messrs. Cossins, Peacock & Bewlay, of Birmingham, the architects.

BEACON WOOD, LICKEY HILLS, WORCESTERSHIRE.—ENTRANCE FRONT.

THIS house, the country residence of Mr. George Cadbury, jun., was built by Messrs. J. & A. Brazier, of Bromsgrove, from designs by Messrs. Cossins, Peacock & Bewlay, of Birmingham. The exterior is faced with silver-grey rough-cast, the main roof being covered with hand-made tiles. The loggia and verandah are thatched.

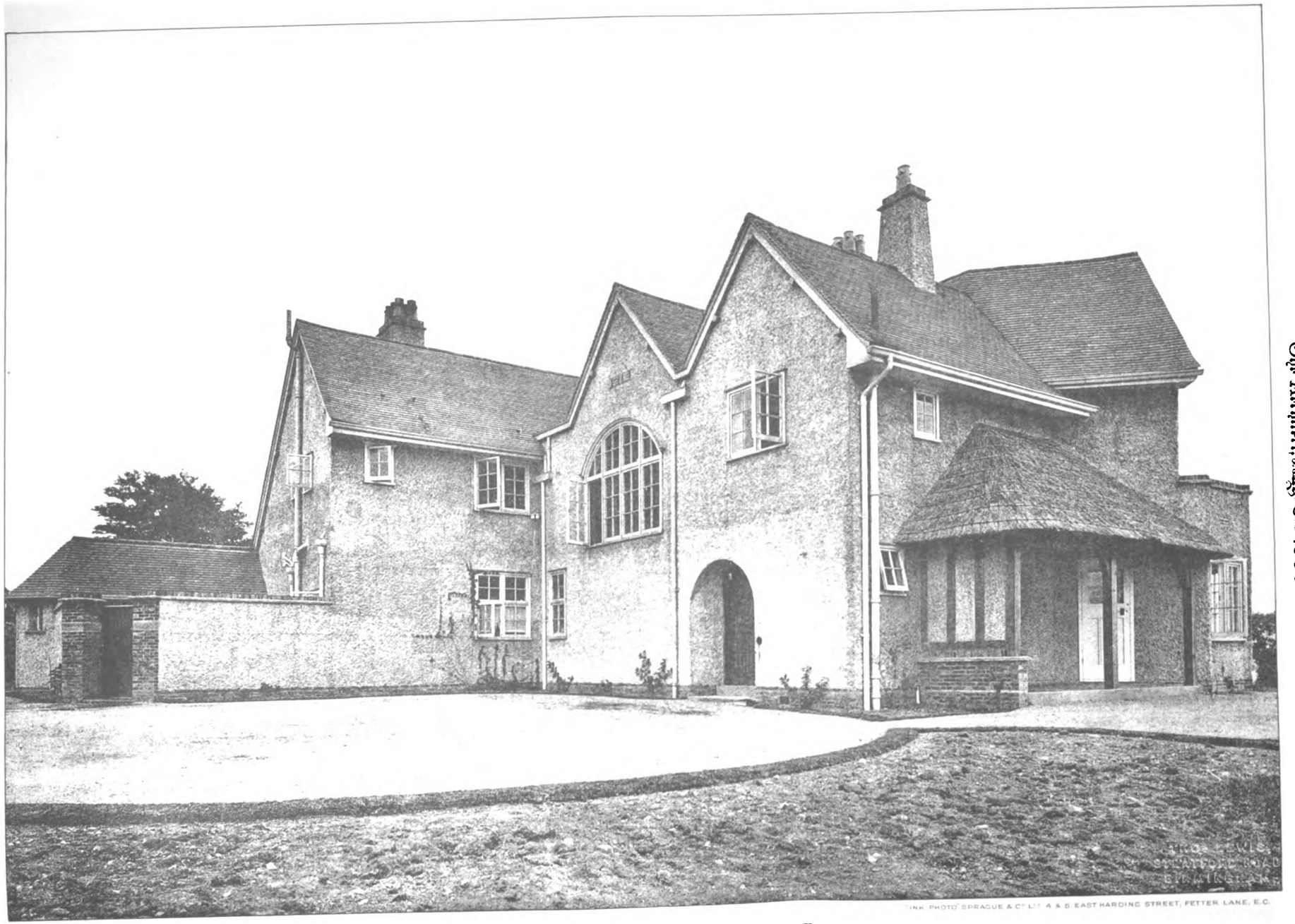
LIVING ARCHITECTS.—OXFORD COLLEGES.

WE shall continue our series of drawings by Mr. Ginsbury of "Living Architects," and also the series of illustrations of the Colleges of Oxford in September.

The Aberdeen County and Municipal Buildings Commissioners had before them at their annual meeting last week a report by Mr. William Kelly, architect, on the state of the freestone of the Old Tolbooth. Within the past ten years the masonry has begun to show signs of exfoliation, and Mr. Kelly recommended that the loose surface of the stonework be scaled off and flushed up with cement, and the whole treated with a preserving solution. The Commissioners approved of the report, the cost to be borne equally by the county and the city. The Tolbooth was erected in the early part of the seventeenth century.

The Following Results of Examinations in the Department of Architecture are published by the Sheffield University:—First Year.—First Class: John H. Odom; Second Class: George A. Booker, Henry B. Leighton. Second Year (for certificate).—First Class: John C. P. Toothill; Second Class: Harry B. S. Gibbs, Walter Noble, Stanley H. Williams. The following students in the Department of Architecture have passed the following examinations of the Royal Institute of British Architects:—Preliminary, George A. Booker; intermediate, George R. Bower; final, Herbert G. Warlow.

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"BEACON WOOD," LICKEY HILLS, WORCESTERSHIRE: ENTRANCE FRONT.

Messrs. COSSINS, PEACOCK & BEWLAY, Architects

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ENTRANCE PRINT

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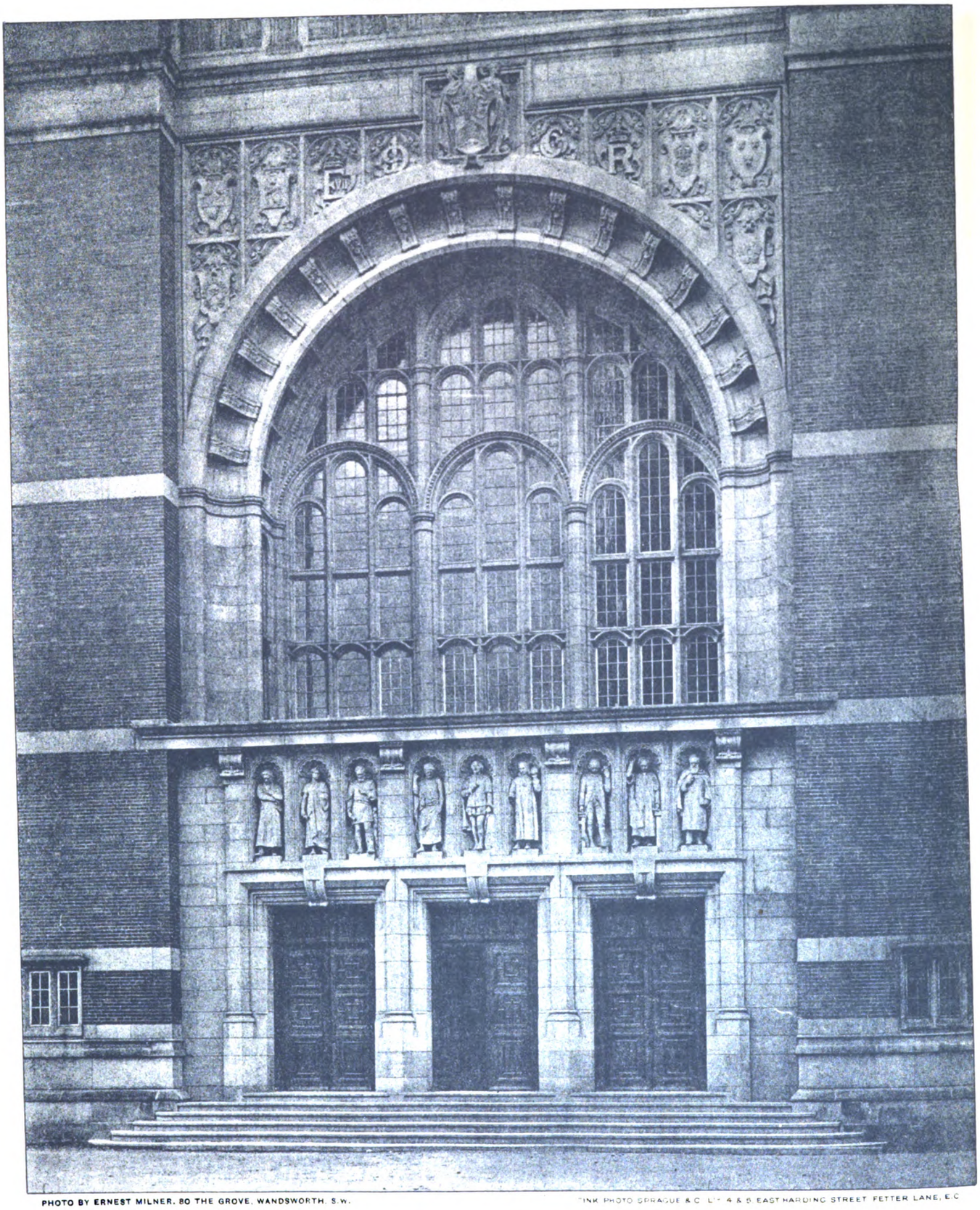


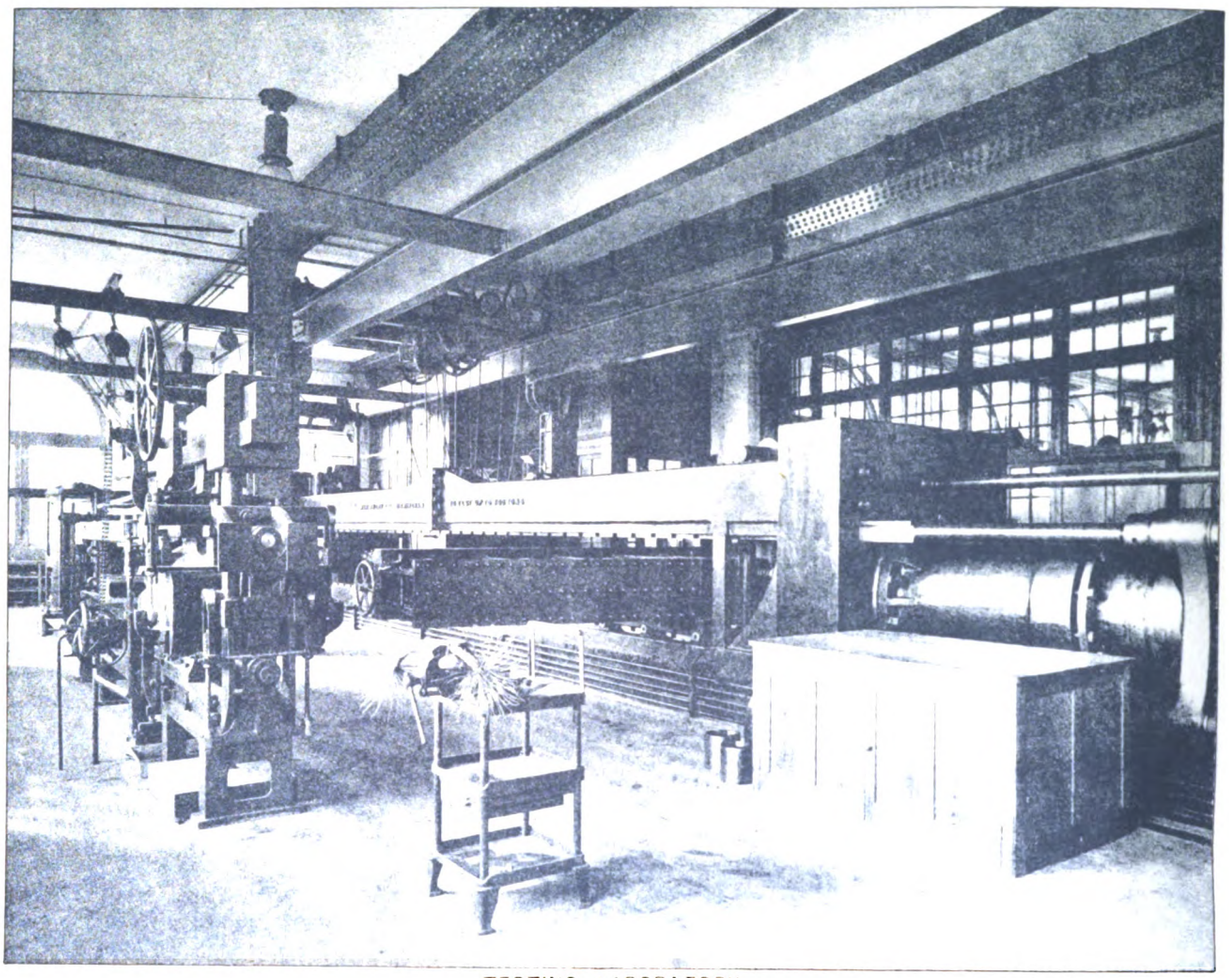
PHOTO BY ERNEST MILNER, 80 THE GROVE, WANDSWORTH, S.W. PINK PHOTO SPRAGUE & C° LTD 4 & 5 EASTHARDING STREET FETTER LANE, E.C.

BIRMINGHAM UNIVERSITY: ENTRANCE.

SIR ASTON WEBB, C.B., R.A. and E. INGRESS BELL, Architects.

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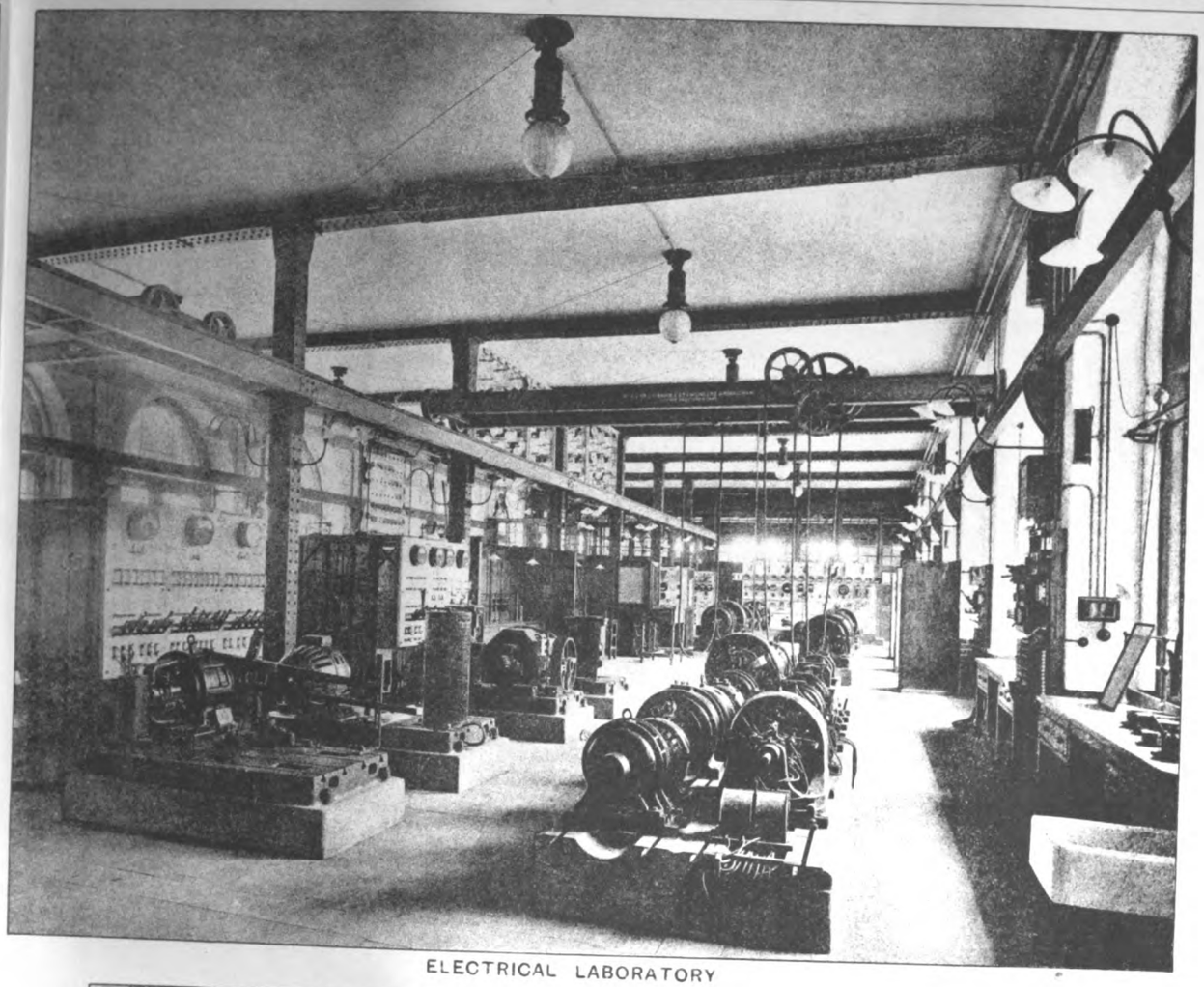
TESTING LABORATORY



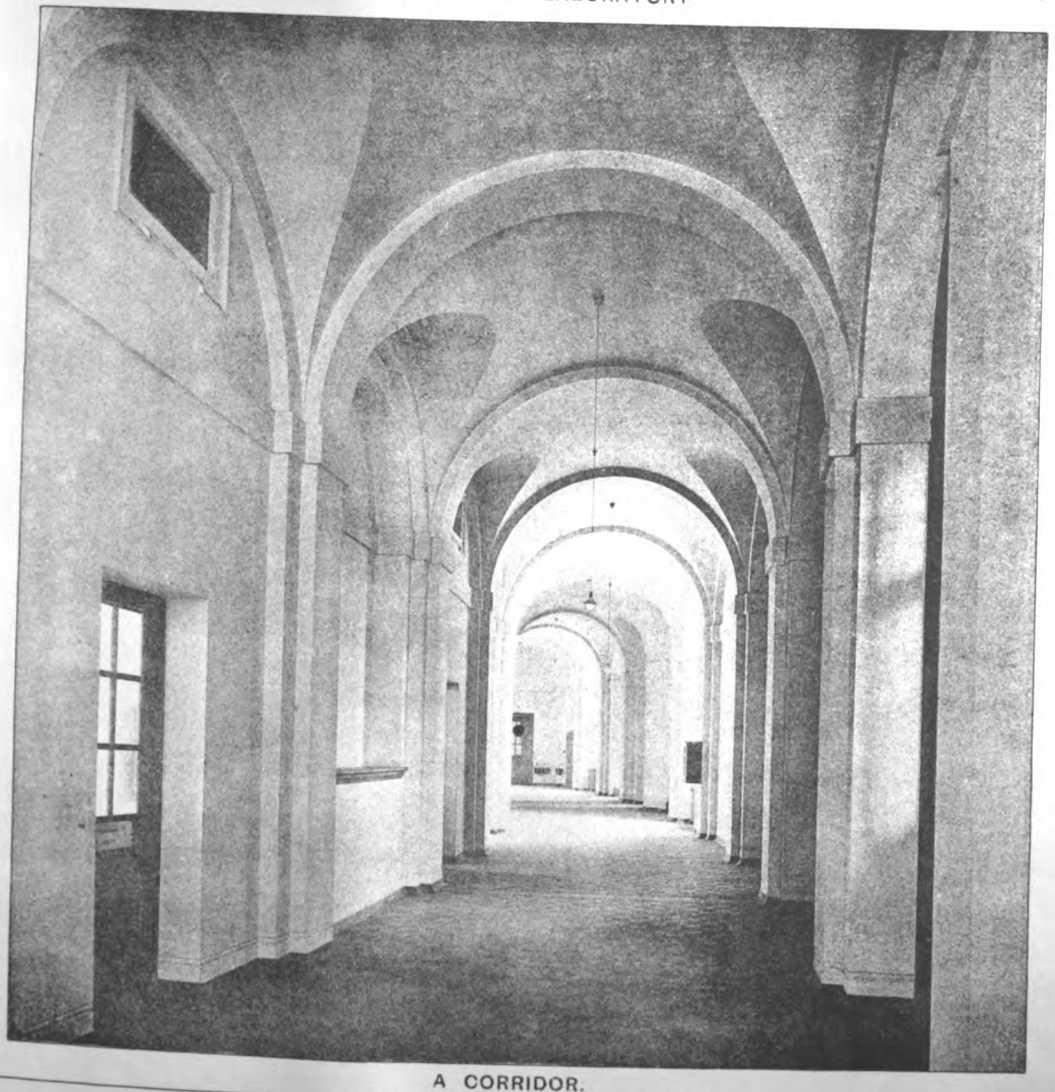
DRAWING STUDIO

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ELECTRICAL LABORATORY



A CORRIDOR.

UNIVERSITY

E INGRESS BELL. Architects.

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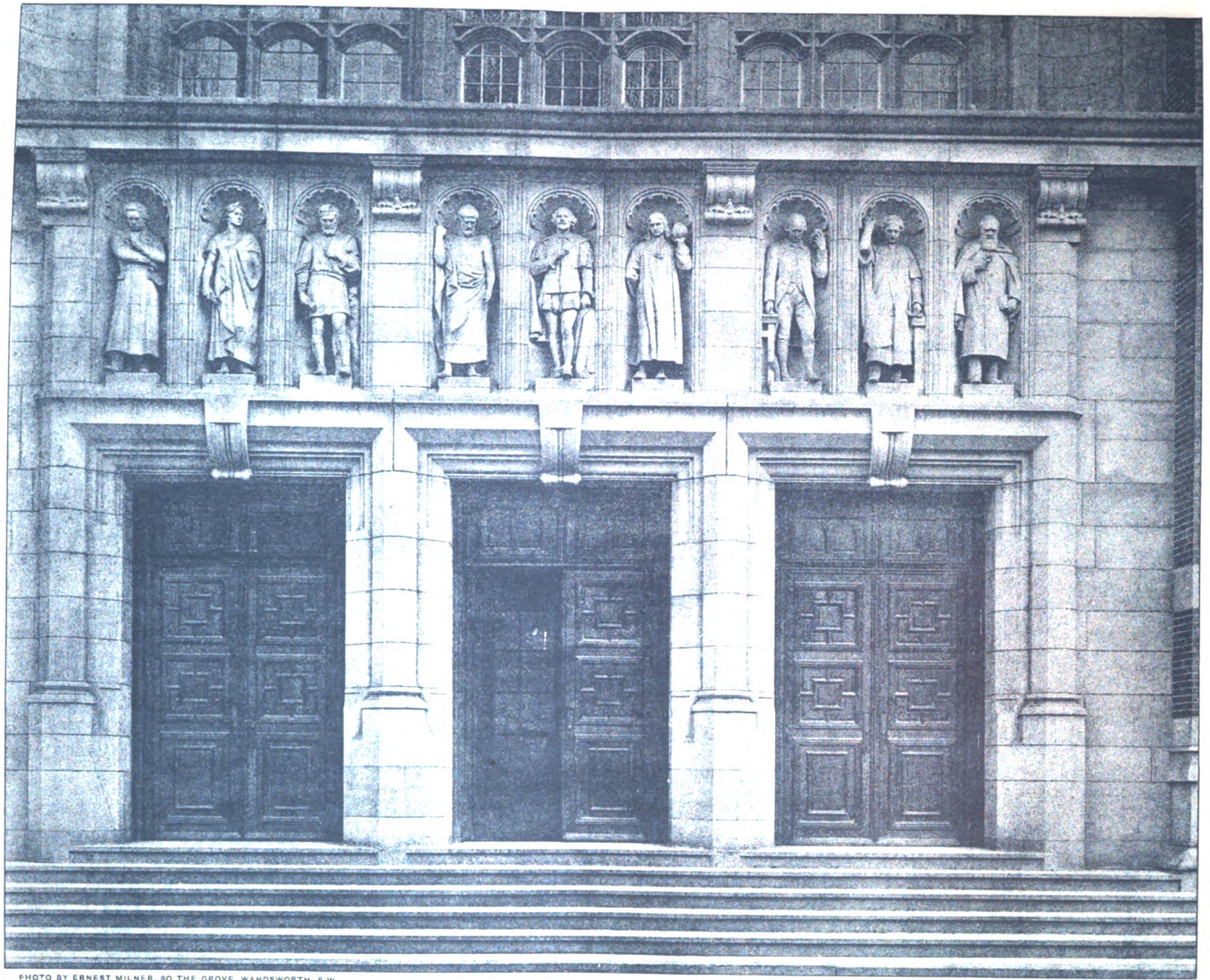


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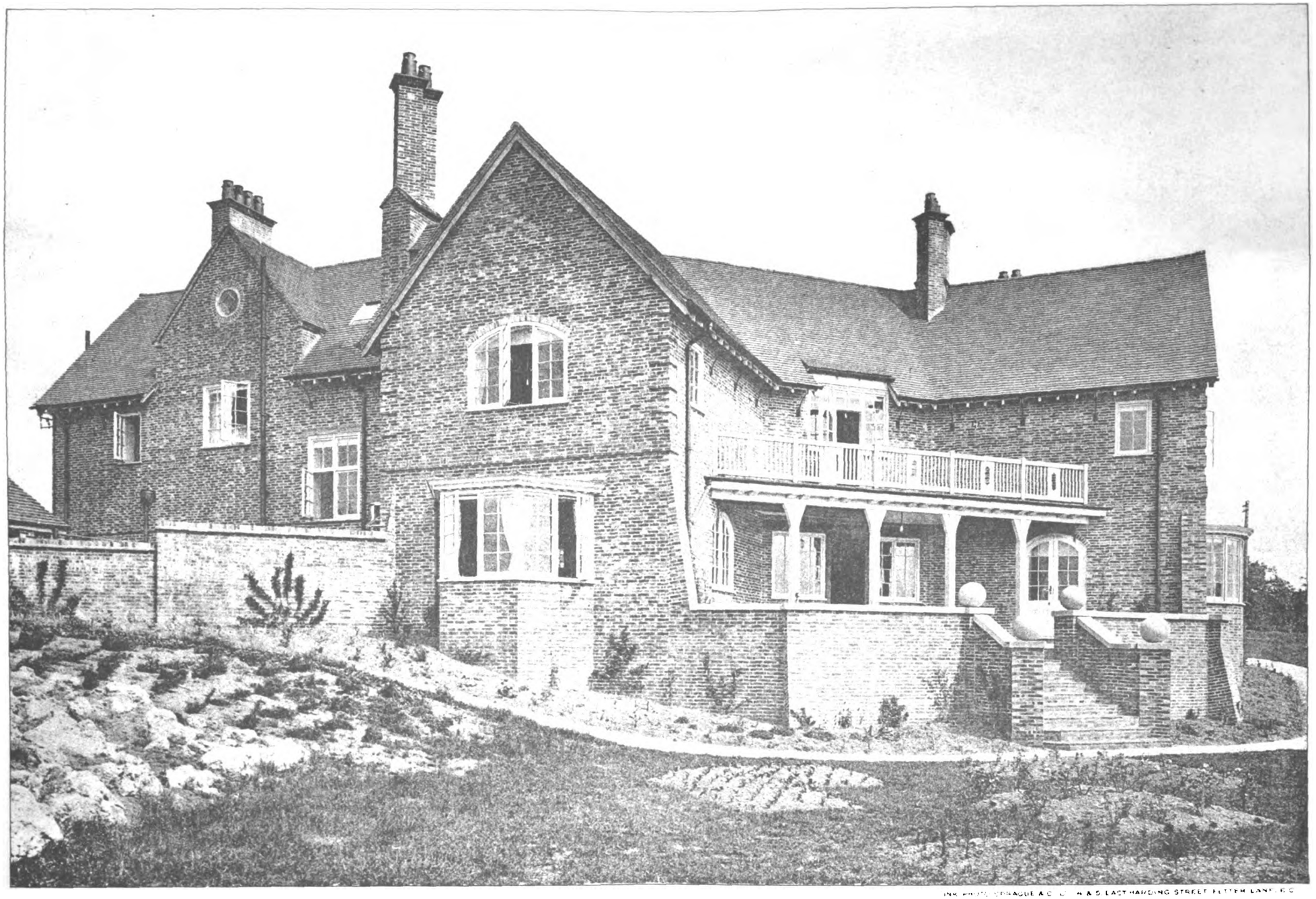
BIRMINGHAM UNIVERSITY: DETAIL OF ENTRANCE.

SIR ASTON WEBB, C.B., R.A., and E. INGRESS BELL, Architects

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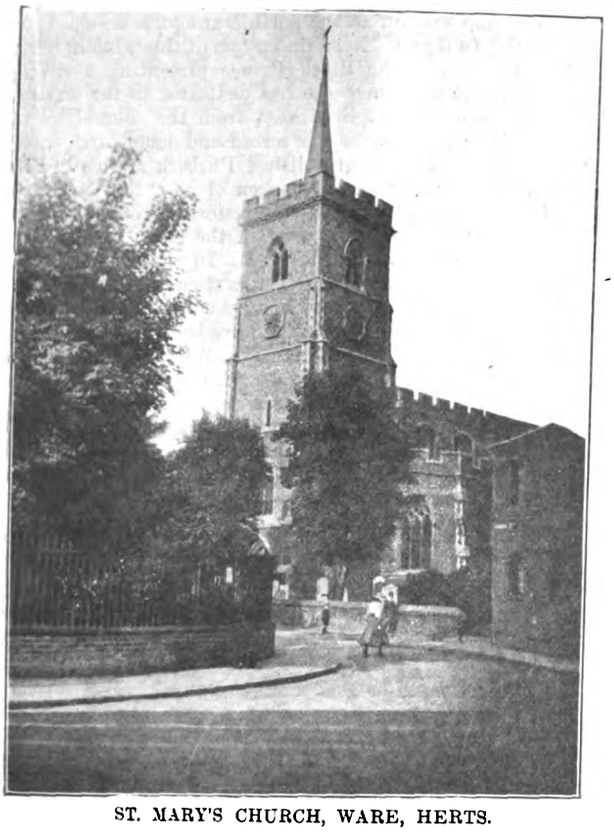


HOUSE ON THE LICKEY HILLS, WORCESTERSHIRE: S.W. ELEVATION.

Messrs. COSSINS, PEACOCK & BEWLAY, Architects.

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ST. MARY'S CHURCH, WARE, HERTS.

WARE.*

WARE, a thriving market town of Hertfordshire, derives what importance it has from the fact that it is the largest malting town in England. The number of malt-houses (about eighty) is its most noticeable feature, and we are told that when malt was taxed the amount collected one year was as much as 200,000*l.* Ware is of considerable antiquity, having been known to the Romans, their Ermine Street crossing the Lea a little above the town. At that time Hertfordshire formed part of the Roman province of Flavia Cæsarensis, but on the conquest of England by the Anglo-Saxons the county was merged partly in Mercia and partly in Essex. Roman remains have been found at different times in the vicinity of the town.

In the year 896 A.D. history relates that the Danes brought their war vessels up the Lea, anchored them near Ware, and laid siege to Hertford. The people of London attacked their encampment but were repulsed, and the following year King Alfred the Great commenced operations against them. He is said to have constructed fortifications and set men to work to divert the stream, in order to prevent the Danes from bringing out their ships. The Danes, finding their vessels stranded, abandoned them and retreated to the West of England. The precise locality of the Danish camp is uncertain, but it was somewhere between Ware and Hertford, and it is not clearly known what was the exact nature of the operations conducted by Alfred.

In Domesday the name of the town is given as "Waras," but in other old writings it has the name of "Gware" and "Gwaris." Cussans says:—"It is probable that the name of this town may have been derived from the weir built across the Lea at this place on the invasion of the Danes. This at least is the popular account, unsupported, however, by any positive evidence. Stowe says the town was built as early as the year 941. It must, however, have been for many years an inconsiderable village, for at the time of the compilation of Domesday it contained less than 120 inhabitants, including serfs, and was only worth 45*l.*"

The translation of Domesday given in the recently published "Victoria History of Hertfordshire" runs as follows:—"In Brachinges [Braughing] Hundret Hugh de Grentmaisnil holds in Waras [Ware] 24 hides. There is land for 38 ploughs. In the demesne there are 13 hides, and on it are 3 ploughs. There could be 3 more. There are 38 villeins and (cum) a priest and the reeve of the ville, and (cum) 3 Frenchmen and 2 Englishmen have 26 ploughs and a half plough. There are 27 bordars and 12 cottars and 9 serfs. Under the Frenchmen and the Englishmen are 32 men between villeins and bordars. There are 2 mills worth 24 shillings and 400 eels less 25; and other men have 3 mills producing 10 shillings yearly. Meadow is there sufficient for 20 plough teams. Woodland to feed 400 swine. There is an enclosure for beasts of the chase, and 4 arpents [about 12 acres] of vineyard just planted. The total value is 45 pounds; when received it was 50 pounds; T.R.E. [in the time of Edward the Confessor] also 50. This manor Anschil of Waras [Ware] held, and 1 sokeman, his man, had there 3 hides, and another sokeman, Earl Guert's [Harold's brother Gyrth] man held half a hide. Either could sell. These two, after King William came, were attached to this manor. They did not belong to it in King Edward's time—so the shire moot testifies."

Hugh de Grentmaisnil was a follower of William the Conqueror, and in return for his services large grants of land were bestowed upon him. The manor of Ware remained in his family till near the close of the twelfth century, when it passed by the marriage of his great-granddaughter to the Earl of Leicester. It subsequently passed to Saher de Quincy, Earl of Winchester. He freed the town from the toll levied by the Corporation of Hertford on all traffic by horses or carts crossing the bridge, by breaking the great iron chain which was put across the bridge to prevent a road here to the disadvantage of Hertford. Saher is said to have informed the bailiff of Hertford, who had the keys, that if he were dissatisfied or raised any objection he should follow the chain over the side of the bridge. The trade of the town was greatly increased by the freeing of the bridge, but the tolls were subsequently re-imposed. They were granted by Charles I. to William, Earl of Salisbury, and they continued to be collected from non-resident traders till 1900, when the bridge was entirely freed. Saher set out for the Holy Land in 1219, but died on the way. His son gave the manor to his younger brother, Robert de Quincy, who obtained the right to hold a fair of five days' duration during the Feast of the Nativity of the Virgin. Later (1262) the manor passed by marriage to Baldwin Wake, and in the reign of Edward III. to Sir Thomas Holland, afterwards Earl of Kent, in whose family it remained till carried by an heiress (1409) to Thomas de Montacute, Earl of Salisbury. Subsequently it came into the possession of the famous Richard Neville, Earl of Warwick, known as the "Kingmaker," who was killed at the Battle of Barnet. When Warwick's estates were forfeited this and other manors were bestowed upon King Edward IV.'s brother George, Duke of Clarence, who was subsequently attainted, and is said to have been drowned in a butt of Malmesbury while imprisoned in the Tower. On the duke's death the manor came into the possession of Richard Duke of Gloucester, who subsequently became King of England. On his death on Bosworth Field (1485) it was settled on Margaret, Countess of Richmond, the mother of Henry VII. On her decease it was granted to Margaret, daughter of the Duke of Clarence, who had previously married Sir Richard de la Pole, and was mother of Cardinal Pole. This lady subsequently became Countess of Salisbury, and when 70 years of age was accused of favouring the old religion and was sentenced to death, without even the ceremony of a trial, and beheaded in 1541 in the Tower. With her the noble and illustrious House of Plantagenet became extinct. On the accession of Queen Mary she restored the manor to the grand-daughters of the Countess of Salisbury, and one of them, Katherine, sold it, about 1570, to Sir Thomas Fanshawe, Queen's Remembrancer of the Exchequer. He was succeeded by his eldest son, Sir Thomas Fanshawe, who was appointed ambassador to the Court of Spain, and afterwards filled the posts of Secretary for War and Treasurer of the Navy. He died at Madrid in 1666, whither he had been sent by Charles II. as Envoy to Portugal and Spain, but his remains were brought to England and deposited in All Hallows (All Saints') Church, Hertford. They were finally buried in a vault under St. Mary's Chapel, Ware, in May 1671. The second viscount was the last of the family who possessed the manor, for he was compelled for want of money to sell it to Sir Thomas Byde, a brewer, of London, about 1700. In 1846 it was alienated to James Cudden, and in 1853 sold to Daniel de Castro, and again in 1869 to Mr. George Rastrick.

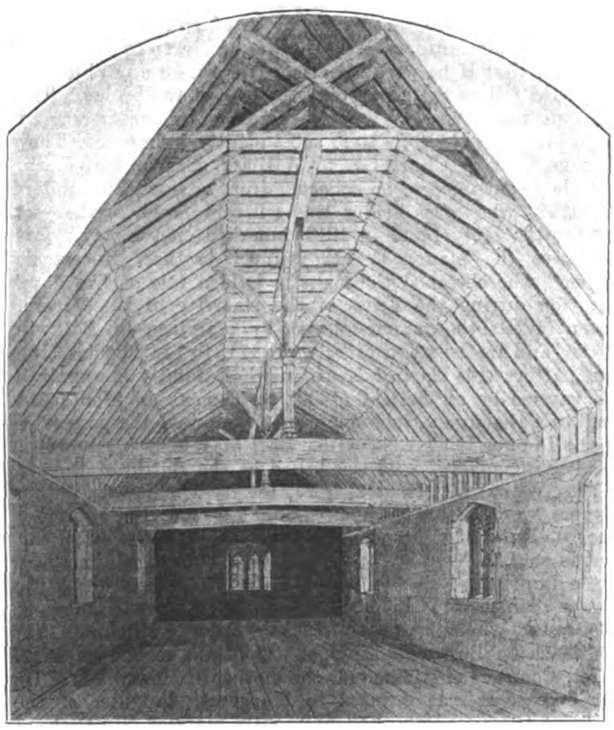
The manor-house is situated to the west of Ware Park, about a mile from Ware. The present building, about which there is nothing of particular note, was erected by Sir Thomas Byde on the site of the house occupied by the Fan-

* A paper read before the Upper Norwood Athenæum on July 3 by Alfred Burch.

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shawes. A very fine avenue over half a mile long runs through the park, which contains some trees of magnificent proportions, said to have been planted by one of the Fanshawes.

There were anciently in the town two religious establishments which various writers appear to have more or less confounded with each other. One of these was known as the "Alien Priory of Ware," a Benedictine monastery, with respect to which Dugdale says:—"Hugh de Grentmaisnil, lord of this town, gave the church of St. Mary here with the tithes thereunto belonging and two carucates of land before the year 1081 to the monks of St. Ebrulf at Utica in Normandy: whereupon it became a cell to that abbey and in process of time was so well endowed that upon the seizure of the alien priories by King Edward III. during the wars with France this was farmed at 200*l.* per annum. After the suppression of these foreign houses this was given 3 Henry V. to the monks at Shene. King Henry VI. for some time annexed it to the abbey of St. Mary near Leicester, but it was afterwards restored to Shene, and, as parcel of its possessions, was granted by King Henry VIII. to Trinity College in Cambridge." A distinct foundation was the Priory for Friars of the Order of St. Francis. This had no connection with the parish church, and was, on the dissolution of the monasteries, given by King Henry VIII. to



OPEN ROOF, WARE PRIORY, HERTS.

one Thomas Byrch, a yeoman of the Crown. The remains of the buildings of this Franciscan priory are incorporated in the building known as "Ware Priory," which by the kind permission of the occupant, Robert Walters, Esq., we have had the pleasure of inspecting this afternoon. The remains consist for the most part of ancient walls fitted up and accommodated to the purposes of a modern dwelling. A small obtusely pointed arch within the north-east angle of the building is supported by corbels displaying the upper parts of human figures, one of which appears to be clad in mail.

The church is a large and handsome cruciform building of flint and stone, in a good state of preservation, with a lofty embattled tower surmounted by a short, thin spire. The body of the church is in the Decorated style of architecture, whilst the chancel and tower are Perpendicular. The tower contains a peal of eight bells. The church is dedicated to St. Mary, and appears to have been erected towards the end of the fourteenth century. The chancel is said to have been built by Joan de Holland, the "Fair Maid of Kent," the wife of Edward the Black Prince and mother of Richard II. The interior is both roomy and striking. The fine chancel arch, the beautifully moulded columns which divide the aisles from the nave, and the lofty, open timbered roof contribute a grandeur and beauty which cannot fail to excite admiration. The large memorial window in the chancel represents the Crucifixion and other scenes illustrating the Passion of our Lord. The fine window in the north transept is designed to illustrate the Te Deum. Near the bottom of this window may be seen the wife of the Black Prince presenting a silver model of the church which she has dedicated to the service of the Supreme Being. Separated from the chancel by a new and handsomely carved oak screen and double arch with a slender clustered shaft of polished Purbeck marble in the middle is the lady chapel, spoken of as "the burying-place of Ware Park." Prior to the restoration of the church the mural marble monument now in the south transept of Sir Richard Fanshawe rested here. In the chapel are a piscina, sedilia, and aumbries. The west end of the chapel is separated from the south transept by a carved oak screen. The south transept also appears to have been made use of as a chapel, as shown by the piscina in it. When the church was restored many of the monuments were removed, and either lost or set up in other places. An altar tomb in the north transept had at one time some good brasses, but the churchwardens have put it on record that they were stolen several years ago by a dishonest parish clerk. The stone matrix with the bitumen in which the brasses were embedded still adhering to it is laid down in the south transept. Of the brasses



ST. MARY'S CHURCH, WARE, HERTS.

which formerly existed on the floor of the church two or three only are left. One now placed on the wall of the south transept to the memory of William Pyrey and his wives, Agnes and Alice, is remarkable. It would appear from the small brasses beneath the figures of the wives that he had five sons and five daughters by each of them. On the south side of the church a tomb in the churchyard to Dr. William Mead records that he died in 1682, "aged 148 years, 9 months, 3 weeks, and 4 days," a remarkable testimony, if it may be believed, of the salubrity of the county and the longevity of its inhabitants.

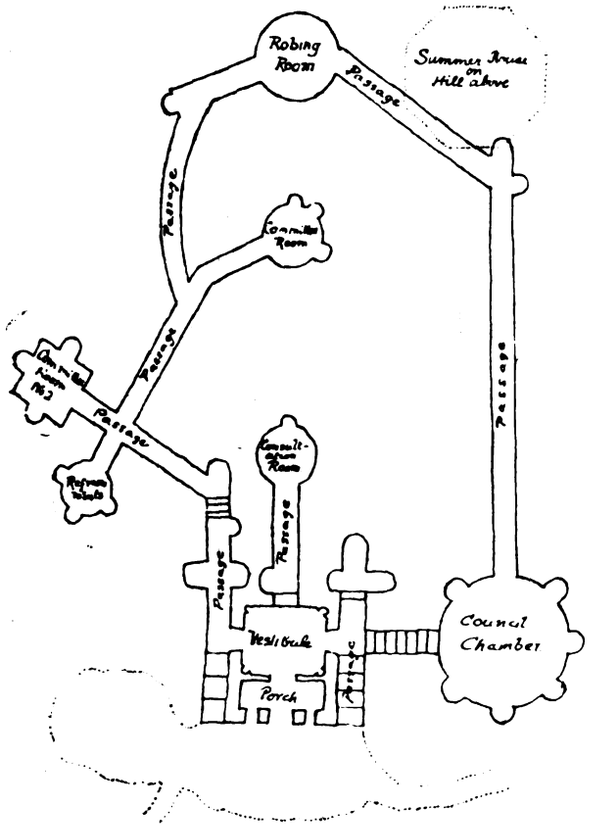
The font, placed just inside the western door to typify the entrance by baptism of children into the Church of Christ is an exceedingly interesting object. It is octagonal in shape, and supported on a base richly carved and moulded. On each side a saint sculptured in high relief is represented, and at the angles are the instruments of the Passion alternating with angels. The figures represented on the panels are St. George killing the dragon; St. Catherine holding a sword and a wheel by which she suffered martyrdom; St. James with a book, Palmer's staff and scrip; St. John the Baptist holding a book and Agnus Dei; the Virgin Mary, with a lily growing from a vase by her side; St. Louis holding a scroll and sceptre, surmounted by a fleur-de-lys; St. Margaret piercing a dragon with the foot of a cross; and St. Christopher carrying the infant Christ on his shoulders. The execution of the font is, from the fashion of the armour worn by St. George, ascribed to about the year 1380. The figure of this saint, although more crude in workmanship, is said to be in nearly every respect similar to the magnificent effigy of the Black Prince in Canterbury Cathedral. (Cussans, Thorne, and others.)

The registers date from 1553, and are complete, except that several pages are missing between the years 1706 and 1730.

The church was restored in 1850, and again internally in 1881, when the mouldings and tracery were re-chiselled and a good deal of new work inserted.

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Amwell House, close to Ware railway station and now the Ware Grammar School, was formerly the residence of the Quaker poet, John Scott, generally known as "Scott of Amwell." In the poet's time the grounds attached to his house attained a good deal of celebrity from the fact that they contained a grotto constructed by Scott, with the aid of a native of Ware named Frogley. The grotto is a curious one, embellished with flints, shells, &c., and is understood to be about the best-preserved specimen of its class remaining. It is cut in the side of a chalk hill, and consists of seven different chambers all connected by underground passages. Thorne, writing about 1876, says, "The chambers now bear such titles as the Palm Pillar Room, the Hermit's Cave, and the Quaker's Room." The precise object which Scott had in view in constructing his grotto is not known. Above the grotto are two small summer houses, on the floor of one of



SCOTT'S GROTTO, WARE.

From a drawing by Mr. R. T. Andrews in the East Herts Archæological Society's Transactions, 1899. *(By permission.)*

which the date "1764" appears worked in small pebbles of a different colour to those surrounding it. There is also a small summer house which is said to have been Scott's favourite retreat. The grotto attracted the notice of Dr. Johnson, who is said to have called it "Fairy Hall," and to have "excited in Mr. Thrale and his lady the curiosity to see the gardens and grotto."

No paper on Ware would be considered replete without an allusion to "John Gilpin," that celebrated "citizen of famous London town," immortalised by the poet Cowper. It appears that Lady Austen, a friend of Cowper's, told him the story of Gilpin one evening, which so tickled his fancy that he was kept awake during great part of the night after hearing it, and next morning turned it into a ballad. It first appeared in the *Public Advertiser*, but without the author's name. It was subsequently reprinted in many forms, and was the talk of all classes; while prints of "John Gilpin" were to be seen in many of the shop windows. In 1785 Cowper wrote to a friend:—"I return you thanks for a letter so warm with the intelligence of the celebrity of 'John Gilpin.' I little thought when I mounted him upon my Pegasus that he would become so famous. I have learned also . . . that he is equally famous in Scotland, and that a lady there had undertaken to write a second part on the subject of Mrs. Gilpin's return to London, but, not succeeding in it as she wished, she dropped it. . . ." (H. Morley.)

On page 454 of William Hone's "Table Book," published in 1827, is an engraving depicting "Mrs. Gilpin riding to Edmonton." The good lady is astride a three-barred gate, and the following verses, with "the sketch (probably from the poet's friend Romney) was found, in the handwriting of Cowper, among the papers of the late Mrs. Unwin." Mrs. Unwin was the wife of the clergyman with whom Cowper lived for some time at Olney, in Bucks, after the death of her husband. The verses run:—

Then Mrs. Gilpin sweetly said
Unto her children three:
"I'll clamber o'er this stile so high,
And you climb after me."

But having climb'd unto the top
She could no further go,
But sate, to every passer-by,
A spectacle and show.

Who said, "Your spouse and you this day
Both show your horsemanship,
And if you stay till he comes back,
Your horse will need no whip."

Notwithstanding the King's prohibition, a tournament was held at Ware in the 25th year of the reign of Henry III., when Gilbert de Mareschall, Earl of Pembroke, lost his life by falling from his horse and being trampled upon. One of his knights was also slain in the diversion, and several others wounded.

The most noted of the local antiquities, and, indeed, one of the curiosities of England, is the "Great Bed of Ware," which was famous even in Shakespeare's time, and is referred to by him in "Twelfth Night." It is said to have belonged to Ware Park, but was kept at the Crown Inn until that building was demolished in 1675, when it was removed to "The Bull" and afterwards to the "Saracen's Head." It is now at Rye House.

As might be expected, some of the private houses and premises in Ware contain features of archæological interest. In the house occupied by Mr. Ward in the High Street there is a richly carved mantelpiece, some old oak panelling and ornamental plastering, and, in the drawing-room, what is known as "the waggon ceiling." In the shop of Mr. Price, printer and stationer, in the High Street, may be seen an old carved ceiling, believed to be coincident with a carved mantelpiece bearing the date "1648" in a private room upstairs. The out-premises of Mr. R. W. Harradence in the High Street contain some window openings and doorways with Gothic heads and mouldings which Mr. R. P. Andrews, of the East Herts Archæological Society, is of opinion "point decidedly to the existence of a perpendicular building" dating from "about the close of the fourteenth or the middle or early part of the fifteenth century."

It is recorded by Cussans that "at a Court held in 1670, it was decided that a ducking-stool should be erected within the manor for the punishment of scolds and termagant women"; and on a subsequent occasion, being found out of order when its services were about to be called into requisition, the bailiff was fined fifteen shillings for his neglect of duty.

In 1831, when some ground was being opened to form a new lock in the valley of the Lea, the skeleton of a man was found, and, some nine inches deeper, a steelyard, which appeared to be of Roman origin. The weight belonging to the instrument was found a few inches lower still, together with a brass coin of Domitian. Close by was also found a curiously worked brass candlestick, an iron axe-head, and a finger ring. Subsequently, at a little distance away, was found a pin such as was used by ladies for their hair, a Roman key, two stones which appeared to have been worked for the purpose of grinding, a coin of Severus, and a large earthen vessel. Four coffins of stone with lids nine inches in thickness were also found when a ditch was dug across a field called "Bury Field." In 1899, when excavations were made in this field for the site of Messrs. Allen & Hanbury's factory, numerous relics of Roman occupation were found, a full account of which is given by Mr. Andrews in a paper published in the Transactions of the East Herts Archæological Society of 1900. The objects consisted of "pottery, small coins, glass, and the remnant of a small bronze spear-head."

The New River runs through Ware, and its sources are in the immediate neighbourhood—Chadwell, about a mile east of Hertford, and "Emma's Well," at Great Amwell. The river was designed to supply London with water, and was constructed by Sir Hugh Myddelton, Bart., with the aid of monetary assistance from the Government, in consideration of which King James took "a moiety of the interest in profits to arise from the New River for ever." So valuable has this property become that the original founders' shares now command fabulous prices.

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I cannot close this somewhat lengthy paper without a brief reference to Izaak Walton, the author of the "Compleat Angler," who spent a great deal of his time by the Lea in the neighbourhood of Ware and Great Amwell; to Charles Lamb, who passed much of his childhood at Blakesware, some four or five miles from Ware, and who has commemorated his stay in his essay entitled "Blakesmoor in H——shire"; and to William Godwin, sometime minister of the Independent Chapel at Ware, who in 1793 wrote a book entitled an "Enquiry concerning Political Justice." Of "William of Ware," who is said to have been the teacher of John Duns Scotus, a distinguished theologian and Franciscan writer, I have been able to obtain little or no information.

ARCHITECTURE AND TOWN PLANNING.*

IMPROVEMENTS in the laying out of our cities seem ever before us, and yet we do not succeed in obtaining any decided model which could serve for all time and for all cities. In new developments one finds, at times, unpardonable blunders and want of foresight; and, in old cities, wasted opportunities frequently stare us in the face. Take one instance only—Margate. In walking up to Cliftonville the painful result of letting building owners do what they like is apparent—blocks of bricks and mortar jut out at every conceivable angle, and muddle takes the place of what might easily have been a fine stretch of sea front right away to Kingsgate. Innumerable similar instances could be cited.

The subject of town planning has always been a favourite one with architects; and in the literature of within the last hundred years one finds Sydney Smirke, James Pennethorne, and other architects bringing to bear their taste and their skill in the earnest endeavour to improve this great London of ours. But, even as now, their efforts fell upon deaf ears. Through want of enterprise, and even of common-sense on the part of the ruling authorities, fine and cheap opportunities were given the go-by—and then ground values ran up, stopping, on the score of price, any chance of revival.

Whilst on the subject of price of land there can be little doubt that our system of leaseholds, which in London dominates building transactions, does to a certain extent affect town planning. Freeholders as a rule, particularly the great ground landlords, do not give away much land for the sole purpose of public improvements, and certainly the man who only holds an eighty years' building lease cannot be expected to sacrifice much of his 10*s.* a foot superficial ground for the benefit of his fellow-citizens, so that, between the two, good town planning goes to the wall. Now, in Paris, when it was Baron Haussmannized prior to 1870—and subsequently to 1870—the expropriations were taken in hand by the city authorities; the ground for building was laid out in plots and the freeholds sold by tender. Thus if any purchaser felt a desire to effect some improvement in the re-alignment of his plots, he knew that if any advantage accrued thereafter he would be the gainer. In London the authorities for making public improvements do so, as a rule, either under special Acts of Parliament, or under that well-tried and marvellously comprehensive statute known as Michael Angelo Taylor's Act. It cannot be denied that many more widenings of narrow important thoroughfares would take place if the large ground landlords of London co-operated more with the authorities, by way of reduced prices, than they are in the habit of doing—thus lessening the enormous cost of carrying out what, after all, are schemes benefiting generally the whole community, and often particularly the great ground landlords.

It is somewhat curious that a practical suggestion to beautify and make more commodious the city of London came some years back from a gentleman who had passed a great part of his life in one of our Colonies—I refer to the late Mr. William Westgarth—and it was due to him that I, and others, commenced to lay down our respective views on London improvements.

In December, 1883, that gentleman offered the Society of Arts a large sum of money to be awarded in prizes for essays on the best means of providing dwellings for the London poor, and on the reconstruction of Central London. Several architects competed for the prizes, and I was one of the fortunate winners of 100*l.* for an essay sent in on December 31, 1884. Since then, by papers read at the Royal Institute of British Architects, and at the Surveyors' Institution, the subject of improvements in London has been well brought to the fore. Much credit is due to Mr. Ebenezer Howard, the author of "Garden Cities," for that patient and far-seeing work which has produced such fine results in the way of town planning improvements. Continued and deep interest in this grand Metropolis should always be uppermost in the mind of every architect, and indeed of every citizen. I venture to think that such a catastrophe as that which happened to the City of London after the Great Fire in 1666 would be impossible to-day. We all know that Sir Christopher Wren and Sir John Evelyn prepared plans for the rebuilding of that part of the City which was destroyed, and that those plans were completely upset, and the opportunity for a fine piece of planning for ever lost, not on account of cost, but because an obtuse authority pooh-poohed the schemes which the superior intelligence of Wren and of Evelyn had evolved.

Successful town planning is not so easy as it looks. Given large vacant areas to deal with we must at the same time provide large heads to evolve satisfactory plans. Turin, for example, had large vacant areas, and the Italian architect or engineer who laid out the city did it on those strict and straight geometrical lines which form a subject of regret to all lovers of the picturesque, who can perhaps make up for their disappointment by coming back to England and viewing that incomparable bit of perhaps accidental embodiment of the picturesque and architecturally beautiful known as the "High" of Oxford.

Take again the recent clearances and town planning of Rome; ambitious and inappropriate architecture obtrudes itself on streets too wide and too straight, and dwellings for the poor of Rome are more like plaster palaces. The Ringstrasse of Vienna we in London cannot hope to imitate; Paris has had its way and its day; Berlin is being, in parts, transmogrified, and deeply afflicted with that disease which appears spasmodically in London, known as "l'art moderne." It still remains for little Brussels (and other parts of Belgium) to hold up its head as the best exponent of what is grand, beautiful, and appropriate in the way of town planning.

And what are we doing in London? Great and expensive clearances have taken place; the Corporation of the City of London can well be congratulated on its liberality and on its wisdom. The Tower Bridge and its approaches, notwithstanding the sneers at its so-called sham bridge architecture, is an everlasting tribute to energy and foresight, and the widening of London and Blackfriars Bridges will not be forgotten by City pedestrians and drivers. Many pieces of expensive and extremely useful widenings of streets are also due to the Corporation, and the value of its co-operation is to be found in Queen Victoria Street and the Victoria Embankment, by which the old and sometimes despised Metropolitan Board of Works were enabled to lay the indelible mark of its finger upon two unquestionably grand results of its wisdom and of its enterprise.

Then let us, for a moment, glance at more recent examples of town planning as we may call it. "Kingsway" and "Aldwych" are before us. Large sums of money have been expended on these street improvements, and when the sites are all let and the thoroughfares become real business centres, I do not know that we shall have much to grumble at in the way of alignment. Personally I should have preferred the southern end of the new street to have discharged itself into a circus at the junction of Wellington Street and the Strand, making a more direct north and south railway line, but there it is, and the sooner the new sites are all covered with buildings the better.

Victoria Street, Westminster, constitutes a good London improvement, but many years elapsed before it became a success financially. It is a matter of detail, perhaps, but we must all have noticed the better effect of that street by reason of the substitution of white paint on the fronts in lieu of the dark and gloomy stucco which originally prevailed throughout the thoroughfare.

We should all, too, when thinking of town planning, pay due respect and admiration to Nash for the laying out of Regent Street and Regent's Park. Beautifully conceived are the whole of the terraces round the Park. Variety and charm greet us at every view; and although the fronts are all in the favourite stucco of the period, when repainted, as they are every four years, the general effect is decidedly pleasing. It will be noticed that Nash dealt with each terrace in the Park separately, and made each block one carefully designed architectural unity. This method was to a large extent followed in Regent Street, but the more recent demands of trade have led to alterations and additions which

* A lecture by Mr. Wm. Woodward, F.R.I.B.A., delivered at Hampstead on July 28 in connection with the Town Planning and Housing Exhibition.

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have broken up these unities. The Commissioner of His Majesty's Woods and Forests is, however, securing piecemeal the restoration of these architectural unities, by demanding that a row of buildings between thoroughfares shall be treated distinct as architectural blocks, but not necessarily that all the blocks shall be of the same precise character. We shall thus secure variety of treatment, and avoid that monotony which one regrets in certain Continental cities.

One of my own favourite projects, which I have been at for over a quarter of a century, is the opening of the Mall to Charing Cross, and I have always held, and still hold, that a grand triumphal arch should have been formed at Spring Gardens, opening up to the Strand a magnificent vista of trees and avenue right away to Buckingham Palace. But, very unfortunately I think, we find that three small arches have been formed with a heavy superstructure of stone which completely mars and prevents the fine view up the Mall which we could so easily have had. The Coronation Avenue behind these arches is a very fine one, leading up to that memorial to our beloved Queen Victoria which we are all looking forward to as the triumph of the united efforts of Sir Aston Webb and Mr. Brock. This opening to Charing Cross is now in danger of being further marred by the retention of four or five houses at the corner of Spring Gardens which should certainly be removed.

Another recent effort at a public improvement is at the Marble Arch. Mr. Speaight—the author of that scheme—is entitled to the gratitude of all Londoners. It is, however, to be regretted that he did not, while he was at it, shift the Arch itself to the entrance to the new avenue across the Park, where the new piers and gates have been erected, and so give the Arch a *raison d'etre*. Now, the Arch, divested of its former surroundings, stands nakedly in isolation, and what might have been a thoroughly good work has been marred by an architectural blunder.

We are not equal to some of our forefathers in beautiful town planning. Everlasting gratitude is due to the wisdom and liberality of the owners of the land forming the squares of London. Take the neighbourhood of Pentonville, and that of the centre of the West Central District, and there you will find acres of land given up to the open spaces called "Squares" which provide lungs in place of what might have been unhealthy congested areas. And so with our Parks. I do not know any Continental city which can excel us in our parks, and they certainly cannot in our squares.

I have no doubt that much of what I have just read has occupied the mind of Mr. John Burns—the President of the Local Government Board—who has a very keen eye for the picturesque, useful, and healthy, and he has brought in a measure entitled "The Housing, Town Planning, &c., Bill," the object of which is, no doubt, to prevent as far as possible the loss of good opportunities, and to provide better housing for the working classes.

I am not concerned at the moment, bearing in mind the title of this paper, to consider so much in detail the provisions of the Bill as regards Clauses 10 and 11, but there can be little doubt that to leave to "four inhabitant householders" the power to put the ratepayers to the expense of a Local Government Board enquiry is very dangerous, and the power of the Board is supreme. Clause 14 respecting orders for demolition should, I think, be well looked into before being passed.

But even speaking as an architect, one can hardly allow to pass unnoticed that part of the Bill which gives so much freedom to local authorities to appropriate any land in their possession as a building site for dwellings for the working classes, including common land, or public parks, gardens, or other open spaces of which they may be custodians. This places in jeopardy many of those fine open spaces which have been acquired in recent years by beneficent bodies at great cost to the community generally, and to private individuals in particular, and which have done so much also to improve the surroundings of those open spaces, and to provide fair breathing areas for our over-crowded city. It is too dreadful to contemplate the possibility of portions of beautiful Hampstead Heath, for example, being appropriated for dwellings for the working classes, or, indeed, for those of any other classes. It may be said that it is quite improbable that any local authority would be so obtuse as to suggest the giving up of any favourite open space for either a bit of new town planning or a row of working-class dwellings; but one has to consider the power as we find it under Clauses 7 and 8 of the Bill of last year. It is true that Mr. Burns has consented to amend these clauses, but there are still remaining certain powers in the Bill which, if administered by a body caring more for a particular section of the community than for the whole, would certainly do more harm than good. It would, in my opinion, never do to trust these enormous powers for evil entirely in the hands of local authorities, and certainly not entirely in the hands of the Local Government Board, and I hope that before the Bill becomes law it will be found that to Parliament, and to Parliament alone, shall be entrusted the last word in the expropriation of open spaces in London.

Clause 4 of the Bill, sub-section (2), is quite inadmissible. This clause provides for the payment and application of any purchase money or compensation for lands, estate, or interest affected by the application of the Act. The Local Government Board's decision as to this payment, or compensation, is to be "final and conclusive, and shall be binding on all persons claiming to be interested in the purchase money or compensation so paid and applied." Surely if for the purpose of a town improvement or for the building of dwellings for the working-classes an open space or a piece of one's garden is required, the amount of the compensation should not be left entirely and without appeal in the hands of an individual to be appointed by the Board, whose views one can well imagine would not be entirely lost sight of in his award. There should, obviously, be left an opportunity on the part of the owner to be represented, and an independent umpire should be appointed.

Clause 45, sub-section (3), gives power to the Board to refuse to approve any town planning scheme except with such modifications, and subject to such conditions as they think fit to impose, and sub-section (6) of the same clause gives power to use the land taken for "providing open spaces, parks, pleasure or recreation grounds, or for the purpose of executing any work upon the land, whether in the nature of a building work or not, and the decision of the Local Government Board, whether any purpose is a building purpose or not, is again to be final."

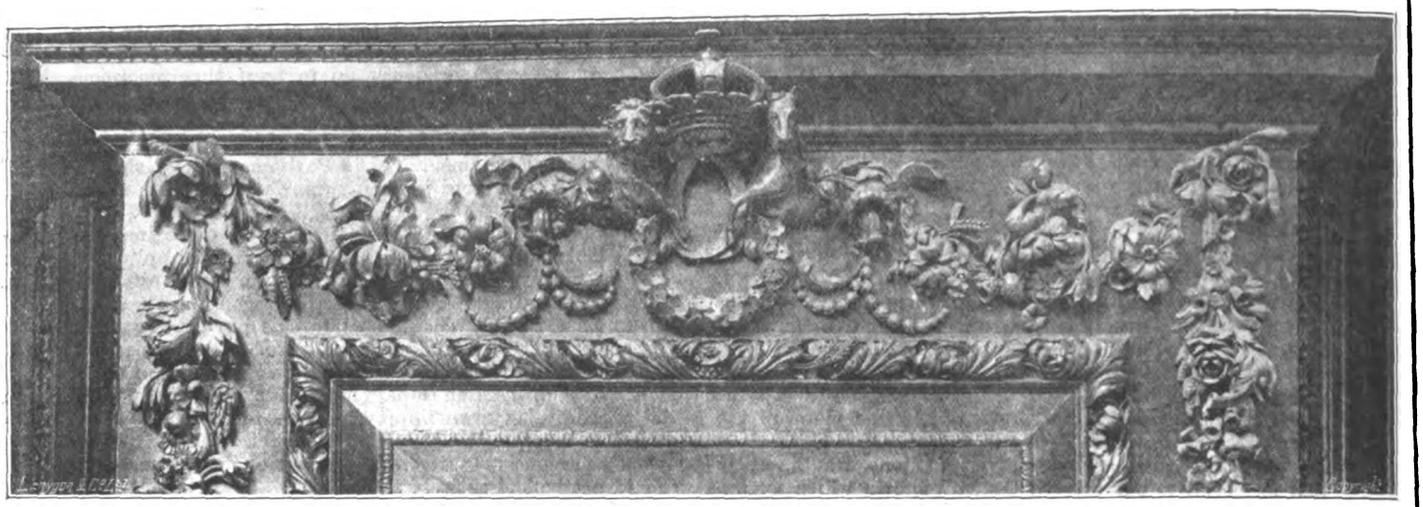
The above two sub-sections require very careful consideration, as they give far too much power to the officials of the Board.

No doubt one of the intentions of the Bill is to provide for more healthy areas and dwellings, and for the better laying out of towns, but the whole of Clause 48, "Power to enforce the Schemes," is too drastic, and sub-section (3) of Clause 49 is a fair startler; because, if the operation of a scheme injuriously affects any property, but at the same time increases the value of certain other property, and compensation is paid, the whole or any part of any sums so paid may be recovered from the person whose property is so increased in value, and sub-section (4) again leaves the whole matter to the final and conclusive decision of the Board. All I can say is that the man who owns property in the vicinity of an improvement scheme has my commiseration, and, further, because under sub-section (5) "the money may be recovered summarily as a civil debt."

I am much afraid that the excellent ideas of Mr. Burns to give facilities for the prevention of planning blunders, and to secure the better architectural treatment of building areas, will not be taken advantage of so much as they might have been because of these drastic measures of expropriation and procedure being left for administration by officials of the Local Government Board, from whose final decisions there is to be no appeal. Many owners of coveted open spaces and gardens may live to congratulate, after all, our sister island by reason of the insertion of Clause 61, sub-section (2), "This Act shall not extend to Ireland." There is another clause in the Bill, viz., 55, sub-section (1), which defines "local authority"—so frequently referred to in the Bill—as "The London County Council." I think that the "local authority" should be the "local authority," and not the great central body whose work is already overwhelming, and whose knowledge of the needs and requirements of the real local authority cannot be so great as that of those living in the locality itself.

Amongst the bodies who are not neglectful of the great benefits which accrue to the general community of a city by reason of successful town planning architecturally treated the Royal Institute of British Architects may be mentioned. In February last Mr. H. V. Lanchester read a paper on "Town and Country: Some Aspects of Town Planning," full of artistic and thoughtful matter; but, like the schemes of many more of us, his were too ambitious and too costly for modern consideration. There was one feature, however, of his design for a main thoroughfare which deserves attention in all such schemes, and that was the provision of insets, or large recesses, in the line of street; and in the recesses he would plant shrubs, flowers and trees, and place

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UPPER PART OF MANTELPIECE WITH CIPHER OF CHARLES II.—School of Grinling Gibbons.

seats, thus affording splendid opportunities for beautiful treatment and architectural successes from the returns or side elevations of the building more immediately fronting the avenues.

Town planning has not been altogether neglected by the great ground landlords of London. The Chelsea, Westminster, Bedford, and Ecclesiastical Commissioners' estates testify to many decided improvements in street outlays, and although the architectural treatment of some of them is not all one could desire, still, there is the good intention, and for that even one must be thankful. At the present moment there is a great scheme before us, initiated and to be paid for by the City Corporation—viz., a new bridge across the Thames between Southwark Bridge and Blackfriars, leading, too, to the southern front of St. Paul's Cathedral. Various objections have been already raised against it. I think I shall have many with me in the suggestion that this scheme would afford a fine opportunity for a competition amongst architects and engineers of England, and I hope these words may reach the ears of the City authorities. There are still splendid opportunities for improvements in London. Trafalgar Square, Piccadilly Circus, the continuation of Pall Mall westwards by a new street into the Green Park, a new street from Oxford Street opening up the British Museum, continuation of the Haymarket southwards by a new street into the Mall of St. James's Park, the formation of a quay or boulevard from Blackfriars Bridge right along past the Tower to Shadwell, and many other improvements suggest themselves.

The Brothers Adam also merit our warm thanks and admiration for what they have done in the Adelphi. The difficulties of level between the Strand and the Thames have been well surmounted by the arches under the streets, and Adelphi Terrace is still a beautiful feature of London. Not only is there a skilful piece of planning and construction in the Adelphi, but the brothers have created a style of architecture simple and good which even now has its many admirers and adherents. We might go further and fare worse as regards what is good and suitable for London.

The value of ground in London is so great that it is of little use calling up purely visionary schemes of town planning. Consideration must be given to the rights of ownership and to created interests, and all schemes which ignore those rights have little chance, I hope, of success. I am afraid that the great increase of traffic of London—a subject crying for remedial measures, one daily and hourly affecting our pockets and our tempers—can only be successfully provided for by bridges or by subways. We dare not hope to drive new streets through the heart of the City, or through the West-End; the disturbance of trade and business, and the terrific cost of expropriation make that idea entirely out of the question; but I see no reason why the Corporation, the London County Council, and Parliament should not seriously tackle this question of bridges and subways to relieve the worst of our congested thoroughfares; and again I suggest this as a fine opportunity for a competition amongst English architects and engineers.

We have still a glorious city wherein to dwell; it holds its own against all the cities of the world by its parks, its squares, and its open spaces. It contains the finest Protestant Renaissance cathedral in the world; its Abbey gives way to no other as an example of a Gothic ecclesiastical edifice; its historic buildings, museums, hospitals, and asylums command the respect and admiration of the world; and there is, above all, that grand old river—the sometime "silvery Thamis"—providing that healthy lung from which we all receive so much benefit; and, finally, there is that corner of Westminster Bridge from which the beautiful curve of the river is seen, embracing the best of river fronts—Somerset House, terminating in the prospect of the great cathedral—and from which also, turning round, there are the Houses of Parliament, Westminster Abbey, and all the other charming surroundings which we know so well.

We have the ability and the money to make these improvements a success; there is better architecture than there was fifty years ago, sounder construction, finer detail, and decidedly finer planning. Our street architecture meets more the needs of the commercial man and the shopkeeper, and if we ignore a little more than we do mere "arty-arty" productions, and give a little more simplicity to our work, clients, the public and architects generally will benefit. The architecture of our new streets shows a stronger desire, day by day, to rid itself of "rococo" embellishments and "stuck on" ornamental carving. Carving is a good servant but a bad master. In moderation it is quite an essential to a successful building, but if sculpture is to be employed (and I for one should like to see it much more employed) it should be confined to interiors in which properly designed provision is made for it. Its use in our exteriors—to rely upon recent examples—is a mistake; our atmosphere does not lend itself to it, and, even if it did, female figures apparently on the verge of slipping off pediments, and male figures in the act of falling from facades of buildings is not encouraging. The most recent examples of sculpture, as applied to architecture, have set back the clock, and have done considerable harm to one of the grandest of our arts. However, let us all hope for the best, and trust that fifty years hence London will be brilliantly the gainer by the incentive now given to good town planning, and to good architecture to adorn it.

We can, and must, make London even better than it is; we want it to be the safest, healthiest, most commodious, and most elegant metropolis in the world, and I conclude by echoing, as I have done before, the words of Voltaire, and say:—"May Heaven send some man, some statesman sufficiently zealous to undertake such projects, with a mind sufficiently firm and enlightened to carry them out; and that he may have trust enough reposed in him to make them a success."

NOTES ON BOOKS.

"The Decoration and Furniture of English Mansions during the Seventeenth and Eighteenth Centuries." By Francis Lenygon. (London: T. Werner Laurie. 31s. 6d. net.)

A COMPLETE treatment of the subject of this book would fill many large and weighty volumes, far too ponderous for anyone to read except the student who desired to become an expert in the restricted field of domestic art of which the author treats. It may be said, therefore, at the outset that the book before us is not a complete and exhaustive

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MANTELPIECE, CIRCA 1770 A.D.

treatise on the subject. It is not such a *magnum opus* as a German professor would have spent his life in compiling, but within its limits it gives a very fair insight into the nature of the decoration and furniture of English mansions during the seventeenth and eighteenth centuries. It should be noted that the scope of the book is limited to two centuries of English domestic art and to the manifestations of that art in mansions, the homes of the wealthy. Hence the examples illustrated are sumptuous and costly. Moreover, they are for the most part taken from the very fine collection of Messrs. Lenygon at 31 Old Burlington Street, a fact that goes to indicate how very great is the wealth of England in magnificent craftsmanship. If one collection, that of Messrs. Lenygon, can furnish some two hundred fine examples as a selection only of the objects it comprises, and even then does not include such minor objects as table glass, fire screens, or indeed anything that is not strictly decoration or furniture of a mansion as distinguished from personal effects, it needs no argument to show that any attempt to completely cover the ground touched upon by this volume is stupendous. Hence we take Mr. Lenygon's book as it is and find it an admirable epitome of the subject with which it deals. The scheme of the book is excellent. A number of short and concise chapters on the various epochs of decorative domestic art in the seventeenth and eighteenth centuries and the crafts concerned give tersely and succinctly the main features of the subject and the influences that affected its development. Thus, the influence of the Flemish and Dutch work on that of England in the time of Wren is clearly pointed out, and the part played by Kent and his patron, Lord Burlington, in substituting Classic Roman and Italian Renaissance precedents as a basis for our own designs is well elucidated. Then the next great change, brought about by the Brothers Adam, is explained, and also the wave of French influence united with the "Chinese taste" that succeeded. By the courtesy of Messrs. Lenygon & Co., Ltd., we are permitted to reproduce some of the illustrations in this volume.

In the Buralem Municipal Buildings Competition, Mr. H. T. Hare, F.R.I.B.A., has just been appointed assessor. Designs have been received from twenty-three architects. The author of the design placed first will carry out the work; the authors placed second and third will receive premiums of 100*l.* and 50*l.* respectively.

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LATE SEVENTEENTH-CENTURY ENGLISH CHAIR.



EARLY SEVENTEENTH-CENTURY ENGLISH CHAIR.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *Arkitektur og Dekorativ Kunst* has given us the result of the competition for the new Bourse at Christiania, with illustrations of the first premiated design by Carl Michalsen of Christiania, and of the second premiated design by F. Rahn of Stockholm. The design by H. Bull is also illustrated. Both this and the first premiated design use Greek Doric porticos to a severe and simple general treatment. Almost barbaric in its somewhat affected simplicity is the crematorium in the old cemetery of Christiania, erected from the designs of Oscar Hoff for the Norsk Likbraendingsforenings.

Der Architekt illustrates additions to the Hotel Wiesler at Graz, of which Marcel Kammerer is the architect; a new bank at Prague for the Wiener Bankverein, by the joint architects J. Zasche of Prague, and Alexander Neumann of Vienna; and the new premises of the Prager Eisenindustrie-Gesellschaft at Prague, of which also Herr J. Zasche is the architect. These are all "new art," but in the last-mentioned example there is sufficient play of fancy to remove the design from the region of barbaric simplicity that is the latest phase of the movement. Quite different and more satisfactory are two designs for a new ball-room at the Italian Embassy in Vienna, by Pietro Palumbo, in which more conventional detail is handled with sufficient originality.

Deutsche Bauzeitung concludes its account with further illustrations of the competition for the new police buildings on the Augustiner site at Munich.

Architekten-und-Baumeister Zeitung illustrates a design by Jacob Modern, architect, for an imposing piece of street architecture comprising shops and flats in Nussdorfer Strasse, Vienna, in which for once "new art" does not figure, but a picturesque and effective rendering of Renaissance motifs quite sufficiently modern in treatment to escape any charge of being archæological.

NOTABILIA.

THE *Burlington Magazine* for this month contains a carefully written article on Philippe de Bourgogne (Felipe Vigarny), by Paul Lafond, with several admirable photographic illustrations of the wonderful work of that great sculptor and architect in the cathedral of Burgos, in which is exemplified both the latest influence of the Flemish-Burgundian school and some of the earliest Renaissance work in Spain.

The Art Journal.—Architects sometimes indulge in etching, as witness, not to mention well-known instances, an example in the current number of the *Art Journal* by W. Hilton Nash, F.R.I.B.A., and therefore the appreciative notice, with illustrations, of Mr. Muirhead Bone's work is of interest. An article containing much truth and real criticism is "The Treatment of Drapery in Painting," by A. L. Baldry. Mr. R. Ll. B. Rathbone continues his series on "The Artistic Training of a Jeweller," and has now reached the subject of the use of twisted and plaited wires. "A Distinguished Woman Sculptor" is an account of the work of Mary Pownall (Mrs. Alfred Bromet), which as illustrated is, if somewhat theatrical, at any rate delineative of character.

Pearson's Magazine in "The Mysterious Mummy," by G. St. Russell, has much information of solid archæological value on the subject of Egyptian mummies and burial customs, cleverly devoid of heaviness, and conveying real instruction in a popular manner, lightly enlightening.

GENERAL.

The Hermione Lectures at Alexandra College, Dublin, are to be delivered this year by Sir W. B. Richmond, R.A. A special course of lectures will be given at the college by Miss S. H. Harrison, entitled "How to Look at Works of Art."

The Late Mr. James Medland Taylor, of Rusholme, Manchester, architect, an ex-president of the Manchester Architectural Association and of the Manchester Society of Architects, and son of Mr. Isaac Taylor, of Stanford Rivers, Essex, left 86,163*l.* gross and 84,047*l.* net.

It is Officially Announced that it is the intention of the Academy—all rumours to the contrary notwithstanding—to hold next winter an Exhibition of Works by Old Masters and Deceased British Artists, and they trust that the owners of such works will kindly lend them with the same liberality as in the past.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, August 14.

Manchester Society of Architects: Visit to "Tirley Court," Cheshire (a residence by Mr. C. E. Mallows).

Tuesday, August 17.

Manchester Society of Architects: Visit to Middleton.

Saturday, August 28.

Architectural Association: Camera and Sketching Club, Visit to Hayes, Harmondsworth, and Harlington.

Saturday, September 11.

Society of Architects: Students' Sketching Party.
Architectural Association: Camera and Sketching Club, Visit to Guildford and district.

THE A.A. EXCURSION—CHELTENHAM.

HAVING reached the fortieth of its series of annual excursions, of which all but very few have been in England, the Architectural Association now perforce finds itself obliged to visit again centres that have formed its base on previous occasions. After a lapse of fourteen years it is hardly too soon once more to make Cheltenham the headquarters for the study of the architecture of Gloucestershire, and particularly of the Cotswold district. As usual, the members of the party gathered in twos and threes on last Saturday and Sunday, renewing the acquaintances and friendships that are so marked and happy a feature of the annual excursions of the Architectural Association. From all parts of England and Ireland come architects to study together for a week, and although there are several who have been present on many occasions, some, of course, for various reasons drop out, but there is always a ready accession of younger men to fill the gaps, and the popularity of the A.A. excursion seems never to diminish. After a quiet Sunday in Cheltenham the party commenced the serious work of the week on

Monday, when in glorious warm and sunshiny weather carriages from Cheltenham were taken for a drive through beautiful scenery to Whittington, where the Court and Church were visited. Whittington Court is a typical Gloucestershire stone country-house of the seventeenth century, with picturesque farm buildings that looked their best in the bright sunshine seen across the duck-pond. Picturesque as is the house with its three gables and porch on the entrance front, it is the interior that contains the most tit-bits of interest, chief of which is the charming newel stair, with good handrail and balusters and an original dog-gate. The newels have clearly originally been continuous from landing to landing, as was the custom in early examples, but have at some time been deprived of the probably turned shaft that ran from the square newel to the soffite of the flight above. A charming feature sometimes, but not often, found in English houses, though common in France, is to be seen at Whittington Court, internal porches to bedrooms, or *tambours*, as they are called across the Channel. At Whittington there is one with very charming detail if somewhat unorthodox. There are several mantelpieces and panellings of interest in the house, not all of the same date, but picturesque and quaint if somewhat coarse in detail, as seventeenth century work is wont to be.

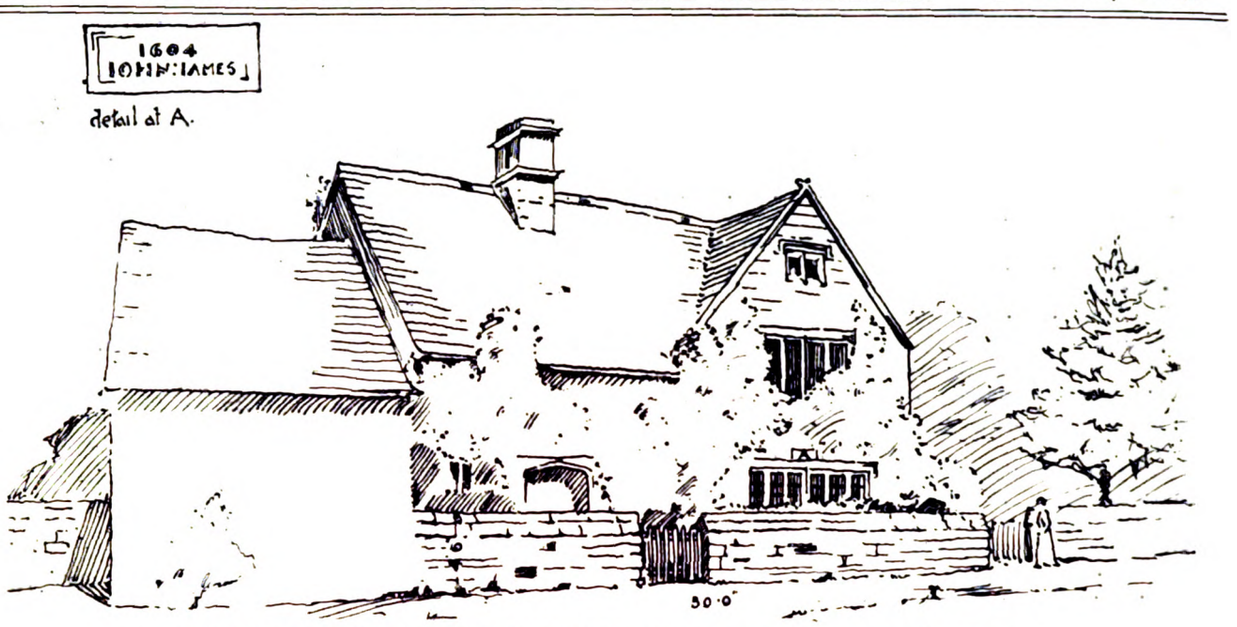
The Church at Whittington is small and, as it stands, though evidently altered, of curious plan. A narrow nave and chancel, with a "processional aisle" on the south side of nave leading to a fair-sized side chapel, is quite unusual. The aisle was certainly wider in Norman times. There are three stone effigies, two of knights and one of a dame in the church, probably of thirteenth century date, and in the chancel wall is a fragment of a triple panel bearing the same arms as those on the knights' shields. On the north side of the nave is a wall arch that probably formed the recess for a founder's tomb.

Leaving Whittington the excursionists proceeded to Charlton Abbots, where the manor-house is another example of the seventeenth century, again with the typical three gables on the principal front. These, with good chimneys, the three storeys in height, and the position of the house on the hill-side, all go to make a highly picturesque composition. Of like nature here also are the farm buildings, charming, though probably unstudied in their grouping. The most interesting feature within the house is the stair, with solid oak treads around a walled enclosure, if not solid wall, 5 feet 4 inches by 5 feet 6 inches. A room with segmental barrel ceiling, some good door frames and panelling, and a carved mantelpiece suggest that the interior was once much more remarkable than it is to-day.

On their way back to Cheltenham from Charlton Abbots the party stopped for a couple of hours or so at Sevenhampton, visiting first the small but curious church, very narrow and very long for its size, with a central tower and transepts said to have been added in the time of John Camber, whose brass records that he died in 1497. The transepts being wider than the nave and tower has necessitated the use of quaint internal flying buttresses, to meet the thrust of the arches and vaulting of the tower. The window of the south transept is very peculiar. Clearly contemporary with the erection of this part of the church, it presents a late fifteenth century attempt to reproduce the form of an early thirteenth century window from memory rather than from measurement. Most of the work done in the fifteenth century, and there is much of it, is quite good though small. This church is one of the many in which the axis of the chancel inclines to the north from that of the nave. The chancel originally was of very early thirteenth century, or possibly late twelfth century date, whilst a Norman lintel over the south door suggests that part of the church may have been earlier still, a suggestion strengthened by a blocked-up semicircular headed arch in the north wall of the nave.

Sevenhampton manor-house, mainly seventeenth century, has been much altered at various dates, and though still picturesque palls a little after Whittington and Charlton Abbots. There are some pieces of old seventeenth century woodwork inside the house, but the main interest of the excursionists was directed to the trophies of big game-shooting and treasures of foreign travel collected by the present tenant, Captain Bears, who received and entertained the party.

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THE POST OFFICE, STANTON, GLOUCESTER. From a Sketch by Banister Fletcher.

Tuesday was devoted to Broadway, the gem of the Cotswolds, and the delightful old market town of Chipping Campden. To economise time and avoid a long drive, the train was taken to Broadway, on reaching which the church was first visited.

The church of St. Eadburgh is a cruciform building with central tower and aisles to the Transitional nave. With the exception of the south transept, the windows are insertions of the fifteenth century, and contain some fragments of old glass. Naturally there has been much modern alteration in the fittings of the church, and an old but not remarkable Perpendicular relic of a pulpit has been repaired and painted crudely and substituted for a fine Jacobean pulpit and sounding-board. There are some remains of old screens, now made up and used for choir stalls, and a Jacobean communion table and rail with a made-up reredos of old panelling.

After a long and hot walk in the blazing sunshine from Broadway village to the old church and back it was refreshing to be in the cool of Abbot's Grange, where the party was received by Mr. Frank D. Millet, the present occupant, who, with the exception of adding a studio, is preserving the features of the old house. The hall with its open roof, the solar with a peep-hole overlooking it, and the abbot's chamber and chapel are all in excellent preservation, and a typical fourteenth-century grange is presented. Very interesting is the collection of bric-à-brac that Mr. Millet has made and has used for the furnishing of the old house. Of course, it is not contemporary, but even seventeenth-century furniture and oddments do not look quite out of place in a mediæval house. After luncheon at the Lyson Arms, which, in the increased popularity of Broadway, has lost much of its old charm and taken on the character rather of a Wardour Street old-furniture emporium, the party visited two of the old houses in the village—Orchard Farm, now occupied by Mr. Robert S. Hichens, and to which Mr. Andrew Prentice has added a charming music-room; and the Court Farm, now the residence of Madame Navarro (Miss Mary Anderson), which also has been altered and enlarged so that two cottages are now joined by a new hall and form a good-sized country house. These two houses, with much old furniture and fittings, some original and some imported, formed an object-lesson in the science of turning cottages into fair-sized houses and making these liveable modern homes while retaining much of their old-world charm.

Leaving Broadway, which, by-the-by, is in Worcestershire, here dovetailed into Gloucestershire, the party drove, with some walking, up the slope of the Cotswolds to Chipping Campden.

(To be continued.)

NOTES AND COMMENTS.

The criticism of Mr. Edwin T. Hall, F.R.I.B.A., on the provisions of the Finance Bill as affecting the estate of Dulwich College, has probably assisted, if it has not wholly originated, the proposal of the Government to amend Clause 11 so as to grant exemption "on the site value of any land where it is shown to the Commissioners that the land is being kept free of buildings in pursuance of any definite scheme, whether framed before or after the passing of this Act, for the development of the area of which the land forms part, and that it is reasonably necessary in the interests of the public, or in view of the character of the surroundings or neighbourhood, that the land should be so kept free from buildings." Of some assistance to building estates that are waiting for builders will be the proposed exemption of land on which the owner or his predecessors in title have spent 100*l.* per acre or more for the purpose of developing the land, although at the time it may not be built upon or used for any business, trade, or industry other than agriculture.

A faculty has been granted for the demolition of Holy Trinity Church, Kingsway, which fell into a dangerous condition, it is alleged, in consequence of construction of the tube railway and other excavations. There seems to be little doubt that despite all the care that the engineers give to the construction of tube railways, such borings through the ground do affect the soil beneath buildings in the vicinity, and lead to settlements that upon occasion may be dangerous to the stability of such buildings.

We are pleased to note that Birmingham is not to be found lagging far behind other provincial cities, but is to have its own Day School of Architecture at the Municipal School of Art. The course is to be one of four or five years and we have no doubt will be found to be as efficient as those already established in Liverpool, Manchester, and other centres. One great advantage that Birmingham possesses is the availability of the magnificently equipped testing laboratories of her University, where architectural students may expect to be able to participate in the instruction in those branches of architectural knowledge that touch closely on the study of engineering.

Whilst it is easy for medical officers of health to strain their powers and inflict injustice, it must be admitted that in the matter of the public health some control over the speculating builder is necessary, and a recent inquiry by the Local Government Board into the condition of affairs at Enfield, in the county of Middlesex, emphasises this point. Absorbent bricks, absent or defec-

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tive damp courses, leaking roofs, insufficient air space and light are characteristic of many of the low-grade tenements, cheap and nasty, which conjoined with cheap travelling facilities have degraded Enfield in many parts from a charming residential suburb almost to the level of a London slum.

Wroxeter, the Roman city of Uriconium, about twice the size of Silchester, the excavation of which latter has added much to our knowledge of Roman life in Britain, has been unduly neglected and with the willingness of Lord Barnard, the freeholder, and the eagerness of Salopians to furnish funds, it seems a pity that the best of our experts in Roman archæology cannot at once turn their attention to Wroxeter. Sarum and Verulamium no doubt have claims, but we have vivid recollections of the remarkable interest of what has already been excavated of Uriconium, and should be glad to hear that further work there is to be immediately undertaken.

The decoration of our public buildings with painting and sculpture is eminently desirable, and what has been done at Plumstead should be an incentive to other localities. Not only is the alliance of the arts necessary to the full fruition of architecture, but pictures are, or may be, undoubtedly in the present day of high didactic value.

ARCHITECTURE: ITS TRUE PRINCIPLES.—XVI.

By R. OWEN ALLSOP.

Ratio and Proportion.

THE term "proportion" is somewhat loosely employed in ordinary discussion on architectural matters. More strictly the meaning intended to be conveyed is *ratio*. Thus the ratio of a capital to its columnar shaft may be 1 to 10, or $\frac{\text{capital}}{\text{column}} = \frac{1}{10}$. The term proportion—in the sense of the geometer—requires a third term. What is *meant* to be conveyed by the colloquial expression "proportion" is sufficiently understood, but it would be as well to reserve the term to define the identity or similitude of ratios, and to say that the relation of one part to another of that which has two parts is in such and such a ratio.

Much has been said in writing on the subject of architectural proportion of "subtlety." Now subtlety is not a pleasant word. It does not suggest simple straightforwardness. Possibly *refinement* is intended by those who employ the term. If so, we are at one with the opinion that there should be refinement in proportioning, since this suggests high reasoning and the impress of mind upon matter which is the essence of a creative art.

We favour distinct and definite ratios. So long as the architect has divided rule and compass and the examples of the refined Greek designers, let proportion (or ratio) be simple; let us get rid of surds. The eye does not like to be perplexed. The process savours too much of deception. It is one of the benefits of brick building that it encourages pure and simple ratios in the division of parts.

The geometrical basis of architectural design, the prime three dimension figures—circle, square, triangle, sphere, tetrahedron, and others—suggest simple ratios in proportioning other concrete figures. The inorganic nature of a building—as distinct from forms of animal and plant life—claims kinsmanship with the crystal as a natural method of bringing geometrical order and design out of the primeval order of sublimity.

It is well that the architect, dealing with inert matter, should work rigidly to some definite scale. It does not matter what that scale be—feet, metres or modules. The essential part is the mathematical division into exactly equivalent parts. To design exactly to scale and to proportion to simple ratios, is a becoming act of humility, as graceful in effect as the idea of rising above mathematical scale and proportion is offensive. Let us recognise our limits. Sublimity is a scale of infinity; our finite works must be to the measure of the finite. Finite order is regularity, and regularity is order. Irresponsible proportioning, guess work, hazarding are disorder. We deal with bricks and mortar—and a percentage. The gods may proportion on a scale we may designate elastic, but whilst man measures the earth and passes along like the hands of a clock it is necessary that his mind advances by equal step-by-step measure in design.

The larger the part the greater the simplicity, should be the guiding rule in architecture, and those inclined to complex involved proportion—materialised "surds"—may remember the Greek architect and his double-square temple cell. Simple ratios please both the eye and the mind; the former because it dislikes involution, and the latter because it recognises the bowing to superior forces—law. We may reasonably leave the idea of infinitely elastic proportions to the oyster in his "parasitically sublime" shell and put ourselves in the yoke of geometry with its squares and circles and elementary basic forms. Time is created as an entity by scoring divisions, of equal value, upon eternity. Minutes and seconds are aliquot parts of the hour. They are there in a proportionate relation. The essence of order is regularity of arrangement, and all beautiful things are based on order, mundane and geometrical, or, if extra-mundane, on the order of sublimity, which we need not pretend to comprehend.

If any part is a multiple of a whole we may say it is proportionate thereto. Unless this is so there is no true ratio, or at any rate a less noble one because less simple, less truly a ratio, and hence less affinity to actual truth itself. If there exists no reason why a certain height, width or depth should not be a simple ratio and refer in simple terms to a given unit of measurement, it is æsthetically more satisfactory that this should be so, just as it is constructionally better that a measure, space or length, should be part or number of the basic scale, whether this latter be feet, metres or modules. In this matter the architect is bound in fetters (and rightly so) where the painter and sculptor, copying that which is based on a Divine system of order (termed sublime), are in a sense more free. It is well that the architect should of necessity be compelled to tread out his spaces with manacled feet. It suggests a state of being under rule, a state of order, of bowing to a superior force.

Whatever the talk about proportion we know in practice it is a matter largely based on the pencil point and the graduations of the scale—the unit of measurement—the true "module" of design, whether half a column's diameter or not does not concern the question. The circle arises from the revolution of the compass point, the sphere is born of the circle, the cube of the square, the tetrahedron of the equilateral triangle. Why, then, when the change is made to less simple and hence less noble figures—superficies or solids—should we wish to cast off the mathematical tether? The architect must be a geometrician and a practical mathematician. All the finer effects are based on these exact sciences. There is no more reasonable course than to be bound in all important ratios by a geometrical spirit, leaving the freer hand to less significant details.

The preceding remarks may be understood to apply to large divisions. Recognised examples support the suggested principle. In smaller affairs the question of what we generally understand by the term "proportioning" may assume a different aspect, and any contrast of varied dimension to regular division (monotony) seems allowable. The designer has a freer hand, and his skill will be a measure of his study of nature and natural objects of beauty; for it cannot be allowed that the art of proportioning is to be learned from the study of architecture solely. It is a question of eye education. To confine the attention to architectural form leads to those strange theories of triangulation that are naturally repugnant to the sentiments of the artist. If anything at all is to be learned from these theories it is that in large parts all true architecture shows a tendency to simple and direct ratio, a fact that might be demonstrated better by plain, figured dimensions than by mysterious circles and

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triangles that cause misapprehension in the mind of the young student. And it must be considered that not so much virtue exists in dimensions of so many cubits width, breadth and height, as that the command is given and obeyed:—*Thus, shalt thou make it.* Decision and definiteness at the beginning of things is indicated, with power, authority and pre-arrangement; as when, while others vacillate, someone draws a line from city to city, and says "Make the railway *so.*" Tables of stone control matters of life and death only. What the simple geometrical mass formation is to composition, so may be assumed to be the law of simple ratio in large parts.

One cannot withhold the thought that too much mental agitation is exhibited over the matter of proportioning in architecture, and that the acrimony of discussion suggests *de facto* the absence of the proportioning sense; and, further, that the elevational instinct, that lies like a curse over much modern architectural design, is responsible for the creation of a stumbling-block. Those who never first conceive a design in the solid, but originate solely with board and square, are necessarily much concerned over relative widths and heights. So also is the composer of pictorial advertisements and the fretworker, and all artists in one plane. Yet we rarely feel called on to criticise the results of geometrical length and breadth in the actual building. If the Bell Harry Tower at Canterbury is seen in evening gloom we perhaps may be drawn to make comparison as to its relative height and breadth; but even here the effect is rarely that of elevation purely, two sides being mostly seen. And if we behold such a view as that in fig. 38, we doubt if any ever may be induced to institute an inquisition as to the arithmetical ratios in the minarets, being solely impressed with the fact of a slender, elegant proportioning. Many of the fine theories of proportioning would doubtless have been seen to have been superfluous had it been realised how widely the ratios vary even in examples of Doric columns, *all* beautiful and majestic.

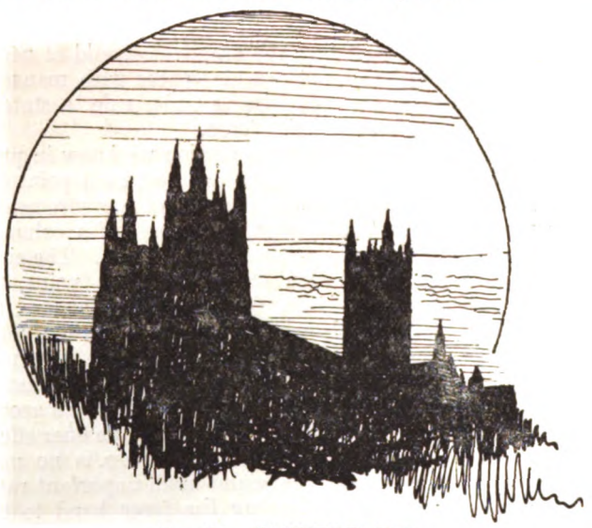


Fig. 37.—CANTERBURY.

If we diverge in proportion from the primal cube the *effect* can only be by extension in height or width; hence, by a comparative analogy, we are never concerned as to the arithmetical proportions of a man, but say that he is *tall* or *short*. The majesty of tall proportion has always been recognised, but in architecture there is also effect by lateral extension. The long nave and lofty tower mutually enhance one another.

That which we intend when we talk about proportioning in architecture, as a root principle, must be adjudged to be not elemental, but compound; that is to say we might reasonably use the title, "The Proportioning of Architecture," in place of a treatise on "Architectural Design." The act of proportioning, rightly understood, includes all principles, or a large number of such. The elevationist does not understand this; nevertheless, it will be seen that when we proportion (in three dimensions) we bring into consideration contrast, gradation, grouping or massing, concentration and climax, and many other qualities. All effects of lineal or superficial proportioning are modified in perspective (true) effect. Naturally, in elevation making we are greatly concerned with proportioning—not a line can be drawn without involving the principle; hence, even in the matter of two dimension design "proportion" is an all-embracing term.

In practical designing, proportion, where not ruled by the prime architectural consideration of fitness for duty, is a matter of beautifully contrasted and varied dimensions, and the opposite is monotonous division—indeed it might be said that this latter is the *foil*, enhancing variation much as perhaps the equal interval and



Fig. 38.—SANTA SOPHIA.

regular beat of the bar in music may be considered a foil or the relieving background to the variation in time-interval and rhythm of the air. There is a wonderful relation between regular (monotonous) motion and music, which may be observed to add a peculiar dignity and majesty to even mechanical motion—where regular—and doubtless herein is the origin of the idea conceived by primitive astronomers as to the music of the heavenly spheres. It may be that the magical effect of the introduction of brick and stone course lines into an elevation is the foil of monotony to the variation of proportional dimensioning. The subject of proportion in architecture is one behoving all to treat upon with due caution and consideration for other's opinions; but it may be laid down that to educate the eye—as the window of the mind—by the study of natural objects of beauty is the only way to acquire the art of what we call "proportioning," and of which the essence is beautiful and interesting contrast of dimensions and sizes. The study can only be by analogy, since nature refuses to be—cannot be—copied, but may be the source of inspiration arising from deductive reasoning. In this manner the field from which to glean ideas becomes inexhaustible, and even if actually-found, natural dimension be literally copied, there is such a fund of these that the whole art world during the life history of our globe would no more exhaust the fount than a thimble remove the waters of the ocean. Thus, the study of the stratification lines in a piece of coal may be more to the purpose than any micrometrical measurement of old Grecian colonnades. As there are more obviously beautiful things than coal, the supply of naturally beautiful dimensions may be said to altogether exceed the demand.

(To be continued).

Mr. William Owen, architect, of Duchy Chambers, Clarence Street, Manchester, died last week. Mr. Owen, who was born in Altrincham in 1852, studied at the Manchester School of Arts, and in 1874 was awarded a gold medal by South Kensington for the best architectural design of the year. He was afterwards elected an Associate of the Royal Institute of British Architects, and he has since carried on an important practice in Manchester and district.

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PORTLAND CEMENT.

THE manufacture of Portland cement has made such remarkable strides within the last few years, as regards the quality of the product turned out by our modern factories, that the standard books of the quite recent past are hopelessly out of date, not only as regards the methods and processes by which Portland cement is now made, but also with respect to the qualifications that should be expected of even the average grade of present-day cement, let alone the finest or special classes of the material. Hence we welcome the second edition of an up-to-date, comprehensive, and scholarly book,* which in its revised and enlarged form may be taken as a synopsis of the latest knowledge and experience in the manufacture and in the testing of Portland cement.

The primary great factor in the superiority of our present-day cement over that of even a few years ago has been the adoption by English manufacturers of the rotary kiln, and it seems that in the near future this type is likely to supersede all others. It is remarkable that although a patent was taken out in 1877 by T. R. CRAMPTON, another in 1885 by F. RANSOME, and a third by F. W. STOKES in 1888, for rotary kilns for "the burning of Portland and other such-like cement," none of these early forerunners of the modern kiln proved a commercial success, the chief cause of failure being the absence of a suitable method of firing. It was not till HURRY and SEAMAN in 1898, followed by other American manufacturers, introduced the method of firing by means of powdered coal that the rotary kiln became a successful apparatus for the burning of Portland cement. Since this improvement numerous and careful experiments have determined the most suitable kind of coal, the amount of air, and the position of the delivery jet, and brought the rotary kiln to its present position of excellence. The form and detail of the rotary kiln is fully explained by the author, as well as those of the leading types of kiln that it is superseding.

It is now tolerably common knowledge that the constituents of Portland cement are lime, silica, and alumina in fairly well determined proportions, and that it does not much matter what limestone and what clay are adopted as the raw material, whether the white or grey chalk and alluvial mud of the Thames and Medway, the marl deposits of the Cambridgeshire district, the Lias formation of limestone and shale in Rugby and South Wales, the argillaceous limestone of the Lehigh Valley in the United States, or of the septaria of the London clay, formerly used for Roman and kindred cements. Corrections of these natural materials, of course, require to be made, an addition of clay in one case, an addition of limestone in another.

The natural materials will always be found to contain other substances besides lime, alumina, and silica, so that the theoretically perfectly pure Portland cement—a compound silicate and aluminate of calcium—is, as far as we know at present, unattainable, but it has always been a puzzle to us that magnesia should apparently be so detrimental to the quality of Portland cement when a large percentage in conjunction with lime, as in the case of some American limestones, produces a remarkably fine hydraulic mortar that can even be used with sea-sand, or, as in the case of the magnesite cements that have recently made possible a new industry, it seems to have valuable cementitious properties of its own. Mr. DAVIS says in respect of magnesia as a constituent of Portland cement, "the exact chemical action has not yet been definitely explained," and this, we must take it, is the extent of our knowledge to-day on the point.

After the rotary kiln the most important element in the improvement of our modern Portland cement has probably been the increase of the degree of fineness to which the product of the kilns is now ground. Many text-books on materials and some architects' specifications still contain the proviso that the cement shall pass 90 per cent. through a sieve of 2,500 meshes per square inch. It is a remarkable step from this to the requirement of the British Standard Specification that the residue on a sieve of 5,776 meshes per square inch shall not exceed 3 per cent. The British Standard Specification has indeed been a great boon to both the manufacturer and the user of Portland cement, not that we think it is perfect and incapable of improvement, but it gives the manufacturer a goal at which to aim and the user a standard of quality with which he should be content. It has also undoubtedly done more than anything else to bring before architects and engineers the high quality of cement that our English manufacturers are now prepared to give us. The improvements in grinding machinery that have done much to render possible this high quality—the ball mill, the tube mill, the "Griffin," the "Edison," and the "Kominor"—are described by the author.

Important to the manufacturer as are the details of selecting and mixing the raw material, burning, and grinding, which Mr. DAVIS, himself a practical manufacturer, describes, it is rather in the second part of his book that most of our readers will find the information that is to them particularly useful and interesting. The mineralogy of Portland cement is vital to the expert who is studying to find out why this useful product has its peculiar properties, and how they may be obtained and improved; but to the architect, the engineer, and the builder the sampling, testing, and uses of the material are of greater moment. Hence we are gratified to find that Mr. DAVIS has gone very fully into this part of his subject, and has given us a valuable account of the mistakes in the employment of cement that may frustrate the improved scientific accuracy and careful methods of our modern high-class manufacturers. The causes of surface cracks, efflorescence, discoloration, "dusting" of floors, shrinkage, temperature cracks, porosity and permeability of concrete, are all lucidly and fully explained. The methods and varied forms of apparatus for testing cement are dealt with at length in respect of fineness, weight, setting, soundness, contraction and expansion, tensile, compressive and transverse strength.

The important question of soundness, with its not necessarily connected phenomenon of expansion and the elements that influence the results of tests for this quality, are thoroughly treated, and particularly the position occupied by the Le Chatelier method, as to which the author's conclusion is that this is a test purely for expansion and not for soundness. Moreover expansion does not necessarily connote unsoundness, nor does the former always accompany the latter, but absence of expansion is a desirable quality in a cement, and this the Le Chatelier test does accurately determine. Other tests for soundness are considered—boiling, steaming, warm water, cold plunge.

With regard to tensile strength, our author strongly urges the adoption of tests with sand rather than with neat cement, both as giving a better indication of the full value of the cement in practice and as tending to reduce the considerable variations that slight differences of the conditions produce in testing briquettes of neat cement. It scarcely needs pointing out that for true comparison carefully tested standard sand must be used, as the results from the use of different sands with the same cement differ widely.

A useful section of the book is that on the ageing of cements and concretes, and the effect of this ageing on strengths, for information as to which, as Mr. DAVIS points out, we have to turn to America, Germany, or France. As an appendix are given the British standard specification for Portland cement, the American standard specification, the German standard specification of Portland cement used in the Prussian Government works, and the French Government specification for Portland cement.

Thus for the manufacturer and the consumer of Portland cement we have a standard work invaluable in every particular to each and all.

* *Portland Cement.* By A. C. Davis, Fellow of the Chemical Society, Associate of the Institute of Civil Engineers, Member of the Society of Chemical Industry, &c. (London: Woodford, Fawcett & Co. 15*s.*)

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ANCIENT MONUMENTS OF SCOTLAND.

THE Royal Commission on the Ancient and Historical Monuments and Constructions of Scotland have issued in Blue-book form as their first report an inventory of monuments and constructions in the county of Berwick. The Commissioners state that they have been "appointed to make an inventory of the ancient and historical monuments and constructions connected with or illustrative of the contemporary culture, civilisation, and conditions of life of the people in Scotland from the earliest times to the year 1707, and to specify those which seem most worthy of preservation.

"The monuments in the county of Berwick have been visited, and a complete inventory, showing the situation and characteristics of each, along with a bibliography, a reference to the Ordnance Survey sheet (6 inch scale) on which it is noted, and the date on which it was visited, has been compiled and is annexed to this report. Your Commissioners consider that to render the inventory of practical utility these details are essential. The number of objects noticed is 260, of which 70, it is believed, have not previously been described. Your Commissioners propose in the current year to review the monuments in the county of Sutherland, and also, if possible, those in the county of Caithness, and lists have been distributed and other preparations made with that object.

"The fact that the Corporation of Edinburgh have recently caused to be compiled and have published an inventory of the older structures in the central part of the Old Town is an encouraging action that merits record. In course of the year various cases in which interesting monuments were threatened with injury or destruction have been brought informally to the notice of your Commissioners, and it is gratifying to record that representations made by your Commissioners have met with consideration from proprietors and others interested.

"Your Commissioners desire to make grateful acknowledgment of the manner in which the work has been facilitated by the clergy and schoolmasters of Berwickshire. Special thanks are due also to the Society of Antiquaries of Scotland."

Ecclesiastical Structures.

Under this heading it may be observed that there are remains of four monastic establishments:—

(1) The Abbey of Dryburgh, in the parish of Mertoun. Though much ruined, it is distinguished by the fine transitional and first pointed details, and for the considerable remains of the conventual buildings.

(2) The Priory of Coldingham, in the parish of that name, the successor of a much earlier foundation mentioned in Bede's *Ecclesiastical History*. A portion of the church alone survives, a transitional building showing detail of great beauty.

(3) Of the Convent of Cistercian Nuns at Eccles only a mere fragment, of Norman and transitional style, is left.

(4) The Priory of St. Bothan at Abbey St. Bathans, represented by the east wall and by a portion of the north wall of the existing church, and also by the recumbent figure of a prioress lying therein.

There are remains of Norman churches in other parts of the county, at Bunkle, Chirnside, Edrom, Legerwood, and St. Helens (Cockburnspath). Among ecclesiastical structures of later date, the most worthy of note are Ladykirk, said to have been built in 1500, and a perfect specimen of Scottish church architecture of that period, pointed barrel vaults of stone being used throughout; Cockburnspath, remarkable on account of the unique feature it possesses in the round tower rising in the middle of the western wall and having its upper portion pierced with cruciform loopholes of a somewhat military character; Greenlaw Church, noted for a fine square tower with vaulted basement and corbelled-out parapet, also suggestive of a keep; and the church of Lauder, bearing the date 1673, and a good specimen of the debased Gothic of the seventeenth century.

Castellated and Domestic Remains.

These, though numerous, are mostly unimportant. Cranshaws is the only keep still in its original condition standing alone and inhabited. Others, as at Duns Castle (Duns parish), Cowdenknowes (Earlston parish), Bemersyde (Mertoun parish), Hutton Hall (Hutton parish), and Wedderlie (Westruther parish), though still occupied, have been merged in houses of later date, and some of them have been largely transformed. The ruined keeps number sixteen.

Of houses of the seventeenth century still inhabited Wedderlie, which is unaltered, and bears the date of 1680 is a good example. The castle of Thirlestane, near Lauder, though considerably added to in modern times on the west front, is the most remarkable historical dwelling in the county, and its plan is unique among Scottish mansions. The houses of Nisbet, Cowdenknowes, Hutton Hall, Houndwood (Coldingham parish), and The Hirsel (Coldstream parish), all of which have been enlarged or modernised, still retain ancient features of interest. Of the ruined houses of a defensible character, Greenknowe Tower in Gordon parish is the best example.

Moated Mound.

The only example of this kind of construction in the county is on the Castle Law estate, parish of Coldstream. It seems to have escaped particular attention hitherto, but it is a very good example of a class of constructions now generally recognised as defensive works of early Norman date.

Prehistoric Remains.

1. *Defensive Constructions.*—In this connection we may take first the constructions noted under the general heading of forts on the Ordnance Survey maps. These, for purposes of observation, fall naturally into four geographical divisions:—(1) Those in the vicinity of the coast; (2) those inland; (3) those in the hilly districts of Lauderdale and adjoining parishes; (4) those that are occasionally to be found on isolated eminences or other defensible sites throughout the south-eastern or lowland half of the county. In the first division may be noted the enclosure on Ewieside Hill, Cockburnspath, surrounded by three ramparts, for the greater part in excellent preservation; it shows unusual features at the entrance to the interior. Attention may also be drawn to the large number of enclosures which have been obliterated in this parish. In the region around St. Abb's Head and Coldingham Loch lies a remarkable group, whereof the survival is no doubt due to the fact that many of the enclosures occupy the summits of small rocky eminences unsuitable for cultivation. The second division includes a remarkable series of enclosures beginning at Warlaw Hill, in Coldingham parish, and running along the ridge of Bunkle Edge, through the parish of Bunkle and Preston, till it terminates on the south slope of Staneshiel Hill, in Duns parish. The most noteworthy among them is the fort at Prestoncleuch, surrounded on two sides by three ramparts, which here and there are 10 feet to 12 feet in height. In the third division of the county prehistoric defensive constructions are both numerous and important. In the parish of Lauder there are fourteen, the most conspicuous examples of which are Longcroft, containing numerous foundations; West Addinston, where the inner rampart on the north-west is still 17 feet high, and at the entrance shows curious crescentic depressions traversing the roadway, with circular foundations in the interior; Tullis Hill, a circular construction in good preservation, with a well-defined rampart 12 feet or 13 feet high above the bottom of the ditch, and a stony rampart on the top of the counterscarp; and the Haerfaulds. The defensive enclosures in the southern half of the county are few and unimportant, and have suffered much from the plough.

2. *Sepulchral Constructions.*—Few of these remain intact, and the total number noted in the county is only ten. One of them, however, calls for very special remark—viz., the Long Cairn at Byrecleugh, in the parish of Longformacus, known by the name of the Mutiny Stones. From its external features this appears to be representative of a type that frequently occurs in the north and west of Scotland in association with stone age burials, but it is the only one of its class hitherto noted in the south-east. There is only a single stone circle in the county—that situated on the moor to the north of Lauder. It is of large diameter, has the greater number of its upright stones still *in situ*, and does not appear to have been excavated. The stones seem small, but the soil in which they are sunk is peaty. There are the remains of cairns in the neighbourhood. The Twinlaw Cairns, in Westruther parish, though conspicuous landmarks throughout the county, have been excavated and reconstructed.

Miscellaneous Objects.

Earthhouse.—Belonging to the prehistoric era is an earthhouse at Broomhouse, in the parish of Edrom. The entrance has been covered with earth for preservation of the structure.

Village Cross.—The village cross at Cockburnspath is worthy of remark. It is a handsome structure, bearing on the four faces of its capital alternately thistles and roses, and is kept in good repair.

It is perhaps desirable to note that there is no recognised Roman construction in this county.

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A PRACTICAL TOWN.

IN connection with the Town-Planning and Housing Exhibition that has just been closed at Hampstead, a lecture was given on the 4th inst. by Councillor J. S. Nettlefold, of Birmingham, on "A Practical Town," i.e., one suitable for a commercial centre. Commercial centres are, he said, composed of public buildings for administrative, religious, recreative, educational and other purposes. (1) Manufactories, warehouses, offices and shops. (2) Private dwelling houses and public parks, playgrounds, open spaces and allotments. (3) And, in completion the means of communication which require at least as much careful forethought and planning as any other part of a town. There is unfortunately in our English local government great lack of co-operation, not only between the various committees composing those bodies, but also between those bodies and the directors and private individuals, manufacturers, merchants, house-builders, &c., but perhaps the worst feature of all in English local government is the fact that most commercial centres are governed by several entirely distinct local authorities, each struggling with the other for what it thinks to be its own interests, instead of all pulling together for the common good of those who live in one part of the town, and work in another.

Supposing those difficulties have disappeared, how should we plan our practical town? Administration comes first. The principal buildings for this purpose should be the centre of our town as they are of our civic life, and should be business-like as well as dignified, depending for their impressiveness on beauty of line, rather than on excessive ornament. It is most important also that there should be plenty of free space round this centre. Other public buildings, religious, recreative, educational, &c., should also be placed on main thoroughfares with open spaces around them. Our next concern is the individual employment of citizens. Factories and warehouses should be at the rear of the town, and properly served by railways and canals.

And now we come to the enjoyment of the citizens, the home and its surroundings. In placing business buildings on wide main arteries radiating from the centre in the way suggested, we shall provide oases where dwelling houses can be put. In these districts, the actual roadways should be narrow, with tree-planted grass margins and pleasant footpaths on either side. In England main arteries are far too narrow, and the roadways of side streets far too wide. Open spaces, playgrounds and allotments are a great deal better on back land than when located on valuable frontage, which might be, from every point of view, more profitably used for houses.

Hampstead and other garden suburbs have shown the practicability of what is suggested above. To-day we are not considering mere ideals, we are considering accomplished facts. That brings us to the means of communication between the constituent parts. At present this matter is not thought of seriously until a town has grown up. If it were thought of from the commencement, difficulties now almost insurmountable would become easier, and the cost of carrying out the work infinitely cheaper. Many millions of the ratepayers' money have been spent in this country for pulling down buildings that never should have been put up. Take for instance the large amount of property that had to be pulled down in connection with the making of the thoroughfare from Charing Cross to Portland Place early in the eighteenth century. Similar mistakes have been repeated over and over again; it is only necessary to instance Kingsway. To-day there are happily good grounds for hoping that we, commercial Englishmen, will, as a nation, soon be giving as much attention to the rational enjoyment of our fellow citizens as we have done in the past to their profitable employment.

ILLUSTRATIONS.

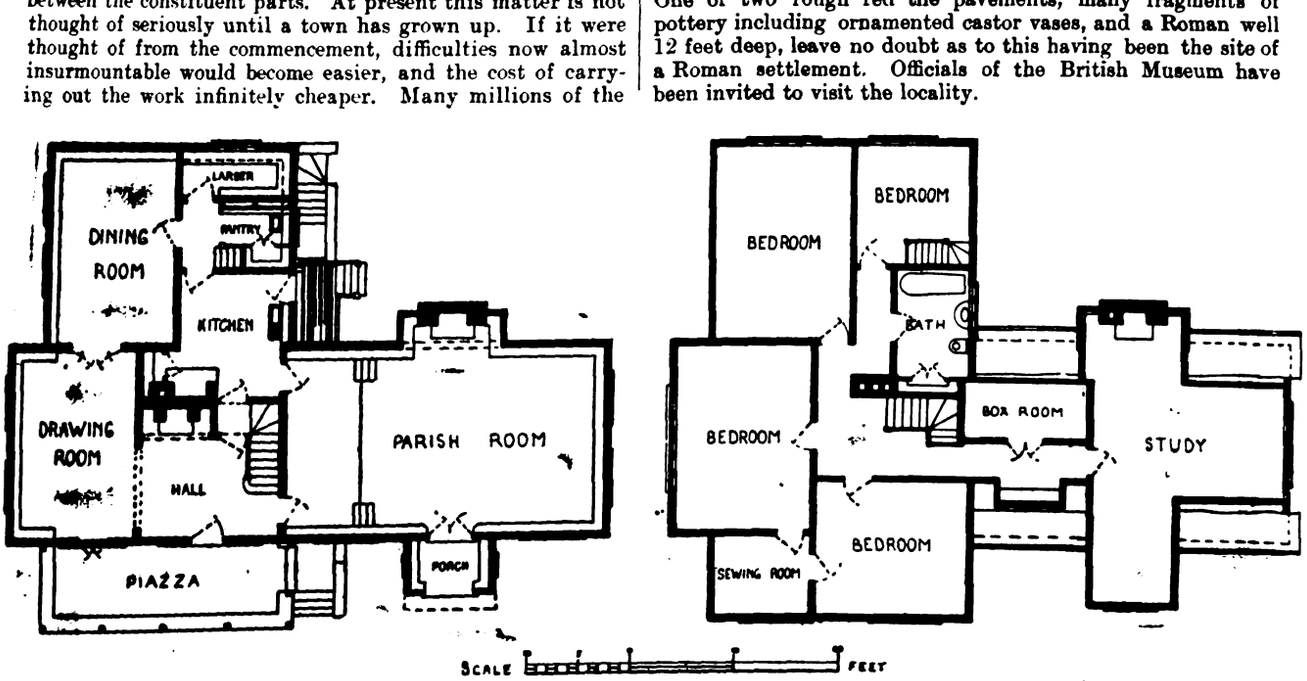
ALLANGATE, RUSTINGTON, SUSSEX.—GARDEN FRONT—FRONT ENTRANCE GABLE—ENTRANCE FRONT.

THIS house faces the main road between Littlehampton and Worthing, from which it is screened by a high rubble wall. It was built for W. Rawson-Shaw, Esq., J.P. Local materials were almost exclusively used, the most noticeable exception being the stone dressings, which are Doulting The bricks and tiles are hand-made. The contractors were Messrs. Cornish & Gayner, of North Walsham. The house was erected from the designs of Mr. R. Heywood Haslam.

RECTORY AND PARISH ROOM, GLYNDON, NEAR BALTIMORE, U.S.A.

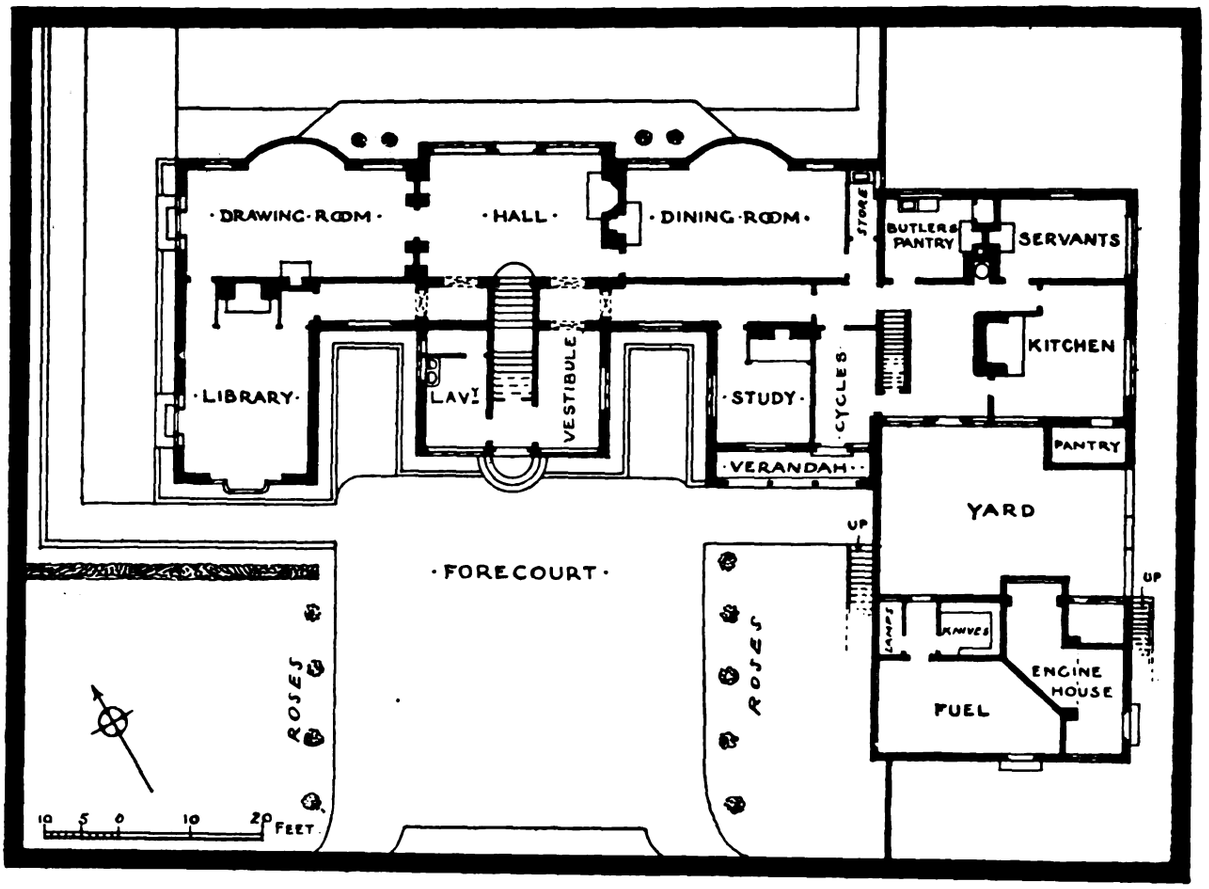
THIS building is being started at once. The walls to the cellars, and to a height of 6 feet from the ground, will be built of local stone. The walls above will be of stud-work, faced with half-timber work, and the roofs will be covered with shingles. The walls inside will be plastered and the woodwork generally will be stained dark brown. The full detail plans and specifications were prepared by Mr. R. A. Briggs, F.R.I.B.A., of 12 Norfolk Street, Strand, London, W.C., and the work during construction will be probably supervised by a local architect.

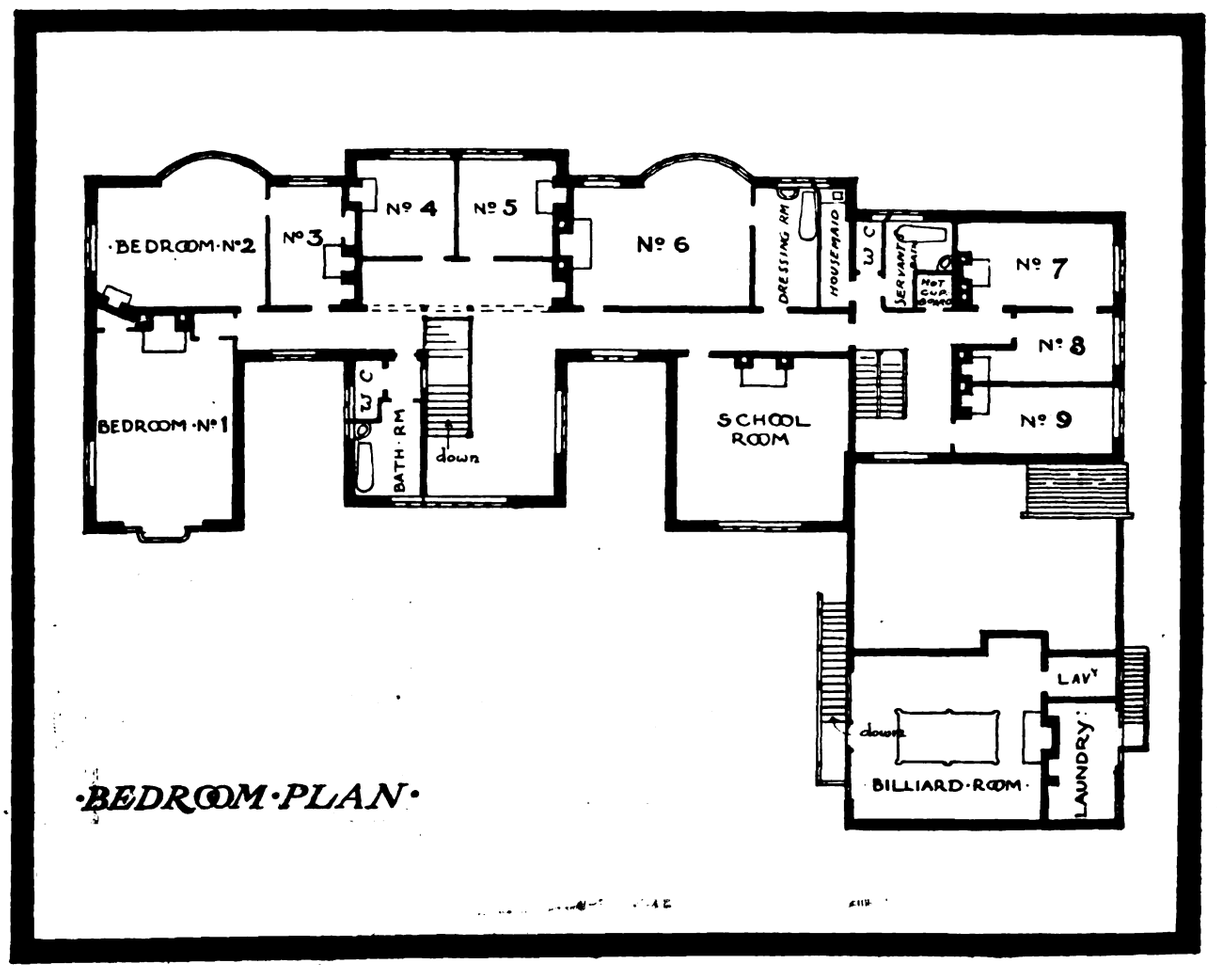
The Foundations of a Roman villa have been discovered on the marshes near the new pleasure ground, Northfleet. It lies on the property of the Associated Portland Cement Manufacturers, Ltd., in a locality where the firm are excavating chalk. In the interests of research, the firm has deputed a workman to carefully excavate the spot under supervision. One or two rough red tile pavements, many fragments of pottery including ornamented castor vases, and a Roman well 12 feet deep, leave no doubt as to this having been the site of a Roman settlement. Officials of the British Museum have been invited to visit the locality.



RECTORY AND PARISH ROOM, GLYNDON—PLAN.

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ALLANGATE, RUSTINGTON, SUSSEX—PLANS.

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"ALLANGATE," RUSTINGTON, SUSSEX: ENTRANCE FRONT.

R. HEYWOOD HASLAM, Architect.

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"ALLANGATE," RUSTINGTON, SUSSEX: GARDEN FRONT.
R. HEYWOOD HASLAM, Architect.

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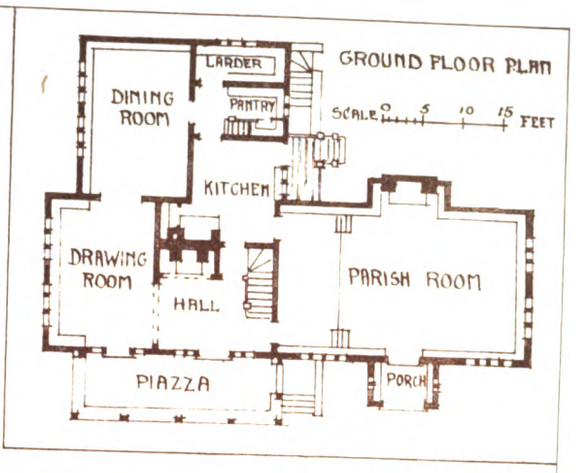
RECTORY AND PARISH ROOM GLYNDON Nr BALTIMORE U.S.A.

R.A. Briggs F.R.I.B.A. Archt. 12 Norfolk St. Strand London W.C



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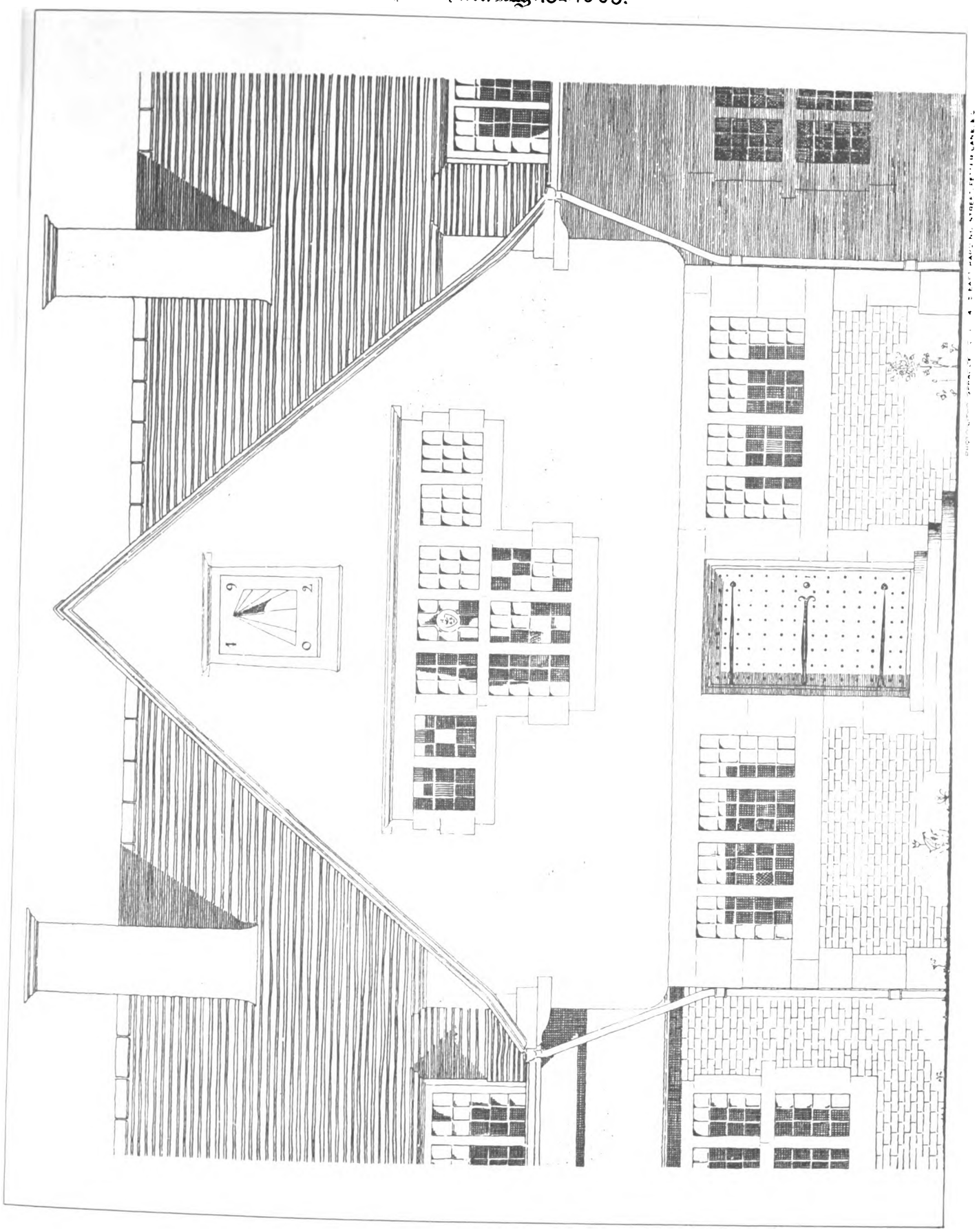
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"ALLANGATE," RUSTINGTON, SUSSEX: FRONT ENTRANCE GABLE

R. HEYWOOD HASLAM, Architect

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"ALLANGATE," RUSTINGTON, SUSSEX: GARDEN FRONT.

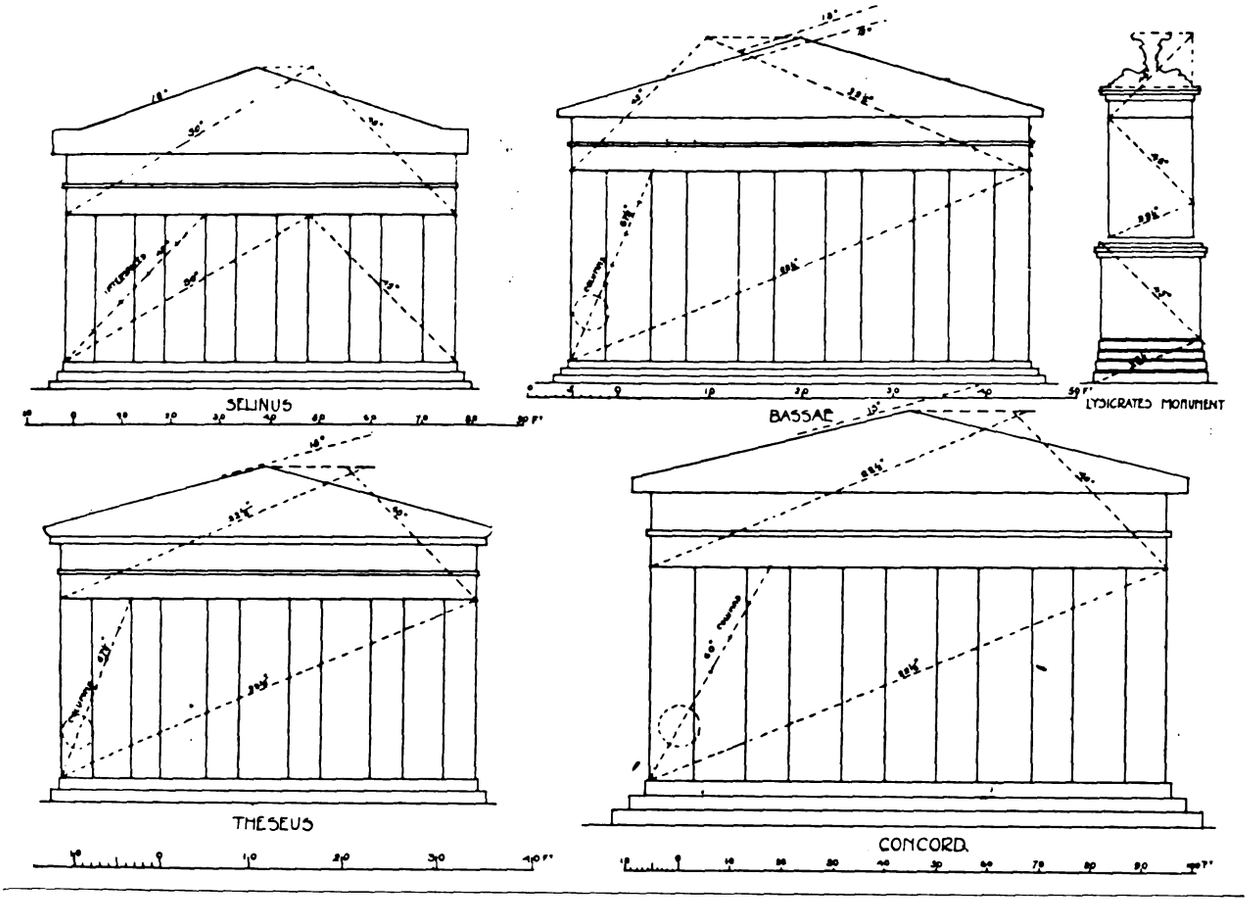
R. HEYWOOD HASLAM, Architect.

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THEORY OF THE APPLICATION OF ANGLES IN GREEK ARCHITECTURE.

By G. S. Aitken, Architect.

I AM indebted to Professor Baldwin Brown for a suggestion to try and find how far the assumed geometrical system of Classic design applies to hexastyle as well as other forms of Greek temples, and, as may be seen from the accompanying diagram, the result is so remarkable as to place beyond doubt such as the Greek practice.

It will be noted that in two of the cases illustrated the diameters of the columns seem to have been determined by angles of 67½ degrees (the complement of 22½ degrees); a third case gives 60 degrees as the basis of division, and the fourth that of 45 degrees as settling the intervals between the columns instead of their diameters.

It will be observed also that in the two 67½ degrees instances the angle fixes the widths of the outer intercolumniations, which in these cases are narrower than the intermediate spaces.

If the Greeks used this system of angles we may conclude they did not take foreshortening into account, or make any correction for it in the mass at any rate, whatever they may have done in detail, and this seems reasonable, as they could only have arranged for corrections suiting one point of view. Their effect would be lost as the spectator moved, and, in fact, would have led to distortion in all other positions than the one for which they provided.

The question still remains for answer, wherein lies the virtue of this system of angles? Well, in this way: they are proportional parts of a right angle that in its turn is a proportionate part of a circle, which, as a geometrical form, embraces all created things. They may therefore be considered as representing something higher than human thought, although the Greeks might not know it, and as such are worthy of respectful consideration. If an architect could approach the standpoint, in however a modified degree, of the great Designer and Former of all (all other things being taken into account), his work would be correspondingly better than that of the man who stood far off on the line of approach.

And so we find the Mediævalist came nearer to the centre than the Greek in his use of the equilateral triangle—the symbol of the three Divine Persons who all had their part in the work of creation; the architectural result was nobler and more aspiring, attaining its greatest in the altitude of Early Pointed, descending in the later phase of Perpendicular, and reaching its lowest in the time of the Renaissance, when pure intellect and humanism shut out the "spirituelle."

There is a quaint motto over the door lintels of many old Edinburgh houses, "Except the Lord build the house they labour in vain who build it," which, though it may not have been intended as an architectural allusion, is worthy of reconsideration in the present day; and we may find after all that the law of three as a counterpart of the Three Persons of the Trinity has its place in architecture after all.

TOWN HALL, CIRENCESTER.

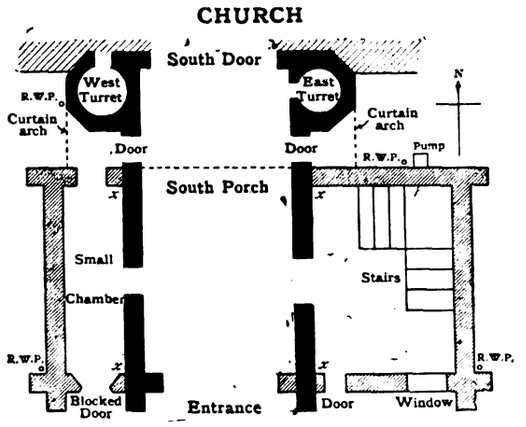
THE thirty-second annual report of the Society for the Protection of Ancient Buildings is a booklet of a hundred and twenty pages, nearly a hundred of which treat of various buildings that have come under their notice during the past year. The committee state that the work of the Society is seriously handicapped by lack of funds, and in consequence they are most anxious that the membership should be largely increased during the current year. Amongst the many schemes that have been carried out in consultation with the Society was the repair of the town hall at Cirencester, Gloucestershire. By permission we reprint the following detailed account of how the work was executed:—

The building consists of the south porch of the parish church, with a small chamber on one side and a staircase on the other, and above, over these, at the first floor level, a large room, now open to the roof (but probably formerly floored at half its height), which at one time was used as the council chamber of the Town Council. This chamber occupies the southern portion of the building. The northern part, that abuts upon the south wall of the church, contains a small chamber, and a kind of gallery over it approached by a turret stair on the west. This lower small chamber communicates with the porch by an east turret, which externally is complete up to the roof, but internally has no steps above the first floor level. The west turret communicates directly with the church, having a door into the south aisle.

The sketch plan shows the disposition of the parts of the building—the council chamber being south of the dotted line. The shaded parts are later work than the dark, showing that the original building was the south porch with the two turrets, perhaps carried up with parapets and leaded roof to the sill of the short window on the south door of the church. No actual trace of such a roof was found, but that the ad-

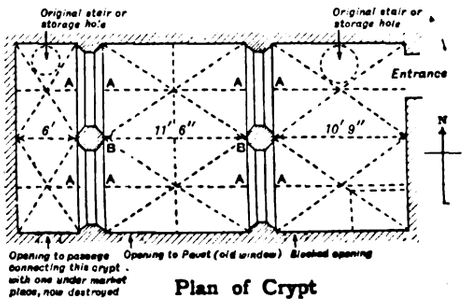
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joining chamber and staircase were built later is proved by the straight joint in all four points of their attachment to the walls of the porch (marked on the plan *xxxx*).



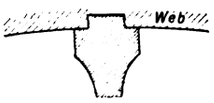
Ground Plan.

Beneath the old town hall is a crypt, its walls being under these later-added walls of the staircase and small chamber, while stout stone arches carry the side walls of the porch. The crypt is vaulted in stone, with rather obtuse pointed arches. The vaulting is divided into three main parts, corresponding with those above, and the diagonal and transverse ribs have the appearance of being later than the arches that carry the porch walls. For example, the horizontal ridge ribs, where they run to the apex of these arches, are not finished so as to die on to them, but are butted up to them. (See "A" on plan of crypt.) The springers on the transverse ribs beneath the porch are apparently also let



Plan of Crypt

in to the piers of these same arches (see "B" on plan of crypt), and have a straight joint above, so that the vaulting of the crypt appears to be an insertion, later in date than the arches that carry the porch walls. It is probable that this was a contemporary revision. The vaulting ribs are large and simple in profile, and are cut, English fashion, to take the web thus—



which is very well built in thin laminated stones and plastered with a coat of pure lime about $\frac{1}{8}$ inch to $\frac{1}{4}$ inch thick.

At the time when the works of repair were taken in hand, the large arches under the porch walls showed signs of crushing, the soffits having been pinched at the joints so that two or three large pieces of stone had spalled away.

The walls of the crypt are of small stones and the joints were soft and open. These were wedged up with slates in cement and flush-pointed with lime mortar. The masonry of the north-west corner wall of the crypt appeared to be very loose and was cracked; it was found to be saturated with water arising from the pump and from the rainwater pipe outside. The defective work was all taken out and rebuilt in cement with large bonding-stones and concrete.

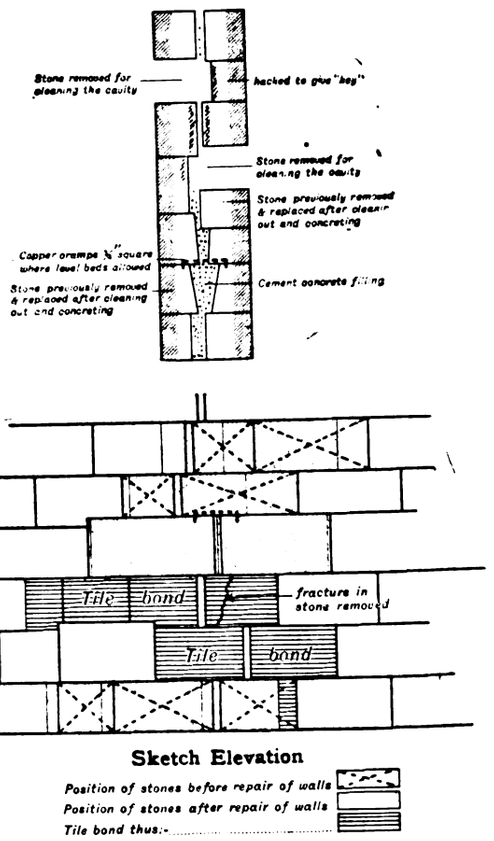
The vault ribs in several places had dropped slightly, and so had parted from the web. These were supported either by copper hooks let through from the concrete filling above, and down through the stones, or where the length of rib and character of the damage required it by inserting steel joists from wall to wall and from them suspending similar hooks of copper, the whole being thoroughly covered in breeze and cement concrete, and the steel joists painted.

The walls over the arches being made sound, the porch walls were examined and found to be built without any bonding stones from face to face, but, as it were, with an inner and outer surface wall, filled in with lime mortar. The filling was completely dry and loose and the walls showed many large cracks, some being as much as $1\frac{1}{2}$ inches wide from the top to the bottom of the walls. Also, the thrust of the vault of the porch had pushed out the walls about four inches on each side, and thus the vaulting stones were loosened and the arches broken.

The outer—i.e., the west and east outer—faces of these porch walls, when the whitewash had been removed, showed that at one time they had been exposed to the weather.

These porch walls were repaired by removing stones at intervals from each side and cleaning out all the loose core, then thoroughly washing out the cavity and chipping over the backs of the face stones, and then filling in with cement concrete sufficiently fine to ensure its filling all cracks and interstices up to the level of the uppermost stone removed; and so on, working up and over the entire wall from the floor of the porch to the vault and wall top.

Tile bonds, twelve inches or more in depth, according to the height of the stone courses, were inserted on the outer faces of the walls, across the cracks, and the bonding of the stone courses was altered where possible so as to bridge the cracks and form a sound bond. The following diagrams explain this:—



Sketch Elevation

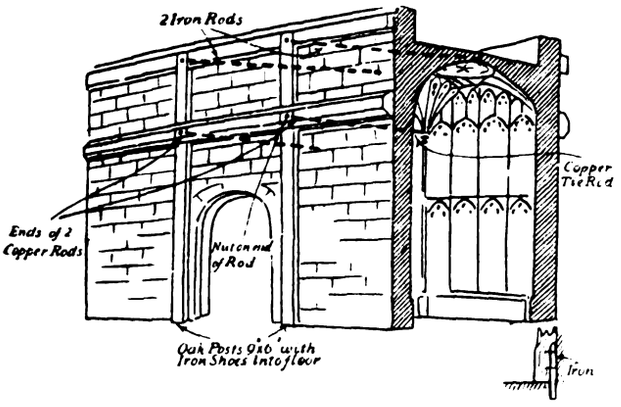
During the progress of this work the porch vault was carefully supported, and when the repairs to the walls had been finished the vault itself was taken in hand.

Examination had shown that this had been supported—probably in 1831, when the building was largely restored—by an oak framework laid on the top of the porch walls, from which depended iron hooks passing through the vault stones and thus hanging them to the framing. It was found that this framing was pressing on the crown of the vault, and that in some places the floor joists of the council chamber were in turn resting on the framework. The method of support of 1831 was adopted and strengthened, the framing raised clear of the vault, and the floor joists re-arranged so as not to rest anywhere but on the walls.

Steel joists from wall to wall were made use of to support the oak framework, three being laid across above it—in the thickness of the floor joists—and the framework hung from them in much the same way as the stonework had been hung from the framing. Additional copper hooks were used as support to any stones that required it. The joints, stoppings and pointing of the vault were all cleaned out and refilled with lime mortar; in the very large joints small pieces of tile were used. The back of the vault and all the open joints were washed thoroughly clean before repointing; and, finally, the pockets of the vaults were filled with breeze-concrete.

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The side walls of the porch were further supported by a framework of oak beams outside the walls, tied together by two hardened copper rods, 1½ inches square at the springing



level of the vault; while above the vault two round iron rods, one inch in diameter, connected two oak plates, nine inches by nine inches.

The copper rods were then painted stone colour and the floor above relaid with screws to prevent jarring the new pointing.

At the same time as the work of repairing the crypt and porch was proceeding, the three oriel windows on the south front and the parapet were being mended and replaced.

Examination of the windows had shown that they were built on large, strong corbels, of which the inner ends were flush with the inside of the wall. Above these the oriels are built up to the glass level in thin panelling stones, about seven or eight inches thick, with broader string courses at intervals. The windows themselves show three faces, and have stout angle mullions and small inter-mullions crossed with transoms, and, at the half way, with a broad band of quatrefoil work, this being the space between the windows necessitated by the floor dividing the original lower and the upper small chambers, alluded to above.

At five different levels in the whole height of each window had been built a cross bar of iron passing through every mullion, and at either end bedded deep into the walls, the ends themselves turned down cramp fashion, the three lengths being connected by a great hook and eye joint at each angle mullion. These irons had corroded very much, bursting the stonework away from them and causing much dilapidation to the mullions. The mullions were mended with hand-made plain red roofing tiles in cement, and, where possible, portions of the stonework which had split off were re-used.

In order to obviate the recurrence of similar damage, all the iron stanchions and cross bars, where they entered the stonework, were spliced with copper, which at once preserved the old iron bars and stanchions—greatly to the advantage of the appearance of the building from the street—and made an efficient and strong tie round every oriel window, for the tie was continued as before and bedded in the main walls.

At the old floor level, just over the head of the lower half of the oriels, a band of iron had been built in, and this had burst off all the stonework inside the window. The iron was entirely removed from all three windows and replaced by copper in the central window only. Tile lintel-ties were carried across all the oriels at this level. The work at this point became very difficult and dangerous, in the central window especially; but it was accomplished without any crack or settlement. Two bands of tiles were carried round each oriel inside, cutting as deeply into the walls of the oriels as their thickness permitted without showing on the face.

The walls below the glass level were cramped, repaired, and strengthened, while over the whole area of the south wall, including the three oriels, was built a tile lintel twelve inches deep, the ends returning eight feet into the end walls, thus tying back the south wall to the main building.

All broken mullions and tracery were cut out and rebuilt in tile-work in cement, the tiles being cut to the profile of the moulded stones.

Other parts of the front wall, such as the bonding of the buttresses, were found to be defective, and these were dealt with severally.

The entire parapet had been removed previously to the Society taking the case in hand, and the stones were stacked in the churchyard beneath the tower. No key was obtainable as to the meaning of the numbers, partly obliterated and many in duplicate, which marked the various pieces; so that the whole had to be reconstructed from the existing stone sill and from a large and clear photograph taken twelve or fifteen years ago. By means of this photograph stones were identified—even by tiny sand holes and other unevennesses of surface—and finally, with great patience on the part of the workmen, practically every stone was replaced in its original position. In a few cases the stones were so badly broken that they had to be made good with tiles in cement, plastered; and a few single mullions were replaced with new stone.

Where the stones were short in length, tiles were used to build up to them; and copper dowels and cramps and slate dowels were freely used. Two copper rods were built in to support the north-east pinnacle, and two stone buttresses were built across the gutter behind the parapet on the south front, to strengthen it. Some of the pinnacles were badly broken, and were mended with cement concrete; and copper dowels were used in replacing crockets, &c.

The turret stairs were carefully examined and repointed and the joints cramped where necessary. The curtain arches abutting on these turrets had iron ties bedded over them in the walls that form the ends of the dais in the council chamber, with similar results to those in the case of the oriel windows. These irons were cut out and tile bonds inserted from the inner face of the turrets to twelve inches into the walls of the town hall.

The timbers of the roof were examined and the roof itself tied back to the framing of the north wall by iron rods and by irons bolted to the posts and plates of the gallery. The lead roof was repaired, and the gutter on the south front taken up and relaid.

Finally, to protect the external surface of the stonework, it was given three coats of baryta-water, the last being mixed with lime, a little colouring matter being added to temper the hard, white effect which would obtain until the work had become weathered.

A stone inscription commemorating the work is to be placed in the town hall.

REINFORCED CONCRETE.*

Historical.

THE author is fully aware that when dealing with a subject such as "Reinforced Concrete," which is described by some as being "comparatively new," it is customary to preface any remarks with a brief *résumé* of its history, and it is proposed to follow this time-honoured custom, but the reason for so doing is entirely different from that which usually prompts such remarks. Engineers are not greatly concerned with the actual history of the rise of reinforced concrete as a material to be reckoned with in very many branches of their profession, interesting as such history undoubtedly is, but they are most decidedly concerned in obtaining definite proofs of its lasting qualities, and it is only by looking backwards that any reliable data can be obtained as to this.

Firstly, reinforced concrete is not the "new thing," the "experiment," the "unknown quantity" which it is so frequently and erroneously described as being. Of course there are new forms and uses of it which we have not yet been able to test by time as to their durability, but these only represent phases of the development of the material as a whole and do not affect the main question of depreciation, upkeep, reliability, and similar important matters. It is a fact well known to all those who have studied this question, even superficially, that there were important structures in reinforced concrete erected in London in 1889, and which are still in use, and on the Continent can be seen equally large structures successfully built twenty-five years ago and also still in use without having been strengthened or "patched up." It may probably be said that the above instances, being buildings or houses, are not very conclusive evidence to engineers, as they would probably never be loaded up to even the safe loads for which they were designed, and the area of their foundation-plan is practically equal to that of the buildings themselves, and also that they are not subjected to much vibration. We will therefore take the case of bridges, which are subjected to great vibration and the foundation area of which is very much less than that of the whole structure, and we find that there are numerous instances of bridges in reinforced concrete built more than ten

* A paper read at a meeting of the Institution of Mechanical Engineers at Liverpool by Mr. Arthur C. Auden, July 1909.

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years ago which are still in as good, or better, condition than when first put up. The author does not refer to narrow-span bridges or culverts, but to those of fair spans such as the Eslingen Bridge over the River Neckar with a 60-foot span, fourteen years old, and over the same river at Ybbs with a 140-foot span, twelve years old, the Chatellerant Bridge, 153-foot span, eleven years old, and the Prince Rupert Bridge at Munich with 191-foot span, and ten years old. Instances could be multiplied to a great length, but the author thinks that even these few preliminary remarks will be sufficient to prove conclusively that no one need be "afraid" of reinforced concrete, as it has entirely passed out of its experimental stage, and though failures have occurred through bad design or workmanship, there is no doubt that their proportion is wonderfully small to the total amount of work done—in fact the reinforced concrete "scrap-heap" is the smallest of any material with which we are familiar.

Materials.

An important point in connection with reinforced concrete frequently presents itself, namely, as to the nearest place where the materials, such as sand and gravel or chippings, can be obtained, and it is a question well worth close consideration because in nearly all instances the cost of the proposed structure will be of course affected by the cost of its constituents, and these are in turn much influenced by the cost of freight and carriage. From this particular standpoint it is proposed briefly to classify the materials, as it is by no means uncommon to find that, within reasonable limits, we can, by slightly altering our design, use cheaply-obtained aggregates without in any way materially affecting the use and efficiency of the proposed structure, provided of course that the said structure is not of an ornamental design and does not contain much fine work.

From the above standpoint, therefore, the author will consider, firstly, the stone, that is, chippings or gravel.

In many places the Eastern Counties flint is practically the only stone locally obtainable, but though this makes good, tough concrete, it is unreliable for fire-resisting purposes owing to its tendency to crack and "fly" under heat. The proposing user must, therefore, balance his reduction in capital expenditure by a slight increase in his fire-risk. It is interesting, however, to know that this tendency to crack under heat can be much reduced by passing all the stones through a crusher, as practically all flints have their crystallisation definitely bounded by planes along which they always break, the remaining portions between such planes being comparatively homogeneous, with but little tendency to "fly."

The same remarks apply to limestone, but it has not the redeeming feature of being more fire-resisting after being broken; in fact, it is not advisable to be used at all where fire-resistance is an important consideration, as it is very apt to disintegrate to powder under the action of heat, but it is not to be condemned entirely as it is quite a serviceable material apart from increased fire-risk. It must, however, be remembered that it almost always needs washing before use, as, after breaking, it will generally be found to be covered with fine, blunt dust, which prevents the cement properly bonding with it; the expense of this washing must, therefore, be set against the cost of other slightly higher-priced stone which can be used as received.

Sandstone can be obtained in many parts of the country in almost unlimited quantities, but as a rule it is too soft, too porous, and too absorbent for use in reinforced concrete work. Samples should always be taken and tested by crushing, and if it is found that it will stand about 1½ tons per square inch, and that the difference in weight, when clean and dry, and after being two days under water, does not exceed 8 per cent., it may be safely used.

Quartzite stone is fairly good if not too soft and open in texture, in which case the same precautions apply as for sandstone.

With reference to testing for crushing strengths of either stone or concrete, it must be borne in mind that reliable results cannot be readily obtained by crushing small pieces, say of only about a square inch or so in area; it is always advisable to use larger test pieces, say such with an area of at least 10 or 12 square inches.

As we are considering the subject of aggregates from the standpoint of disadvantages versus cheapness, it is not necessary to allude to the numerous other stones which are quite suitable for reinforced concrete work, such as granite, basalt, millstone grit, breccia, diorite, trap, &c., although there are inferior qualities of them all, but which, as a rule, it does not pay to use.

With reference to what may be called artificially-produced aggregates, broken earthenware and stoneware from the Potteries District make quite a good aggregate, but those who have not had experience with this material for reinforced concrete will be disappointed to learn that the same must be unglazed, thus preventing the use of the many hundreds of tons of broken crockery now existing in some of the older Pottery towns, as the glaze prevents the proper adhesion of the cement, but doubtless this difficulty will be surmounted in time. When using unglazed earthenware such as broken "saggers," care should be taken that the thick and thin pieces are, after being broken to pass the proper gauge, carefully mixed with each other, as a quantity of thin flat pieces together are apt to form beds or planes which are a source of weakness; under any circumstances it is always better to mix some chippings or gravel with all broken earthenware.

Burnt clay and gault are quite permissible materials, provided that they are tough and hard and do not soften or "crumble" after being left in water for two or three days.

Speaking generally, broken bricks are not a good aggregate for reinforced concrete, although they have given excellent results in mass-concrete. They are usually too soft and yield too much blunt dust and have frequently old mortar adhering to them; if, however, they are hard and close in texture and free from mortar they may be safely used.

It is well known that coke-breeze makes an excellent class of concrete, but it must be remembered that such cannot be regarded as being really fire-proof, although some recent tests by the British Fire Prevention Committee, to which reference will be made later, show that this material can "hold its own" very well in this respect; but from its nature it is much less capable of resisting either tensional or compressive stresses than harder and tougher materials, and the question of sulphur is also present. It is, however, quite possible to design a structure in such a way that—omitting the question of the best fire-resistance—a large portion of it can be made with reinforced concrete composed of this usually cheap and readily-obtained aggregate.

There are very few manufacturers or mechanical engineers who do not make ashes and clinkers, and many have to pay to have them removed. It is, however, quite possible with care to obtain two decidedly serviceable forms of aggregate from these, one being the ashes, which are very similar to coke-breeze, and the other the hard-burnt clinker; but, as with all other materials except the real stone aggregates before mentioned, discretion must be used in the selection of any which are derived from waste products, such as are now under consideration.

In the case of ashes, only those that will float in water and which are of a uniform colour and texture and quite free from adhering pieces of coal and dirt should be used, while with clinker only that which is really hard and clean is serviceable. In both cases, if the washing and riddling or screening are carried out as one process, a more reliable result will be obtained. The question of sulphur must, however, be carefully watched.

Slag from furnaces, whether blast or cupola, makes also quite a good aggregate, provided it is hard and tough and free from dust and its sulphur contents carefully noted.

As is well known, all clinkers, breeze, slags, &c., contain a certain amount of sulphur, which is apt to attack the reinforcing steel with disastrous results. The maximum allowable percentage of sulphur in reinforced concrete aggregates is now being made the subject of tests and experiments—as in fact are all other details in connection with reinforced concrete—and it is to be hoped that an authoritative statement on this subject will shortly be issued, as it is of considerable importance to engineers, particularly to those who have slag heaps of any considerable size; but there is an important point in connection with the presence of sulphur—namely, that if it is in the form of "sulphate" it is practically harmless, but if in the form of "sulphide" it is very deleterious, and anything more than a very small amount indeed should not be allowed.

Care should also be taken with all artificial aggregates that no free lime is present; but, as in the case of sulphur, there are two forms of this material present, one the free lime referred to which is dangerous, and the other carbonate of lime which is practically harmless. It must be noted, however, that washing and exposure to the air and sun will do much to convert the dangerous sulphide into the comparatively harmless sulphate and exactly the same is true with reference to the harmful free lime and its practically safe carbonate. Unfortunately, quite good and accessible aggregates containing lime or sulphur are sometimes con-

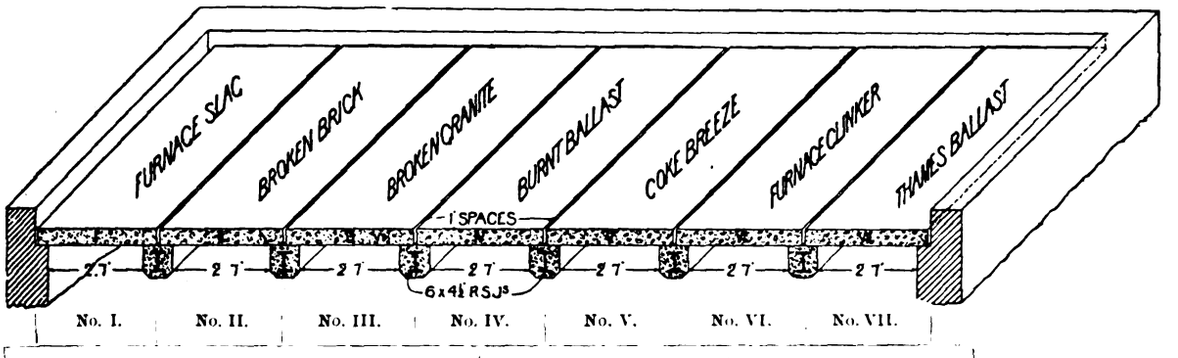
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demned en masse because no discretion is exercised as to the form in which such occur.

Mention has already been made of the washing and screening of aggregates, and it may be of interest to note that "jigging" is a much better method than throwing against an inclined sieve or screen; it has the advantage also of enabling the washing to be done simultaneously with the screening, and also—particularly in the case of the artificial aggregates—jigging knocks the weak corners off and produces better-shaped pieces.

Before leaving the subject of aggregates the author would draw attention to the recent important fire-tests, made by the British Fire Prevention Committee, of concrete composed of various descriptions of material, the proportion of cement, sand and aggregate being identical in each case, i.e. 1-2-3, except with the burnt clay and coke breeze, where there was no sand, the proportion being 1-0-5.

FIG. 1.—*Arrangement and Results of Experiments by the British Fire Prevention Committee with Concretes composed of various aggregates.*



No. I.—Top:—Slab cracked across in two places.
Underside:—Curved downwards ¼ inch; slight cracks visible.

No. II.—Top:—Slab cracked across in three places; slight curve downwards.
Underside:—Curved downwards ¼ inch; slight cracks visible.

No. III.—Top:—Slab cracked across in three places; curved downwards about ½ inch.
Underside:—Curved downwards ½ inch; no cracks visible; about 1 inch washed off by water.

No. IV.—Top:—No cracks; not curved downwards.
Underside:—Not curved downwards; no cracks visible; about 3 inches washed off underside (in parts) by water.

No. V.—Top:—No cracks; not curved downwards.
Underside:—Not curved; no cracks visible; about 1 inch washed off underside (in parts) by water.

No. VI.—Top:—Slab cracked across in two places; curved downwards about ⅛ inch.
Underside:—Not curved; one slight crack visible; pitted in places about ¼ inch deep by water.

No. VII.—Top:—Slab cracked across in very many places; curved downwards about 2 inches.
Underside:—Curved downward 1½ inch; and bad cracks all over in all directions, mainly longitudinally; much washed off by water.

The illustration, fig. 1, kindly supplied by the British Fire Prevention Committee, shows diagrammatically the arrangement of the test which was simultaneous and exactly the same for all the slabs, which were all uniformly loaded to 224 lb. per foot super. The remarks printed beneath each slab are of much interest as showing the behaviour of each material after being quenched with water when practically red-hot. The slabs were all 10 feet by 2 feet 7 inches clear span. Engineers will be interested to know that the furnace clinker mentioned was obtained from off the bars of an ordinary steam boiler, not from destructors.

Sand.

Sand is, in some parts of the country, more difficult to obtain than any other constituent of reinforced concrete. A certain amount is absolutely necessary, and nothing up to the present is known which really and entirely supplies its place. Engineers having foundries will have a ready means of judging sand for reinforced concrete if they remember that, generally speaking, the better sand is for moulding, the worse it is for reinforced concrete. For instance, it must not "bind"—that is, retain any shape when compressed—and it must be incapable of being smoothed with a trowel to a bright surface, or of "standing up" by itself when cut with a shovel; these being "rough-and-ready" methods of ascertaining that the sand has what is required—namely, large sharp grains. Dirt in the form of slime, mud, or vegetable refuse is distinctly bad, but a little loam, enough to soil the fingers when lightly rubbing the sand between them but not enough to make the sand itself adhere to them, is no detriment. Small particles or nodules of clay do not appear to affect the strength of the concrete, provided they are very small both in themselves and in number, but they are not an advisable ingredient and should be avoided if possible, unless there is ample time to mature and test sample pieces of concrete made with the sand containing them.

If sand is scarce or costly some economy may be effected by regarding the very small pieces of the stone or other aggregate below ¼-inch mesh as sand, and mixing them with some real sand. The economy is not so apparent as appears at first because the small pieces must be screened out from the larger aggregate, and in most instances washed to remove the floury dust before being mixed with the real sand ready for putting in the gauge-boxes. It is not good practice to use the stone aggregate and its smalls and dust and some sand upon the chance that they will be in the proper proportions and that the voids and spaces will be properly filled. Experience has shown that this is usually not the case, and although this frequently is the practice with mass-concrete, it should not be allowed in reinforced work, where absolute homogeneity is so essential.

Cement.

With reference to cement there is nothing to remark, as most excellent descriptions of this material are obtainable anywhere, but it should not be one of the many mixtures imported into this country as cement, which do not deserve the name and are costly at any price. Any user is safe if he insists that his cement shall pass the British standard specification in every detail, and that it is purchased from a reliable manufacturer.

Reinforcement.

Since the issue of the first patent with reference to reinforced concrete in 1831—which it is interesting to note was to an Englishman, and, as far as the author's present information stands, this patent out-dates all others in any country—the number of patent systems, forms and methods of reinforcement have been very great, of which many survive. However, it is not now proposed to enumerate the various systems, whether patent or otherwise, but only briefly to draw attention to the advantages and disadvantages of such in each particular instance.

Firstly, it may be said that practically every one of the many systems at present in use has good points in which it is superior to others, but it is also certain that no one system has the monopoly of being the best in every instance and in every form of construction; for example, that which is exceedingly good for beams is inapplicable or unnecessarily costly for use in flat surfaces, and the same may be said as regards others for use in columns and not in arches, and so on.

Secondly, it is frequently cheaper to sacrifice a little of the theoretical efficiency of any method for the sake of ease of handling upon the actual work in progress, as all the metal in reinforced concrete being covered up, any error in position due to misplacement or to any part having become loose or driven or shaken out of place when the surrounding concrete is being punned cannot be seen and put right. It will therefore be readily recognised that any methods involving loose pieces, or such fastened together at many points with small diameter wires, are not so efficient in actual work as those where all the parts are rigidly fixed together.

It is also important that all reinforcement should be so designed as to possess a considerable amount of initial

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rigidity, so that it does not "sag" or "warp" or "twist" when placed in position in the mould-boxes. Many illustrations regarding this could be quoted, but that of compression-bars, intended to be above the neutral axis in a beam, sagging down by their own weight till a portion of their length is below the said axis, where it is worse than useless, is not by any means as rare as it should be. The same remarks apply to lateral misplacement, particularly in the case of columns and struts, as well as to the pitching and spacing of reinforcing bars or metal on flat surfaces, such as floors, walls, &c. In these last-mentioned it is practically essential to have the bars or metal so designed that it cannot be knocked out of place, as it is almost impossible to keep a number of separate loose bars in proper pitch; it is advisable, therefore, that all reinforcement for this form of work be woven together as shown in fig. 2.

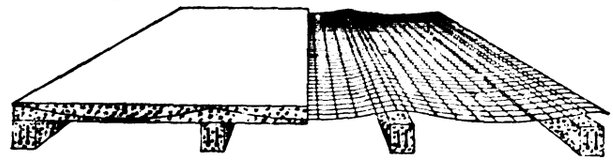


FIG. 2.

Reinforcement of Flat Surfaces: Wires or Rods held in pitch by weaving.

Punching or slitting solid plates into strips or bars is another efficient form of reinforcement for flat surfaces, particularly for those which are approximately square in plan—viz. where the strains are practically equal all over; but for flats where the length is considerably greater than the span a wire meshing is cheaper, as the cross-span wires take the load, the longitudinal ones being only necessary to keep the others in pitch, and it is not advisable to pay for metal and strength in the longitudinal direction where it is not wanted.

Auxiliary Tension Members in Beams and Slabs.

An examination of all the accepted specifications for the last ten years dealing with reinforcement, or a reference to the advertisement pages of technical journals, will show that it is almost universally acknowledged that these important accessories must be inclined to the main tension-bars, and not be at right angles thereto, and also that such bars must be so designed as to retain absolutely their positions where they are connected to the main tension-bars, and cannot be slipped or moved along the same when ramming the concrete or otherwise. The reason for this inclination will be readily seen on examination of a slab breaking under a test load. It will be seen that the cracks are not normal to either the neutral or transverse axis, but are at an angle thereto, and it is known that the most efficient way of preventing any two surfaces from coming apart is to spike them together with a nail at right angles to themselves. This reinforcement is therefore designed so as to pass through the weak portion of the beam or slab where cracks are likely to occur, at right angles to such cracks (or planes of rupture), this reinforcement being, of course, in addition to the main tension-bars taking the main tensional stresses below the neutral axis of the beam. It is not such good practice, though frequently exceedingly convenient, to obtain auxiliary tension members by means of placing a large number of rods or bars in the bottom of the beam and bending up the ends of them at various points, although by this means the desirable inclination above mentioned is gained, but this design involves a considerable excess of metal at the centre of the beam, and a greater weight of steel than is required must be purchased.

Reinforcement of Struts and Columns.

There are two very distinct methods of reinforcement in use for these—one being that in which the vertical bars are prevented from spreading by being spirally wound with rods or wire, and the other where the same end is obtained by means of rings or loops of wire tying the vertical bars together, such loops or rings being arranged at various distances apart to suit the design and strength desired. Both these methods have good and bad points, each one being the best under appropriate conditions.

The spiral winding has given most excellent results, and is considered by many to be the best for columns, &c., as it permits the use of lighter and fewer vertical rods, but it has the disadvantage of being somewhat difficult to make it a "good mechanical job"—that is, so that the spirals shall all be the same diameter and parallel in bore, otherwise some will clasp the group of vertical bars too closely and others hardly touch them, which results in unequal stresses. This is, however, generally made much easier by using bands of flat rectangular section which bend readily, and by first winding the spirals on a cylinder and then slipping them over the vertical bars when made. Great care must be taken when using spiral reinforcement in vertical columns that it is not made in too long lengths, as all the concrete has to be put in from the top of each length, and it is well known that when concrete is dropped from even a small height the mixture of its constituents becomes very uncertain. Care must also be taken that each length of spiral is "corkscrewed" well into the one below it, as otherwise there is a plane of weakness between each length of spiral. This form of reinforcement must be so designed that the required strength is obtained without the pitch of the spiral being closer together than the size of the largest pieces of aggregate used, as if it is so the stones become jammed between the coils and a lack of homogeneity is the result. In the one case of a column being tested to destruction it is very interesting to note that, notwithstanding the concrete being of the highest quality and very carefully matured (being nine weeks old), it failed before the vertical reinforcement, which was not broken. In the column the vertical rods were ¼ inch and the spiralling ⅛ inch in diameter, and the column itself 12 inches outside diameter. The spiral binding, however, does not always break before the vertical rodding.

The second method of column and strut reinforcement above mentioned—namely, loops or rings slipped over the vertical bars and held at the proper distance apart, as shown in fig. 3—is also an excellent one, especially when the loops are carefully made mechanically on hard metal formers, so that each one is an exact replica of its neighbour, the result being that each one equally clasps the group of vertical bars, otherwise should one be tight and the other slack the bursting strains will not be taken up by all the loops in equal proportions. As the first desideratum of this design of column and strut reinforcement is the prevention of the vertical rods spreading apart under the load (the loops themselves, being further apart, do not resist the bursting strains on the concrete to the same extent as the spiral windings), it is not good practice to allow the loops to be curved in between the points where they touch the vertical bars. Unless the wire or rodding forming the loop is straight between its resistance points it does not get a chance to develop its tensional strength, as it must "pull itself straight" first, which it does at a low stress. For this reason the use of comparatively high-carbon steel is often recommended for columns or strut loops, as it is stiffer to resist distortion, and as distortion is one of the main things to avoid, particularly in this phase of reinforcement, the use of harder steel, if the same can be obtained without any marked increase in cost, appears to be certainly indicated; in fact, as the elastic limit of all reinforcement is almost of as great importance as its ultimate strength, the use of bars and rods possessing considerable resistance to stretching is certainly to be recommended, provided that the said ultimate strength is not appreciably decreased. The use of high-carbon steels has been recommended for various other reasons.*

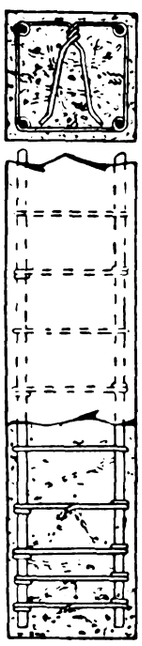


FIG. 3.

Arrangement of column reinforcement with vertical rods and loop-pieces.

It is often said that it is immaterial whether the reinforcing rods are bent or not, as, being bedded in concrete, they are immovable, and doubtless this may be true in a structure where there is no vibration and where the loads are unvarying in amount and disposition; but where it is not so, there is a tendency on the part of the concrete on the concave side of the curved pieces of wire or rodding to become friable, and this tendency should be eliminated in the design by working the reinforcement in straight lines whenever possible. It

* Mr. Charles F. Marsh, in a paper read before the Concrete Institute, stated:—"For hooped members, if the allowable compressive stress in the concrete is higher than about 1,000 lb. per square inch, it is advisable to use high-carbon steel for the longitudinal reinforcements, and the employment of high-carbon steel for the bindings is always advisable. For the purpose of resisting temperature stresses there is an advantage in the use of high-carbon steel, as its greater resistance will enable it to offer more assistance to the concrete."—*Transactions, Concrete Institute*, vol. i. page 7.

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should also be noted that all the joints of the vertical rods in columns and struts must be in close-fitting sleeves—preferably of good quality lap-welded steam barrel.

When designing reinforcement there are of course many points for consideration quite irrespective of the particular method of constructing or attaching the various parts or members, one of the principal being that all beams or floors running continuously over the tops of columns or stanchions or walls must be reinforced above their neutral axis where they pass over the said columns, in exactly the same way as they are reinforced below that axis in their clear span, as the parts in tension and compression are reversed in these circumstances. In one well-known system the bars are run along both top and bottom surfaces from end to end, but these rods or bars in the compression area are only provided as a means of keeping the shear members or loops or stirrups in position, not as reinforcement against reverse flexure nor as such in compression, this last not being needed unless the area above the neutral axis is such that it cannot stand the allowable crushing stress.

The exact position of this neutral transverse—or, more correctly speaking, diagonal—plane of "reverse flexure" has not so far been very exactly located, and it will of course vary with every variation in the distribution of the load. The present practice is therefore to design the reinforcement over the supports to overlap the ends of that which runs along the "belly" of the beam. The diagonal auxiliary shear members connected to each of the main tension-bars above

FIG. 4.

Diagram showing arrangement of reinforcing bars and shear members to resist "reverse flexure" in continuous beam.

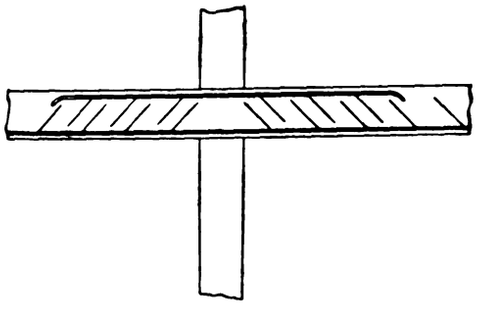


FIG. 5.

Diagram showing arrangement of reinforcing rods and shear members to resist "reverse flexure" in end of beam.

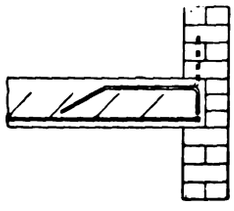
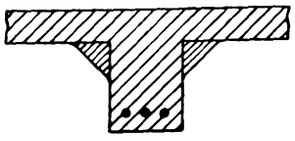


FIG. 6.

Diagram of section of beam and floor showing increased area of concrete in compression.



and below the neutral axis thus become parallel to each other, as shown diagrammatically in fig. 4, in the same way as the tension members in a lattice girder. The same arrangement must be carried out where the ends of beams rest on and in walls, and the diagram fig. 5 shows this reinforcement against tension due to the same reverse flexure above the neutral axis under these conditions. As will be noted, the ends of the bars are bent downwards into the beam itself when only the beam is in reinforced concrete, but, should the whole structure be of this material, the beams and walls consequently being all monolithic, it is better practice to bend the bars upwards as shown in the dotted lines, this being also handier, as the men can readily see, and if necessary adjust, any bar which may have been displaced by punning or otherwise.

When designing long and deep beams or girders, such as for a railway bridge with flat (not arched) spans, it will also not infrequently be found that the available area of concrete in compression above the neutral axis is such that the stress per square inch is more than the concrete will safely stand—that is, more than 550 to 750 lb. per square inch, according to the class of concrete and the nature of the aggregate used; but this is easily overcome by using reinforcement in the compression area, always remembering that the value of steel in compression is 50 per cent. less than that of the same in tension. Here also the question of rigidity to resist deformation under compression is important, exactly as it is in columns and struts, and care must be taken that all the separate members in compression are properly braced together to avoid the tendency to spread in any direction, but particularly sideways and downwards. Even with ordinary beams supporting floors this question of the available area of concrete in compression demands consideration, but the floor and beam being all in one solid piece, not only does the part of the floor immediately over the beam contribute to the desired area, but portions of the floor on each side of this are available also, thus enabling us to regard the beams as of T section, as shown in fig. 6, but, except under special conditions of loading, the breadth of floor which we can consider for the purpose of this calculation should not exceed four to six times the breadth of the beam itself, according to the class of concrete and the nature of the aggregate used. But even with this reservation, this fact of the beams and floors being solid together enables a wonderfully strong and light structure to be obtained. The same diagram also shows in closer section an additional means of obtaining this larger area of concrete in compression—namely, that of making fillets at the junction of the beam with the floor.

Another point to be remembered is that temperature stresses must be carefully guarded against, and that extra reinforcement—in fact, increased scantlings over all—must frequently be adopted for this purpose, as the coefficient of expansion of steel and of concrete is practically the same. In structures such as bridges these variations due to the temperature can be arranged for by the ordinary hinges or expansion joints (of which the latter can be very rapidly and effectively made with thick sheet-lead, the area being such that no pressure it will experience will cause it to "squeeze out"), but in the case of structures where such are impossible, as, for instance, in an exposed tank or bunker or silo, the only remedy appears to be a general increase in strength, particularly by means of increased reinforcement, and, although perhaps contrary to theory, this method has proved perfectly successful.

(To be concluded.)

NOTES ON BOOKS.

"Small Estate Management." By Albert C. Freeman. (London: Rebman, Ltd. 2*s.* 6*d.* net.)

THE author of this handbook has apparently put before him the very laudable aim of rendering the financial position of the small estate owner as sound as possible by making the property itself sound. There is throughout an air of severe practicality which commences with the opening page of the Introduction. The first chapter emphasises the necessity for system if the estate surveyor is to obtain the best results for his employer, very briefly in passing alludes to the claims of concrete for use in places where bricks have to be obtained from a distance, and gives a general sketch of the various duties that will come under his notice. A broad account follows of the Small Holdings Act, 1907, which the author anticipates will be as much a success as its two predecessors were failures. But this second chapter, as well as its supplement, Chapter V., however interesting it may be, is somewhat outside the range of the book, unless the estate surveyor can turn to account the plans given of buildings for small holdings. A highly important factor in estate management is local legislation. Of late years much has been heard of this question, and the results of the agitation are to be seen in a gradual extension of facilities which will no doubt ultimately be as wide as is desirable. There are, it must be remembered, emphatically two sides to any proposed abatement or amendment of bye-laws, and the Local Government Board have to strike a golden mean between them. The remarks on planning and construction contain a lot of concise information. The estate surveyor has generally to take things as they are, and he may often find himself unable to do more than wish he could follow the advice given in the book; but it should often prove useful to him.

"Visitors' Guide to Westminster Abbey." By Francis Bond. (London: Henry Frowde. 1*s.* net.)

This book no doubt will admirably and exactly fulfil its purpose. This being admitted, it may seem a contradiction to describe it as disappointing. But our complaint is that

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Mr. Francis Bond has thought too exclusively of the visitor who has to cram as much sightseeing as possible into the half-hour or so that can be spared for "doing the Abbey." For those excellent people there are already all-sufficing guide-books, even omitting the accounts included in the guide-books to London. From Mr. Bond we should have preferred a "Short History of Westminster Abbey," instead of a Visitors' Guide. The former would afford him scope for his highly specialised knowledge, while the latter actually shows him as nothing more than a painstaking historical investigator. In a word, what we want is more of a structural historian and less of an erudite cicerone. This wish could be easily met by the addition of a fairly long introductory chapter, giving in outline the story of the present building, of its predecessors, of its place in London and national life, not forgetting its architectural influence and interest. Mr. Bond may reply that all this is amply dealt with in his large work, "Westminster Abbey." Indeed, the opening lines of his preface explain that "The Visitors' Guide consists of the seventeenth and part of the eighteenth chapters of the writer's larger work on Westminster Abbey. It deals principally with the monuments and other objects of interest in the church and cloisters." Those who find the structure of more interest than its contents may therefore be disappointed; nevertheless, the casual visitor cannot fail to be grateful for the reprinting of these two chapters, which tell him all that he cares to know and considerably more than he is likely to remember. In addition there are thirty-two clear photographic plates, as well as other illustrations. The guide-book sets out from the north transept and most conscientiously mentions every memorial, beginning with the "big and ugly monument to the elder Pitt, Lord Chatham," and ending with "the monuments in the west aisle of this transept, which are, however, for the most part of little interest." But this is of course an unlucky starting and ending point to a splendid itinerary, in which almost every inch of the way is made to speak of its historical connections. Many are the curious pieces of information that are given. It is worthy of remark that Mr. Bond pays the scantiest attention to the great dead of the immediate past who have been laid to rest during the last fifty or hundred years in the nave and choir aisles. Generally the name only is given. Yet the names of Livingstone, Robert Stephenson, Charles Barry, Outram, Darwin, and Lord Kelvin must convey more to the minds of most visitors than those of Lord Russell, Robert Waldeby, the Duchess of Somerset or Queen Anne of Bohemia.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* issues a special number on the architecture of Princeton University, which is nearly all based, more or less closely, as regards the buildings illustrated, on the style of the colleges of Oxford and Cambridge prior to the Renaissance influence. Several firms of architects are represented—Messrs. Cram, Goodhue & Ferguson, Messrs. Frank Miles Day & Bro., Mr. H. J. Hardenbergh, Messrs. Parish & Schroeder. The unity of feeling imparted by the work illustrated is the result of an endeavour to construct a harmonious scheme, both topographically and architecturally, in place of the somewhat heterogeneous and haphazard collection of buildings with which the University grew up.

Berliner Architekturwelt gives us some further examples of the modern "new art" architecture of Berlin in the form of flats and office buildings, with a variant in the Geschäftshaus Marcus, in which conventional motifs are used with a distinctly modern handling, thus showing originality without an affected disregard of the past. Some picturesque suburban houses of moderate size and a medley of various details and parts of buildings make a relief to the more solid subject.

Der Profanbau illustrates some extensive blocks of flat dwellings with shops below at Charlottenburg, Berlin, in which a studied irregularity of grouping, partly suggested by the nature of the site, is adopted, and successfully combats the tendency to monotony that flats are apt to engender. The detail is of course "new art" but clever, and sculpture is skilfully incorporated. The Hotel Vent at Oetztal, in the Tyrol, adopts the characteristic local colour by a liberal use of wooden balconies. The Glückerthaus at Darmstadt affords an excellent example of the best type of modern internal architecture of Germany.

Deutsche Bauzeitung gives some more good illustrations, "architectural and otherwise," of Cairo, apropos of the International Archæological Congress.

A Construcçao Moderna shows how restless and incoherent is the design of some modern Portuguese domestic architecture in a house of considerable size at the corner of the Avenidas Ressano Garcia and Martinho Guimaraes at Lisbon.

Il Monitore Tecnico gives the programme suggested by the Italian section of the permanent committee for the International Congress of Architects to be held at Rome in 1911.

Arkitektur og Dekorativ Kunst has some good illustrations of the fine wall-paintings by Emanuel Vigeland in the Vaalerengens church at Christiania.

The *Engineering Record* gives a paper read before the American Society for Testing Materials by Professor H. C. Berry on "Tests of Bond of Steel Bars embedded in Concrete," which is of interest, and compares the results obtained by testing beamwise and vertically, whether "push-out" or "pull-out" methods were used. A good piece of reinforced concrete work is described and illustrated in connection with the Mont Carmel wing of the Château Frontenac, the famous hotel at Quebec.

NOTABILIA.

THE *Connoisseur* deals with the King of the Belgians' collection of old masters, and illustrates some of the examples of old Dutch and Flemish masters, about forty in number, that were sold and transferred to Paris. An interesting article is included on Mrs. Beauclerk's collection of fans. The history of English costume, by Dian Clayton Calthrop, now reaches the time of Edward III.

The *Antiquary* has a short but interesting article, entitled "A Chat about Chests and Coffers," by F. C. Hodges and W. A. Dickins, and another on "The Abbey of St. Eloy, Noyon," by J. Tavenor Perry.

GENERAL.

Among the Illustrations included in the paper on "Ware," read before the Upper Norwood Athenæum, which was reprinted in our issue of last week, was one showing the "Open Roof, Ware Priory, Herts." It should have been mentioned that the illustration was from an engraving in *The Builder* for July 21, 1849, and was reproduced by its permission.

Mr. John Wornham Penfold, of Courts Hill, Haslemere, surveyor to the Goldsmiths' Company, who died on July 5, aged eighty, left estate valued at 62,071*l.* gross. He bequeathed 500*l.* to the Surveyors' Institute, 150*l.* to the trustees of the charitable fund of the Surveyors' Club, and 100*l.* to the Benevolent Society of the Royal Institute of British Architects.

The Wimbledon Town Council last week decided, on the report of Mr. Simpson, architect, London, not to attempt to extend the municipal offices on the present site in the Broadway, but to erect new offices in some other part of the town. The proposal is to be vigorously opposed.

The Dean and Chapter of Winchester Cathedral propose to offer the famous Inigo Jones screen which formerly stood at the entrance to the choir to the Victoria and Albert Museum, London. The screen had been offered to the city authorities, but as it was not considered that the proposed precautions for its preservation were sufficient the offer was withdrawn.

At a Meeting of the Welsh National Museum Council, held at Cardiff on Saturday, the proceedings of the building committee, which met in London, were approved, and a form of advertisement was agreed upon inviting architects to compete for the proposed building.

A Ruskin Exhibition has just been opened at Keswick, and is to continue during this and the succeeding month. It was organised in its main features by Mr. Gill Parker, curator of the Ruskin Museum, Sheffield, from which most of the exhibits have been drawn; others come from Brantwood, Coniston and other private collections. In the first series of pictures from the museum at Sheffield are to be found examples of the work of a band of artists whom Ruskin had working for him on the Continent to illustrate ecclesiastic, domestic and civic architecture. They were originally intended for a projected work which was to deal with picturesque examples from France, Switzerland and Italy, including the architecture of Venice.

In View of the continued interest in the exhibition of collected works by Ford Madox Brown at the Leicester Galleries, Messrs. Brown & Phillips have decided to keep it open throughout August. The chalk drawing entitled "Convalescent," executed in 1872—a portrait of Mrs. Madox Brown—has been purchased by the Metropolitan Museum of New York.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, August 28.

Architectural Association: Camera and Sketching Club, Visit to Hayes, Harmondsworth, and Harlington.

Thursday, September 9.

Paint and Varnish Society: A paper will be read entitled "The Painting of Plaster," by Mr. W. Fourniss.

Saturday, September 11.

Society of Architects: Students' Sketching Party.
Architectural Association: Camera and Sketching Club, Visit to Guildford and district.

Monday, September 13.

National Association of Master House Painters and Decorators of England and Wales: Annual Meeting at Sheffield, September 13 to 18.

THE A.A. EXCURSION—CHELTENHAM.

(*Concluded from page* 98.)

CHIPPING CAMPDEN is a town of very great antiquity, supposed to have derived its name Campden from a congress of the Saxon chiefs confederated for the conquest of Britain, held here in the year 687. "Chipping," of course, refers to its function as a market town. In the fourteenth century Chipping Campden became noted as a staple town for wool, and was the residence of many opulent merchants, who exported a great quantity of that article to Flanders. The ancient Woolstaplers' Hall was lost to sight for many years, though traditionally one of the old houses in the town was so called. Mr. C. R. ASHBEE bought this house, and, opening up some of the parts obscured by modern innovations, discovered evidence that justified the tradition. This he pointed out to the excursionists, and explained its significance. Campden remained prosperous through the fifteenth century and until the Flemings settled in the western part of England, bringing with them the manufacture of woollen cloth to the place of production of the staple, and then gradually the prosperity of the town declined, for which combination of circumstances we have to thank the preservation of the great amount of old work that makes Chipping Campden so attractive to the student of architecture. A magnificent mansion was erected here by Sir BAPTIST HICKS in the early sixteenth century, of which only a few fragments remain, as it was destroyed by its owner at the commencement of the civil war in the reign of CHARLES I., to prevent its being garrisoned for the Parliamentarians.

The church is of very late fifteenth-century work, and is a magnificent example, large and well designed, with a fine western tower and some excellent monuments. Here the party were met by Mr. C. R. ASHBEE, who described the building and afterwards escorted them to his own house, the ancient Woolstaplers' Hall, and the workshops of the Guild of Handicraft, which have been removed hither from Essex House, Mile End. All too little time remained for sketching—in fact, days rather than hours can be profitably spent at Chipping Campden in the study of old work of various dates from the fifteenth to the seventeenth century, and a return was made to Cheltenham by rail from Campden station.

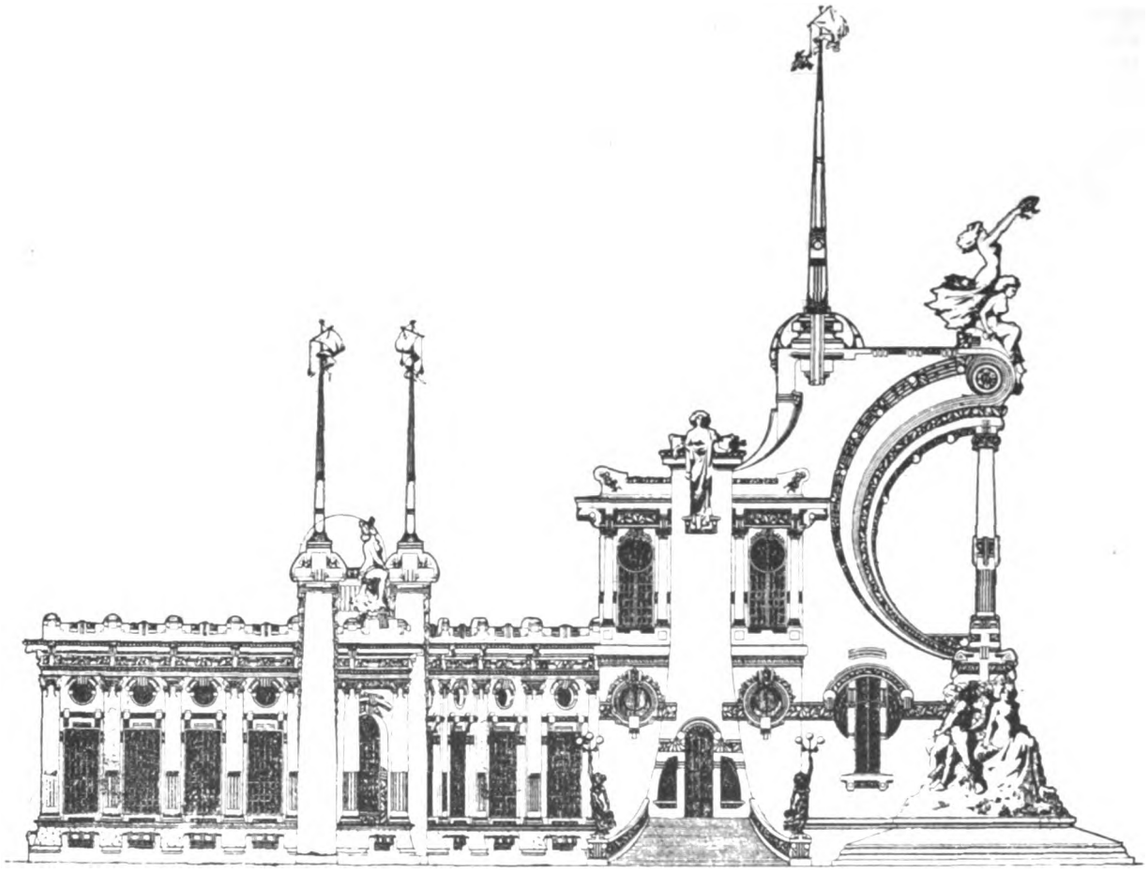
Wednesday was devoted entirely to the cathedral city of Gloucester, to which the party journeyed by train. After an hour or so "go-as-you-please," the members gathered together at the cathedral, and were met by Mr. F. W. WALLER, the surveyor to the Dean and Chapter, who showed them round and gave a very interesting account of the way in which the fifteenth-century men encased the Norman structure and of recent works and discoveries. Thus Mr. WALLER pointed out that it had been recently found that the vaulting to the south aisle of the nave rises 2 feet higher from the floor-level at the east end than at the west, notwithstanding that the floor itself rises 10 inches in the same direction. Mr. WALLER also explained the repairs that were in progress to the vaulting, much of which had become exceedingly dangerous, probably, in his opinion, as the effect of earthquake. Another subject on which Mr. WALLER enlightened the visitors was the daring construction of the central tower, in which a weight of 4,700 tons is carried upon so small an area of pier that the load upon it is between 12 and 13 tons per superficial foot, and this on a Norman work of freestone casing filled in with concrete. In their endeavour to reduce the superincumbent weight as far as possible, the builders of the tower had cut down the thickness of the upper part of the walls to as little as 8 inches in the panels. The general impression left on the minds of the members was that it would be impossible to persuade any district surveyor or other public authority to allow a modern architect to approach anywhere near the bold audacity of the fifteenth-century builders at Gloucester.

After luncheon the party separated into two main bodies, the one to sketch and photograph in the cathedral, the other to inspect, under the guidance of Mr. TREW, one of Mr. WALLER's assistants, many examples of old work scattered through the city.

Thursday found the excursionists again utilising the railway, and taking train to Bourton-on-the-Water, they then drove to Upper Slaughter, where the manor-house built in the reign of JAMES I. and the church were the items of interest noted on the programme. The church is originally of the Transitional period, the nave arcade having Pointed arches with chevron ornaments. The square and rather low western tower is Early English, with a belfry of Decorated date, at which time many additions and alterations seem to have been made, including a very fine and rich canopied tomb in the north chancel aisle. The chancel is remarkably long—in fact, longer than the nave, which points to a probable monastic connection. The manor-house is of modest size, but a well-preserved example of its date with a charming two-storeyed porch. Internally the staircase and some chimney-pieces of interesting but unpretentious character are the chief features. There is little doubt that the name "Slaughter," Upper and Lower, refers to the great defeat inflicted upon CANUTE by EDMUND IRONSIDES between these villages and Chastleton.

From Upper Slaughter the party drove to Nether Swell, in response to an invitation to visit the house that has recently been finished there from the designs of Mr. E. GUY DAWBER, a recent past-president of the Architectural Association. The excursionists were received by Mr. DAWBER and his client, Mr. SCOTT, and conducted through the grounds and the house. The latter as it now stands and as it is shown in Mr. DAWBER's Academy drawing, which we reproduce amongst our illustrations to-day, is an enlargement of the original house built only

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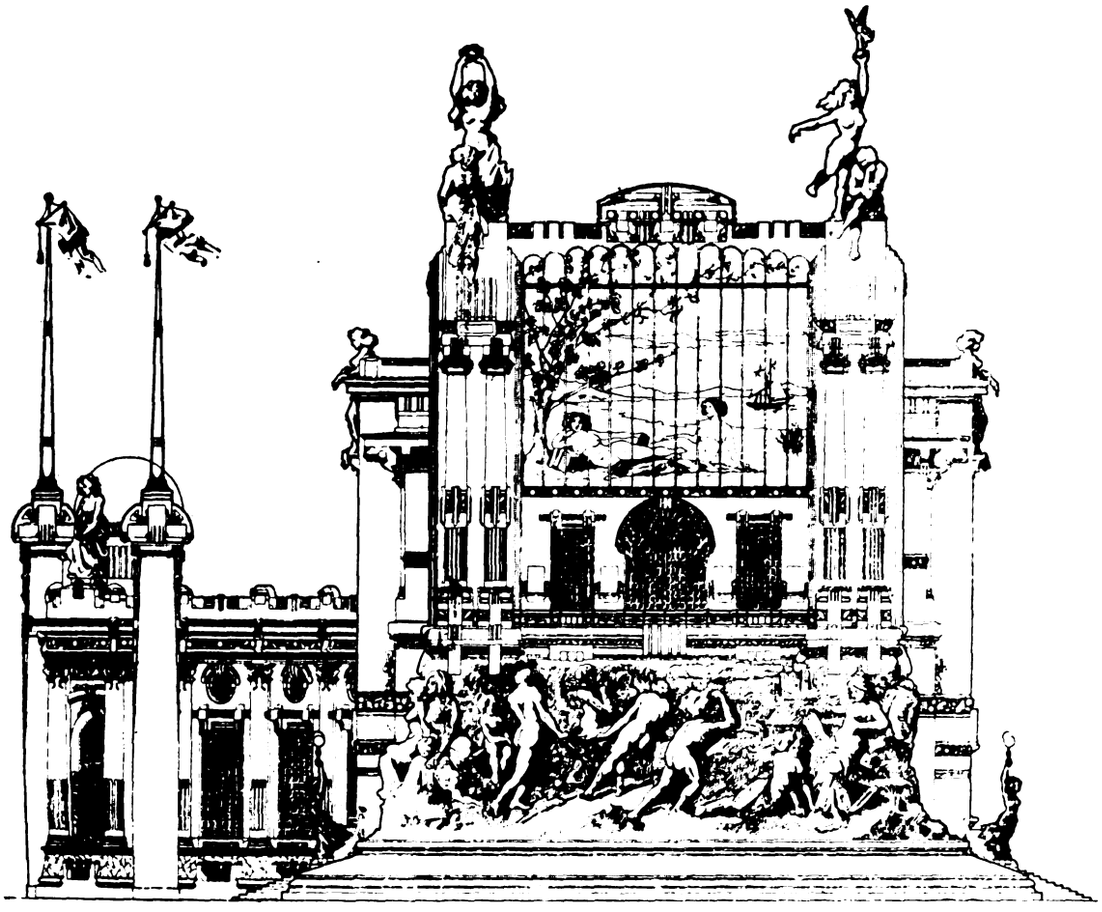
SIDE ELEVATION, PAVILIONS FLANKING ENTRANCE, INTERNATIONAL EXHIBITION, BUENOS AYRES.

a few years ago from Mr. Dawber's designs, and though at present rather new and staring, may be trusted in a short time to weather to the usual Cotswold silver-grey tone, which so pleasantly succeeds to the original bright yellow tint of the local stone. The gardens, too, which are extensive and well planned, want a few years' time before the bowling green will be fit for a match between any decent teams, and before the bronze vases from Paris and bronze sculpture harmonise with the stone walls. Bearing in mind that the whole environment has been created out of a bare hillside, it says much for the skill of Mr. Scott's designer that even in its newness—the work was only finished last June—there is a great deal of charm about both house and garden. When, however, the members were taken into the house, they received a cold douche to their artistic susceptibilities, the effects of which even an excellent luncheon failed entirely to efface. Outside the house we feel that we can understand what a large manor-house of the sixteenth century in the Cotswolds looked like when it was brand new. Inside we are in presence of a modern French attempt at a rechauffé of the work at Versailles, and a rather poor attempt at that, a "salmi," in fact, in which yellow and the present fashionable French grey of Paris are the principal flavouring of disjointed design in plaster. Mr. Dawber apparently had to stop outside whilst the interior of his design was being decorated, almost the only trace of his handiwork being the staircase. Even the doors opening towards the oak staircase are only oak on one side, and white Louis Quinze on the other. After the interiors, whether of old work or modern, seen at Broadway, the inside of Nether Swell set our teeth on edge. Perhaps we were unfortunate to be seated at luncheon opposite the fireplace of the dining-room, where an elaborate composition in grey plaster reaching to the ceiling surmounts a delicately sculptured white marble mantle enclosing a deep recess lined with the crudest and roughest of red brick, with wide mortar joints and fitted with a modern dog-grate. We could not help thinking what an opportunity has been missed for a real English interior on Jacobean lines, such as may be seen at Chastleton or Sudeley. What could have induced the owner of this fine house—externally—to go to Paris for his internal decoration, when such examples exist within the distance of a short drive, we cannot imagine.

Good as was the material refreshment at Nether Swell the artistic delight of Chastleton, at which the members completed their day's programme, was far better. Here is an interior that should be good to live with, as it was pleasant to study for all too short a time. A charming hall and stair leading on the first floor to a wonderful old dining-room, with splendidly carved panelling, full of a curious combination of refinement and coarseness in detail that conclusively proves that the craftsmen were to a large extent the designers of the work they executed, each expressing his own individuality. Chastleton is a house in which to study for a month, rather than to scamper through in an hour. From Chastleton the party drove to Moreton-in-the-Marsh station, and so by rail to Cheltenham.

Friday, the last full day, gave the excursionists their first relief from the blazing sun that seemed bent upon concentrating the whole of our belated summer into a single week, and clouds, with an occasional burst of sunshine, tempered the great heat. By rail again the party went to Winchcombe, and then drove up to the high-lying manor-house and chapel at Postlip. The house is clearly of at least two distinct periods, the eastern wing, with a gable on the south and a row of dormers on the east side being of Tudor date, and the extension westward with four more gables on the south or entrance front, of the early seventeenth century, probably of about the date carved on the fine dining-room chimney-piece—1614. This extension, which forms the greater part of the existing house, is said to have been the work of Giles, of Broadway. There is a good chimney-piece in the hall also, but the finest room of all is that over the dining-room, which not only has a magnificent chimney-piece, but is

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FRONT ELEVATION, PAVILIONS FLANKING ENTRANCE, INTERNATIONAL EXHIBITION, BUENOS AYRES.

panelled throughout with carved frieze and pilasters. A charming feature of the house is an internal courtyard in the centre of which is a fountain.

From Postlip the excursionists drove back to Winchcombe, where after luncheon a pleasant hour was spent in sketching some of the old houses and parts of the church.

Winchcombe is a market town of great antiquity, and in the past of great importance, for it was at one time a county of itself, until, in the days of CANUTE, his viceroy, EDRIC, "joined the Sheriffdom of Winchelscomb, which was entire within itself, to the county of Gloucester." During the Heptarchy it was the residence of some of the kings of Mercia, of whom OFFA founded a nunnery here in 787. In 798 CENULPH, who succeeded to the kingdom of Mercia after the death of EGFERT, OFFA'S son, laid the foundation of a Benedictine abbey for three hundred monks, and dedicated it to the Blessed Virgin MARY. This abbey gradually fell into the hands of secular priests until 985, when OSWALD, Bishop of Worcester, reformed its discipline, recovered the lands of which it had been deprived, and restored it to the Benedictines, who, despite some ups and downs, maintained a high position under a mitred abbot until the dissolution of monasteries. Now all trace appears to have been lost of its establishment except the traditional site.

Amongst the sources of wealth of Winchcombe in the past was the cultivation of tobacco, which is said to have been first planted here after its introduction in 1583. This industry was crippled by the restrictions on the trade introduced in the twelfth year of CHARLES I., which seems to mark the commencement of the decline of Winchcombe, judging from the remains of ancient architecture.

The parish church, partly erected by Abbot WILLIAM in the reign of HENRY VI., and completed at the expense of the parishioners with the assistance of RALPH BOTELER, Lord of Sudeley, is a fine example of Perpendicular work, especially notable for its bold detail and great gargoyles.

From Winchcombe a short drive through the park of Sudeley brought the party to Sudeley Castle, where they were met by the owner, Mr. DENT-BROCKLEHURST, who acted as cicerone to the marvellous collection of historical treasures with which the house is crammed, dating especially to the periods of the Tudors and the Stuarts, with whose fortunes the then owners were so closely connected. These do not, indeed, comprise all the relics of the past, for there is at Sudeley a quite remarkable collection of neolithic arrow-heads, celts, and other implements; and the contents of this remarkable private museum include many stirring records of English history from prehistoric times down to the mementoes of the late General GORDON.

Sudeley manor-house or castle was built by RALPH BOTELER, a famous admiral in the reigns of HENRY V. and HENRY VI., from the spoils gathered from the French navy. He sold it to EDWARD VI., to avoid confiscation, and that monarch granted it to Lord SEYMOUR, who afterwards married Queen CATHERINE PARR, the widow of HENRY VIII., for whose reception considerable additions were made. In ELIZABETH'S time, that queen was entertained at Sudeley in 1592 by the third Lord CHANDOS, and apparently about that time further additions were made. The castle being held by GEORGE, Lord CHANDOS, for the King in the Parliamentary war, was twice besieged, and although the artillery seem to have done little damage, a great portion was destroyed by the Parliamentarians after their capture. The ruins that they left give evidence that the design of the architectural work they destroyed was of a high character.

From Sudeley Castle the excursionists returned by rail from Winchcombe station to Cheltenham, and in the evening was held the usual meeting for display of sketch-books, for election of the excursion committee, and for music that constitutes the virtual wind-up of an A.A. excursion; but on Saturday morning a visit was paid by about half the members to the shops of Messrs. H. H. MARTYN & Co., LTD., where the bulk of the work in hand

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at present appeared to be in execution of designs by three of the regular attendants at the A.A. excursions—Mr. A. W. Prentice, Mr. G. H. Fellowes Prynne, and Mr. C. E. Bateman. The actual operations of high-class ornamental work in plastering, woodwork, carving, sculpture, and metal-work were seen by and explained to the visitors.

Thus ended a really enjoyable excursion, differing in one respect from all others but one of the preceding thirty-nine, as far as memory of the oldest attendant went—that of being rainless.

NOTES AND COMMENTS.

The competition for a new town hall at Stoke-upon-Trent looks like becoming a cause of heart-burning and wrangling on the same score as that for Middlesbrough public library—disregard of the conditions. As we report in another column, Mr. Leonard Stokes, the assessor, has selected the best three designs. Of these clearly the first and third considerably exceed the stipulated cost. Clause 15 of the conditions of competition reads:—"Any design adjudged to be likely materially to exceed the sum of 25,000*l.* on the buildings, exclusive of furniture, fittings, &c., will be disqualified, but in this sum 1,000*l.* must be included for an organ." This is quite clear and definite; there is no doubt about the meaning of "will be disqualified," and the assessor's obvious duty was to disqualify every design that infringed this condition, even if all were so disqualified. In the questions by competitors there was included the inquiry as to whether "the usual 10 per cent." margin on cost would be allowed, and the reply was "Am unable to add anything to the conditions already supplied to you with regard to the cost of the building." It was therefore made perfectly clear that the condition as to cost was "of the essence of the contract," as the lawyers say, and it is no answer to urge that the accommodation required could not be provided for the stipulated sum. The Council are therefore in our opinion quite right in adopting the recommendation of their committee to give the premium of 100*l.* to the design placed second by the assessor, and to insist on the disqualification of the others in accordance with the conditions.

It is high time that the Council of the Royal Institute of British Architects should decide whether assessors appointed by themselves or by the President are or are not to be expected to carry out their duties in accordance with the "Regulations for Architectural Competitions, approved by the Royal Institute of British Architects." We have had too many object lessons this year of an undesirable kind. Reading—the conditions drawn up by or with the co-operation of the assessor nominated by the President of the Royal Institute of British Architects. Naturally everyone thought they would be all right, and over 200 architects sent in their guineas for particulars. Then when designs were well under way, the competition is barred by the Royal Institute till the conditions are modified. Middlesbrough—the assessor again selected by the President of the Royal Institute of British Architects. Conditions of the competition, admittedly ridiculous, ignored by the assessor and successful competitors. Now Stoke-upon-Trent—cost a vital element, and the assessor ignores an absolutely precise and definite condition of the competition, and, as far as our information goes, awards prizes to designs that ought to have been disqualified. It may have been, as it ought to have been, that Mr. Stokes in his report said, virtually, "These are the best three designs, but under clause 15 of the conditions Nos. 1 and 3 are disqualified."

The death of Dean Lefroy removes from amongst us a remarkable personality, and one to whom both the Church of England and the lovers of our ancient architecture must ever look back with gratitude for the work he did at Norwich, the restoration of the interior of the cathedral and of the cloisters, the magnificent organ, and above all the extended use of and interest in their cathedral church that he induced in the people of Norwich.

An important point in compensation law was established by the decision in the Manchester County Court in the case of Harry Lees *v.* Waring & Gillow, Ltd. Plaintiff, a painter, had become incapacitated by lead poisoning caused by the character of his employment, and the point was that Messrs. Waring & Gillow, whilst admitting liability, claimed that their liability should be shared by Messrs. James Ferguson & Co., in whose employment the plaintiff had been during a part of the twelve months previous to his incapacity. It was held by the judge that both of the plaintiff's employers should pay the compensation allowance, and that their shares should be in proportion to the length of time during the twelve months before incapacity that the plaintiff had worked for each respectively.

COMPETITION DRAWINGS FOR MUNICIPAL BUILDINGS, BURSLEM.

The subject of this competition is the provision for Burslem of facilities for amusement and the administration of justice. For the former a concert-room to hold 2,000, exclusive of the stage, and an assembly-room for 400, exclusive of the platform, were to be included, provision being made for the service of banquets in the assembly-room and for dramatic performances in the concert-room. For legal purposes a police court, a borough court, and a children's court were to be provided, with the necessary retiring rooms, &c., for those engaged in the business of the courts. The cost was limited to 25,000*l.*, with a 10 per cent. margin. The site is an irregular trapezium, almost square, with a principal frontage of 197 feet to Wedgwood Place on the west, a frontage at the rear on the east to Price Street of 175 feet, a frontage of 140 feet to a cross street, Jenkins Street, on the north, whilst the remaining south side of 159 feet adjoins the Post Office. The frontage to Wedgwood Place falls 11 feet 3 inches from north to south, and that to Price Street 8 feet 6 inches in the same direction, the cross street being practically level. The site, as the competitive designs show, is none too large for the accommodation to be provided, and the limit of cost does not allow of extravagance.

Twenty-three designs were submitted, and the assessor, Mr. Henry T. Hare, placed first that of Messrs. Russell & Cooper, whose prize is the job, whilst Mr. E. M. Thomas obtains the second place with a premium of 100*l.*, and Messrs. Warwick & Hall, the third with a 50*l.* premium. Messrs. Russell & Cooper have placed their building squarely on the site, and arranged a symmetrical front to each thoroughfare. By so doing they leave an open space between their building and the Post Office, enabling them to obtain from this space three separate entrances for the courts—one in centre for the public, one for children, and one for the police. Then, on the main frontage, that to Wedgwood Place, they are able to get the entrances to the concert hall, which occupies the central portion of their building on the principal axial line. Taking advantage of the fall of the ground, they have been able to arrange two entrances to the gallery of the concert hall, and a magistrates' entrance under one of the gallery stairs. The artistes' entrances are in Prince Street, and also that to the scene store and dock, whilst the entrance to the smaller assembly hall is in the centre of the Jenkins Street frontage.

The large concert hall, being in the middle of the site, has symmetrically, on the south of it, the two courts back to back, and on the north the assembly hall. The concert hall has an internal corridor on each side, 7 feet wide, separated by piers only from the auditorium, and having over it part of the gallery, thus lessening the apparent projection of this. The hall seats 1,100 on the floor level, 583 in the main gallery, 180 in the back gallery and 120 in spring-up seats on the gallery walls—a total of 1,983.

The internal corridors of the hall lead to a crush hall, 94 feet by 9 feet, from which access is obtained to the cloak-rooms for gentlemen and ladies, each 27 feet by 20 feet. Two green-rooms are provided, one for the concert hall only, the other for either the concert hall or

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the assembly hall. The kitchen and scullery to serve banquets in the assembly hall are on the lower ground floor below one of the cloak-rooms. The whole arrangement results in a simple and workable plan. The elevations are treated with great severity, as befits any building in a smoky manufacturing town like Burslem, but an admirable architectural effect is gained by a recessed portico of five bays with big Ionic columns and solid pavilions of slight projection at each end. Both practically and æsthetically the treatment of this portico is excellent.

Mr. E. M. Thomas, the author of the second premiated design, has adopted a similar principle in his plan to that of Messrs. Russell & Cooper—concert hall in the centre, assembly hall to the north and courts to the south. He has, however, left more space for entrance to the courts between his building and the Post Office, and so has been more cramped for room. There is consequently not the same directness and simplicity of plan that characterise the design placed first. Particularly in the disposition of the court department there is too much corridor and consequent maze-like plan. In Mr. Thomas's arrangement the entrance to the assembly hall is in Price Street, busier and therefore less quiet than Jenkins Street, which is a short cross thoroughfare. In this design there is also the treatment of recessed colonnaded portico that we find in the winning one. It is, however, less important, and being brought forward in front of the main wall cuts off the lower part of the windows above, which with their pediments and columns are an integral portion of the elevation. The treatment of the detail is of a more elaborate and ornate character than is Messrs. Russell & Cooper's, and hence not so suited to Burslem.

Messrs. Warwick & Hall's plan is quite distinct in motif from either of their more successful competitors. They have placed the concert hall on the north side of the site with its crush hall and entrances towards the cross thoroughfare Jenkins Street. The courts are then located on the south-west, and the assembly hall on the south-east portion of the site, which is fully occupied up to its limits. The entrance to the courts thus comes on the Wedgwood Place frontage, and that to the assembly hall on the Price Street front. There may be some logical reason for such a disposition, each of the three main divisions of the building being entered from a separate street and each distinctly differentiated and expressed in the architectural treatment of elevation and grouping. In the result, however, it must be said that Messrs. Warwick & Hall's scheme gives less accommodation in accessories, retiring-rooms, &c., than does that of Messrs. Russell & Cooper. We like the expressiveness and the treatment of the exterior, but this necessarily detracts from the dignity found in the winning design. As a matter of composition only we think Messrs. Warwick & Hall have erred in placing their lower buildings on the lower part of the site and their main and highest block at the upper level.

Messrs. Spier & Bevan have adopted in the main the disposition followed in the third premiated design, but have placed their entrance and crush hall to the concert hall on the Wedgwood Place frontage. Their plan has many good points, but their courts are small, the entrance to the assembly hall is not satisfactory and the accessories are meagre. Their elevations are worthy of a better plan and are of the modern municipal Renaissance character.

Messrs. Bailey & McConnal have designed an imposing but too costly building, and have crippled the planning of their concert hall by devoting too much space to their courts—a mistake made by several other competitors.

Messrs. Milne & Hepburn have started with an idea similar to that of the winners, but have reversed the position of the assembly hall and courts. The latter are small, and the details of the plan do not fit together well or give the accommodation that might have been obtained. The elevations are not good and sadly lack a sense of proportion.

Messrs. May & Perrin have their concert hall paraliel to and adjoining Price Street; their courts occupy the whole of the Wedgwood Place frontage and the assembly hall is in the middle of the site. The children's court was required to be small, but 20 feet by 18 feet is a bit too small. The elevations are simple and dignified.

Messrs. A. R. Wood & Son have designed a good exterior, not too ornate; but their plan has the courts and halls rather too much mixed up. Their concert hall is also rather too much of a theatre, as if they expected the "variety" or music-hall form of concert, which, we understand, falls in with the views of the Town Council.

Mr. J. B. Fulton is one of those who has placed his concert hall on the east side of the site, but he has kept his building rectangular and symmetrical. The assembly-room is at the S.W. angle on a lower level than the concert hall. The plan is a good one in the main, but a disproportionate part of the site is occupied by the courts, which have more than their share of corridors and entrance halls. Mr. Fulton's perspective is of the interior of the entrance hall to law courts, a good drawing and a well-designed feature of the plan.

Messrs. Wills & Anderson have, so to speak, adopted Mr. Fulton's idea reversed—the concert hall to Wedgwood Place, the courts to Price Street, and the assembly-hall in the S.E. instead of S.W. corner, and, like Mr. Fulton, they have devoted too much area to the courts. Their elevations are eminently simple and dignified.

Mr. A. Hessell Tiltman has the same general disposition as Mr. Fulton with the same ultra-importance in plan of the courts. He proposes a lofty tower as part of his design, and places it in the short cross street.

There can be no question as to the superiority of the plan of the winning design, and it is adaptable for the uses intended by the Town Council, although it is not so obviously in accord with the methods by which those functions were expected to be possible.

INTERNATIONAL EXHIBITION AT BUENOS AYRES.

To commemorate the first centenary of Argentine Independence the National Government is organising an International Exhibition of Railway and Land Transport, which will be open at Buenos Ayres from May to November next year. The exhibition will occupy an area of 180,000 square metres, one-half of this area being intended for structures and the other half for streets, gardens and other ornamental accessories. As an example of the architectural treatment adopted we illustrate the designs for some of the more important buildings.

ARCHITECTURAL REFINEMENTS IN MEDIÆVAL CHURCHES COMPUTED.

Professor William H. Goodyear has called our attention to an article in this month's *Architectural Record* by Professor Hastings, which is collateral evidence corroborative of Professor Goodyear's view that in Mediæval buildings there are variations from the obvious hard-and-fast setting out that might be expected, and that, whatever their reason, æsthetic or otherwise, these variations are intentional and not accidental. Professor Goodyear says concerning the article—which we reprint—by Professor Charles S. Hastings, professor of physics in the Sheffield Scientific School at Yale University:—"Professor Hastings is one of the most distinguished members of the Yale faculty. He is the author of a book on physics and also of a book on optics, and is also the inventor of a magnifying lens which is named after him the Hastings lens, and which is manufactured and sold by Bausch & Lomb, the most important manufacturers of lenses in this country. It will hardly be necessary for me to mention the attainments and capacity of Professor Hastings in optics and in mathematics after the article is read, and in his capacity of professor of physics in a technical school of practical engineering he is also an expert on thrusts and strains. It will be found that Professor Hastings's article is mainly concerned with the Church of St. Ouen at Rouen. Although I do not wish to obtrude my own personality into the consideration of Professor Hastings's article, it is still a

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matter of interest that after I examined this church in 1903 I described it in two publications as having strictly perpendicular piers. In 1907 I was led to re-examine this church, and was astonished to find that the piers diverged in straight lines, beginning at the pavement, 6½ to 7 inches to a side. This measurement was estimated on a surveyor's disc of rather small dimensions in the photograph, and could not be considered as a closely accurate measurement. It will be found, however, that this estimate corresponds within a third of an inch to the estimate made by much more accurate methods which is published by Professor Hastings. It is not at all important to dwell on the correspondences of measurements as between my own measures and those of Professor Hastings at Rheims, especially as the surveyor's disc in the nave at Rheims was of unusually small size in the photograph, and it is difficult to make an accurate compass estimate on such a disc. However, I will mention as a matter of possible interest that my estimated measurement for the divergence of the north side pier at Rheims, which is numbered four in Professor Hastings's table, was 10 inches; 2 inches of this estimate are accounted for by an off-set or stepping back of the vaulting shaft just above the capital, so that my estimated inclination was 8 inches. Professor Hastings's estimated inclination on the same pier was 0.677, which is $8\frac{1}{8}$ inches. In other words, our estimates at Rheims corresponded to the sixteenth of an inch. As I have said, I do not wish to lay any stress at present on these correspondences, as Professor Hastings's measurements are scientific and mine are empirical. What I wish to point out is that the widening refinement in the Church of St. Ouen has been demonstrated to exist by a professor of physics who has astonishing mastery of engineering, of optics and of mathematics. This demonstration is based upon methods and the use of instruments which are hardly understood except by astronomers and by scholars in physics":—

It has long been known that many of the great Mediæval Gothic monuments of northern Europe do not follow simple geometrical forms, either in their plans or in their elements of construction. Such features have been largely ignored by writers on Gothic architecture, or, if noted at all, have been treated as evidences of either originally defective construction or as proofs that the edifices have, since their erection, suffered deformations by yielding of their supports or foundations. Professor William H. Goodyear has been convinced, from his studies, that many of these deviations from geometrical simplicity have not only existed from the beginning, but were consciously introduced by the architects as essential parts of their designs. He has attempted to establish his theories by an assiduous collection of requisite data from such of these monuments as his time and the laborious nature of the necessary measurements permitted; he has displayed the results of these investigations in lectures and in printed papers of extraordinary interest. And, indeed, if his views are correct, their importance can hardly be overestimated; for they mean that this kind of rational, purposeful deviation from geometrical simplicity is an essential feature of Gothic architecture; remove it entirely, and whatever may remain it is *not* that architecture which is the glory of the twelfth, thirteenth, and fourteenth centuries in Europe.

The task which meets the investigator in this field is to prove that the admitted departures from geometrical simplicity are in no sense irregularities, since they lack the element of fortuity; to demonstrate that the haphazard character, which alone reduces them to the realm of accident, is wanting. Mr. Goodyear's method has been to select a large number of examples illustrative of the characters in question, to show their departures from simple regularity by photographs which contain proper reference lines, such as plumb lines or the like, so arranged that not only is the fact strikingly evident, but every examiner of his photographs can find the quantity which is the true measure of the deviation, and then, by a study of the nature of the masonry, demonstrate that supposed yielding subsequent to the erection is absolutely untenable as an explanation. In addition, the strongest support for his views is found in the extraordinary adjustments shown in the minor features of the structures which are indisputably contemporaneous with the building of the more organic members, such as the wall openings and the inclinations of jambs and of mullions, of which he has collected an astonishingly rich store. He has thus founded an irrefragable argument in support of the belief that these features, so strangely neglected by writers on the history of architecture, are the objects of intelligent design and should be classed as architectural refinements. Nor is it possible for any physicist or engineer who has examined the evidence in Mr. Goodyear's possession to entertain for a moment a theory which accounts for the peculiarities by movements in the building subsequent to its erection; there is not only no stone which could suffer the strains implied and maintain its integrity, but there is no material known of such physical properties that it could under any kind of stress produced by weight suffer the kind of deformations that this theory postulates.

There is, however, an entirely independent method of arriving at the truth in a question of this kind. Suppose that we should make a careful study of any architectural monument of the Middle Ages and measure all the deviations from geometrical simplicity; from such a collection of measurements we could, by methods familiar to physicists and to astronomers, find a definite value to serve as a measure of the accidental errors of our measurements and also a definite measure of the fortuitous element of the structure itself. Again, suppose that after allowing for the effects of these elements of chance that there remained a residue which was obviously systematic, that is, which could be described in simple and unambiguous language. Under such circumstances one would say that the deviations were subject to law, and all the rules of logic would compel us to the conclusion that the deviations were the result of intelligent design. Our attitude might be exemplified by that of a traveller in a desert, uninhabited region, whose attention was attracted to numerous irregularities on the surface of the hillsides which, following all the larger unevenesses of the ground, still exhibited carefully adjusted slopes, never reversed in direction. Such a traveller would inevitably conclude, however faint and ruinous these remains now are, that he had here the evidence of the former existence of inhabitants who were familiar with the art of artificial irrigation. So in this field a discoverer of a definite *system* of variations from normal simplicity can infer the previous existence of design without troubling himself at all either as to the motives which stimulated the design nor as to whether the end sought by the designer was attained or not. It is by such methods and by such reasoning that I hope to add to the material and to the conclusions which are so closely identified with Professor Goodyear.

Until recently my own knowledge of the architectural refinements in Gothic mediæval churches was confined to the expedients of building the great divisions of the church on unconformable axes and the curving of the vaulting shafts; thus, when I failed to find the latter peculiarity in St. Ouen, it seemed to me that the upward widening of the nave, which is so easily detected in Notre Dame, was there absent. This error was corrected only when Mr. Goodyear gave a lecture at this university early in the current term; then for the first time did I learn of his discovery of widening with rectilinear vaulting shafts. Shortly after I found a number of negatives which my daughter had made in 1901 and which seemed adapted for study. These were (a) a negative taken from the back of the choir in St. Ouen at the level of the triforium gallery, and approximately eight feet from the line of the north wall; (b) a second one, taken from the same gallery, about seven feet north of the line of the other wall; (c) and (d) from the north and south ends, respectively, of the transepts at the same level; and, finally, (e) a negative, taken from the gallery at the level of the bottoms of the clerestory windows at the west end of the cathedral at Rheims. It is the results from the studies of these negatives which is the subject of these notes.

Before describing the methods of measurement, it is well to consider the quite obvious objection which may be urged that the photographs are not sufficiently reliable representations of the subjects for the delicate uses to which we are to put them. It is true that all photographic reproductions are subject to errors, but an analysis of the objection shows that we have only two classes of errors to fear. The first is the perspective convergence of parallel lines, and the second is the more or less inevitable distortion of the optical images. The first error entirely disappears if the plate is perfectly parallel to the system of lines whose mutual inclinations are sought from the plate; that is to say, in the case of vertical spreads, if the plate was accurately vertical. But even if there were an error of adjustment of this sort it would introduce divergencies of such a simple type that they could readily be eliminated from the measurements. An example of the way in which this may be done will appear in the discussion of the variation of the nave width. In this series of negatives no perspective divergence of the vertical members of the structure could be detected, and we must suppose that the plate was essentially vertical. The camera was provided with a level.

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The error of distortion appears as a continuous change in the linear scale of the image with the distance from the centre of the plate. Practically it is always an increase, so that the effect is to exhibit the image of a rectangular network with all its lines, except those which pass through the centre, as curved lines, convex inward. In so-called rectilinear camera lenses this error is very small, so that the curvatures introduced optically are wholly inappreciable to the eye; but in an investigation as delicate as that which here occupies us, it would not do at all to rely upon the condition of rectilinearity being perfectly attained by any optician, however skilful. Fortunately, the geometrical character of the errors is of such a nature that we can readily escape being misled by them through a properly devised method of measurement. It is obvious, from the description of the kind of distortion to which photographs are subject, first, that all straight lines passing through the centre of the picture remain straight in the photograph; and, second, that all lines nearly at right angles to a straight line through the centre preserve unaltered their inclinations to each other in the region near the diametral line. Hence, for example, if we are attempting to measure small deviations from the vertical of a system of lines, we cannot be misled by errors of distortion in the picture if the observations are confined to portions of the system near a horizontal line passing through the centre of the plate. In the following measures the indicated precautions were carefully observed.

In order to determine angles the negatives were successively placed on the circle of a dividing machine, which was mounted upon ways. Above the negative was stretched a fine wire. By a proper turning of the circle and shifting on the ways any line of the negative could be brought under the wire and a coincidence secured with great accuracy. Thus examined, the first negative (a), which was taken from a point in the triforium gallery, about seven feet north of the axis of the church, showed a mean divergence of the piers on the opposite sides of the nave of 45.8 minutes of arc, with an indicated uncertainty of 0.7 of a minute.* Similar measurements of the second negative (b), taken at about eight feet south of the axis, gave 46.7 minutes, with an indicated uncertainty of 1.3 minutes; from the two values I deduce a spread of 46.1 minutes, as the best attainable, with an indicated uncertainty of 0.8 of a minute.

The final value may be expressed in more familiar terms if we reduce it to linear feet. Adopting the height of the line of springing of the vault arches above the pavement as equal to 78.7 feet (Viollet-le-Duc), this corresponds to a spread of 1.055 feet in the nave.

Similar measurements on the negatives of the transepts gave 16.9 minutes and 16.1 minutes respectively. A reduction of the mean of these two values gives 0.378 feet for the spread of the transept. The disparity of these two spreads seemed somewhat surprising, but it occurred to me that it might have some relation to the relative lengths of the two colonnades. The only plan of the church accessible to me is that contained in Fergusson's familiar work; this gives the ratio of the length of the church to its width as 2.71, while the ratio of the two divergencies which I found is 2.79. This agreement of ratios is most striking, and renders it difficult to escape the conviction that the architect fixed upon it for reasons of his own. If we admit design it presents us with one of the most delicate refinements yet noted.

In the measures of angles there was no certain indication of fortuitous differences; but there is strong evidence that such accidental errors, if as great as one-fiftieth of the total divergence in the nave, would have hardly escaped detection.

After the inclinations were measured, the negative (a) was placed on a comparator and the absolute separation of the images of the inner faces of the piers was determined. It was also found that the ratio of the width of the nave at each pier to the height from the pavement to the springing line of the vault was constant. This was found to be 0.386, with an uncertainty of one-five hundredth of the whole value. In order to interpret the measures it is necessary to have some dimensions given in known terms. Fortunately, I have three such standards at command: first, the plan drawn to the scale of 100 feet to the inch in the well-known work of Fergusson; second, the elevation of a bay of this church, with attached scale, in the dictionary of Viollet-le-Duc; and, third, the known focal length of the camera with which the negatives were made, namely, 15.0 centimetres. Anyone of these data would yield values for the real dimensions of the measured features of the nave, and such derivations from each should agree with those from the others within the limits of errors which we are forced to ascribe to the data themselves. It may be stated at once that, since a careful study failed to detect any significant errors in any one of these quantities, as compared to the others, we may have a corresponding enhanced confidence in the results.

These data, with my measurements and some obvious deductions, are contained in the accompanying table. I arbitrarily assume that the pier height, given above from Viollet-le-Duc, is that of the fifth pier from the crossing; hence, from my determination of the ratio of width to height, the width of the nave at this point is 30.41 feet.

Table 1.*

Pier.	D.	N.	S.	w.	W.	W'.
1	162·0	—	−2·054	—	—	30·87
2	182·7	+0·716	−1·808	2·524	30·76	30·76
3	203·4	+0·653	−1·601	2·254	30·58	30·64
4	224·1	+0·601	−1·440	2·041	30·51	30·52
5	244·8	+0·556	−1·306	1·862	30·41	30·41
6	265·5	+0·506	−1·200	1·706	30·21	30·30
7	286·2	+0·460	−1·122	1·582	30·21	30·18
8	306·9	+0·419	−1·052	1·471	30·11	30·06
9	327·6	+0·380	−0·990	1·370	29·94	29·95

Here D is the distance in feet from the position of the camera to the planes of the several piers as derived from Fergusson; N and S are, respectively, the micrometrically measured distances from the vanishing point of east and west parallel lines in negative (a) to the several piers on the north and south sides of the nave, expressed in centimeters; and W are the corresponding apparent widths in the same unit of length. Pier 1, on the north side, is hidden by the crossing pier, and hence does not appear in the last-named column.

A casual inspection shows that the products of D by W are not constant throughout the table, as they should be if the apparent convergence in the picture were due to perspective alone; but instead of being constant they continuously diminish with increasing D. To test this, I have multiplied each of the products by a number which will yield our arbitrarily assumed width of 30.41 feet at pier 5, and entered the results in the column headed W. Clearly, there is a narrowing towards the west. If we assume a total narrowing of 0.92 of a foot from pier 1 to pier 9, equally distributed through the eight bays, we have the numbers given in column W'; the differences between W and W' afford a measure of the precision of the construction. These differences indicate an uncertainty in the width of only 0.03 a foot, which obviously includes the real errors of the structure and my own errors of measurement. Of course, in view of the established constancy of the ratio of height to width, this means that the vault also is lowered towards the west.

This wholly unlooked-for discovery prompts the question as to whether the conclusion can be avoided by any modification of one or more of the fundamental constants upon which it rests. A serious investigation from this standpoint has been unfruitful, hence I am obliged to assert my belief in the reality of the feature.

An inspection of either of the photographs (a) or (b) shows that the axis of the nave is not a straight line; it seems to be a delicate curve of long radius convex northward. The above table enables us easily to test this impression. After finding from the negative (b) that the first pier on the north side is 0.120 of a foot south of the line joining the second and ninth piers, I find, by a calculation the nature of which is almost obvious and need not detain us here, the offsets of the individual piers on each side as given in the accompanying table:—

Table 2.

Pier.	N.	S.	Mean.	Calc.
1	0·000	0·000	0·000	0·000
2	0·120	0·110	0·115	0·152
3	0·296	0·350	0·323	0·304
4	0·455	0·482	0·468	0·452
5	0·598	0·614	0·606	0·604
6	0·528	0·590	0·559	0·583
7	0·390	0·372	0·381	0·389
8	0·229	0·173	0·201	0·194
9	0·000	0·000	0·000	0·000

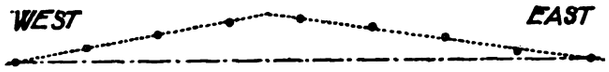
Here N and S are the offsets for each pier in fractions of a foot from the line joining the first and ninth on each side, in every case to the north. The next column is the mean of the two which may be taken as a determination of the deviation of the axis of the nave from a straight line joining the

* This is the numerical value of the probable error deduced from the group of measures. This explanation will render my meaning perfectly clear to those familiar with the theory of errors.

* This table has been given in full because anyone by means of it can test independently my conclusions either by calculation or by construction on the drawing-board.

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point midway between the first piers, north and south, and the corresponding point between the ninth pier. The accompanying figure (Fig. 1) exhibits the deviations greatly magnified, the scale being twenty times as large in the north-



south direction as in the east-west direction. The dots in the small circles represent the quantities in the fourth column of the table. It is at once evident that the points do not lie on a curve, but very nearly on two straight lines, represented as dotted lines in the figure, which intersect in the middle of the sixth bay. The agreement with this supposition is strikingly accurate; indeed, if 0.680 foot be adopted as the offset of this point of intersection, and the values and the offsets at the various piers be calculated, we derive the figures of the last column, which may be directly compared with my measurements in the other columns.

The positions of the mid-points of the piers at the crossing are certainly very nearly on the same line as those of bays 1 to 5.

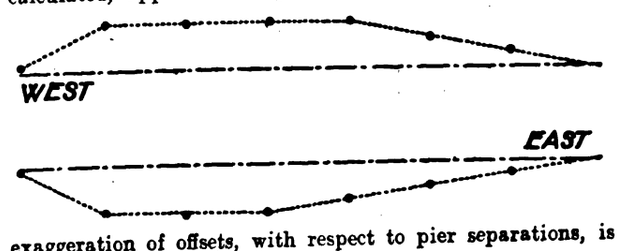
The material for a study of the construction of the cathedral at Rheims, consisting, as it does, of a single negative, is far less comprehensive than that of St. Ouen. Moreover, the position of the camera was not so favourable for our purposes. Its height was so great that the piers below the capitals of the great arcades cannot be studied, although we know from Professor Goodyear's observations that these piers are vertical. In the negative all the great piers at the crossing are well shown; on the south side eight of the vaulting shafts are well adapted for measurement, and on the north side seven. The measurements show readily that all of the crossing piers are parallel, and also, since there is a conveniently placed chandelier rope in the picture, that they are strictly vertical. The declinations from the vertical which follow were either determined from a crossing pier or from this rope hanging from the vault, whichever seemed the more convenient at the moment. As in St. Ouen, the vaulting shafts are rectilinear, but, unlike that example, they are not all parallel on either side. The shafts nearest the crossing are but slightly inclined outward, while the fourth, fifth, and sixth on each side have nearly similar inclinations; the seventh on each side again approaches closely the vertical. Viollet-le-Duc gives, for the distance from the capitals of the nave to those at the top of the vaulting shafts, about 52.5 feet; this constant yields with my measurements the leans for the shafts given in Table III. in the horizontal rows marked "Obs."

Table 3.

Pier—		1	2	3	4	5	6	7
North	Obs.	0·235	0·434	0·631	0·677	0·675	0·648	0·095
	Cal.	0·221	0·442	0·664	0·664	0·664	0·664	—
South	Obs.	0·163	0·342	0·490	0·653	0·683	0·648	0·053
	Cal.	0·141	0·282	0·423	0·664	0·664	0·664	—

It is evident that the leans on both north and south side for the piers 4 to 6, inclusive, are practically the same. If we assume that the mean of these measured values, namely, 0.664 feet, be that prescribed for this portion of the nave, we are forced to admit that the wonderful masons who built this cathedral could be relied upon to erect shafts with an uncertainty of inclination of less than 0.011 feet in a length of 50 feet. Such precision, if admitted, demonstrates a most curious fact: the builders of the north side of the nave made the change from the vertical position at the crossing piers to the normal lean of the nave in three steps, while those of the south side made the change in four steps. At least, this is the only interpretation of the measures which reduces the errors to the established limit as appears from the values in the lower lines, which are calculated on this theory.

A graphical representation of these offsets, observed and calculated, appears in Fig. 2, where the same twentyfold



exaggeration of offsets, with respect to pier separations, is followed as in the previous figure.

This is the only departure from geometrical simplicity in construction which I have found giving rise to a suspicion of a real error or mistake; at least, so capricious a variation from a definable system seems hard to understand otherwise. In any case, it is curious that such a singularity seems to have escaped observation hitherto for seven hundred years.

The conclusions in this paper, derived from a series of measurements of photographs, may be admitted to have great interest; but it seems to me that the true value of the investigation lies in two of its features. In the first place, it exhibits a method by means of which architectural monuments can be surveyed with an expenditure of effort incomparably less than that required for a thorough survey by direct measurements. The other feature, of perhaps still greater importance, is that, as far as known to me, it constitutes the first effort that has been made to determine the lower limit of precision which we ought to attribute to the mediæval masons. In any discussion as to the origin of the deviations from geometrical simplicity in these structures, this datum is clearly of the highest importance

ILLUSTRATIONS.

REBUILDING OF NETHER SWELL MANOR, GLOUCESTERSHIRE.

THIS building was one of those visited last week in the course of the annual excursion of the Architectural Association, and reference to it will be found on p. 113 in the leading article descriptive of the excursion to Cheltenham and district. Mr. E. Guy Dawber is the architect.

BOYS' SECONDARY SCHOOL FOR THE BOROUGH OF BROMLEY KENT.—DETAILS OF PRINCIPAL ENTRANCE.

THIS school, when completed, will accommodate 300 boys, but at present only a part of it, sufficient for 200, will be erected. The main frontage is placed 50 feet back from the line of Hayes Lane, and contains the principal entrance. There are two other entrances approached from Hayes Lane also—viz. that for the senior boys at the western side, and that for the juniors on the east. The style of the building is eighteenth-century, and is in character with the interesting buildings of old Bromley. With such an ample and open site a building of more than two storeys was judged to be uncalled for. The accommodation provided is indicated clearly on the plans and meets all the conditions imposed in the competition. The building consists of a central block, containing the central hall, class and lecture rooms, and the whole of the teaching portion of the school, while the eastern and western wings contain the dining-hall, gymnasium and auxiliary accommodation. The caretaker's house adjoins the east wing. The elevations are of brick with a careful use of Portland stone. The most ornate feature is the main-entrance doorway with walling above, the details of which are shown on our second plate. The plans were obtained by limited competition, as the result of which Mr. John Bilson, F.S.A., F.R.I.B.A., the assessor, selected that by Mr. H. P. Burke Downing, F.R.I.B.A., which is here illustrated.

THE "FILESMITHS' ARMS," SHEFFIELD.

THIS house was erected in 1906 for the owners, Messrs. Wm. Stones, Ltd., of Sheffield, and replaced an old and somewhat inconveniently arranged structure. The materials employed are dark salt-glazed bricks in the base with vitreous buff terra-cotta above; the panels over the ground-floor windows are of green faïence, and the letters are gilt. These materials and the general treatment of the building were adopted so as to permit frequent washing of the exterior. The terra-cotta was supplied and fixed by the Burmantofts Works of the Leeds Fireclay Company, Ltd. Messrs. H. Freckingham & Sons, Ltd., of Sheffield, were the general contractors, and Mr. James R. Wigfull, A.R.I.B.A., of Sheffield, was the architect.

SHOPS AND OFFICES, WAKEFIELD.

THESE premises have been recently erected in Market Place and Cross Square, Wakefield, on a triangular site. A separate entrance is provided from Market Place to the upper floors, which are to be let off as offices. The materials are grey terra-cotta, the roof being covered with green slates. The architect is Mr. Percy Robinson, F.R.I.B.A., Leeds.

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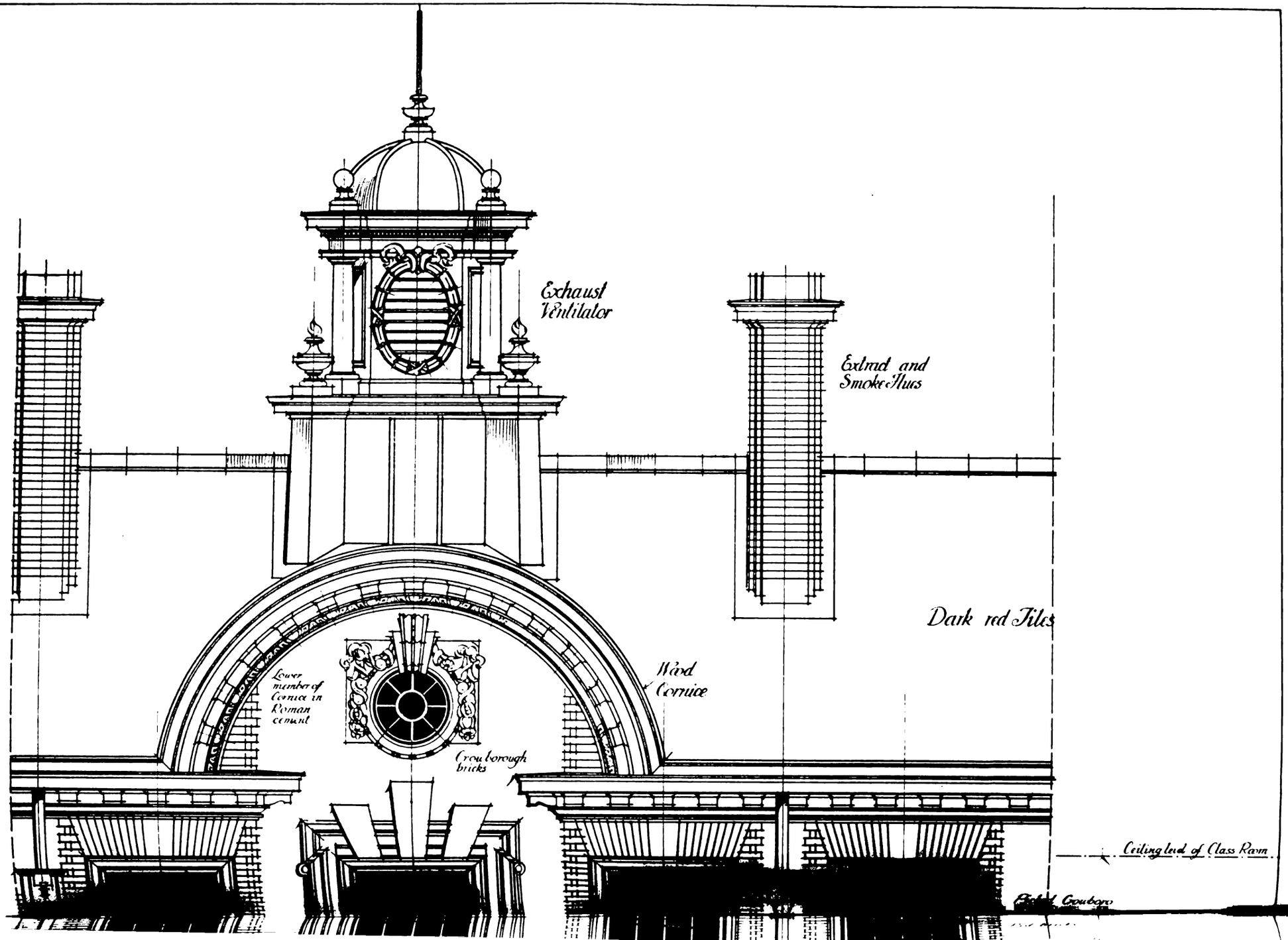
THE "FILESMITHS' ARMS," SHEFFIELD.

JAS. R. WIGFULL, A.R.I.B.A., Architect.

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BOYS' SECONDARY SCHOOL, BROMLEY, KENT: DETAILS OF PRINCIPAL ENTRANCE.

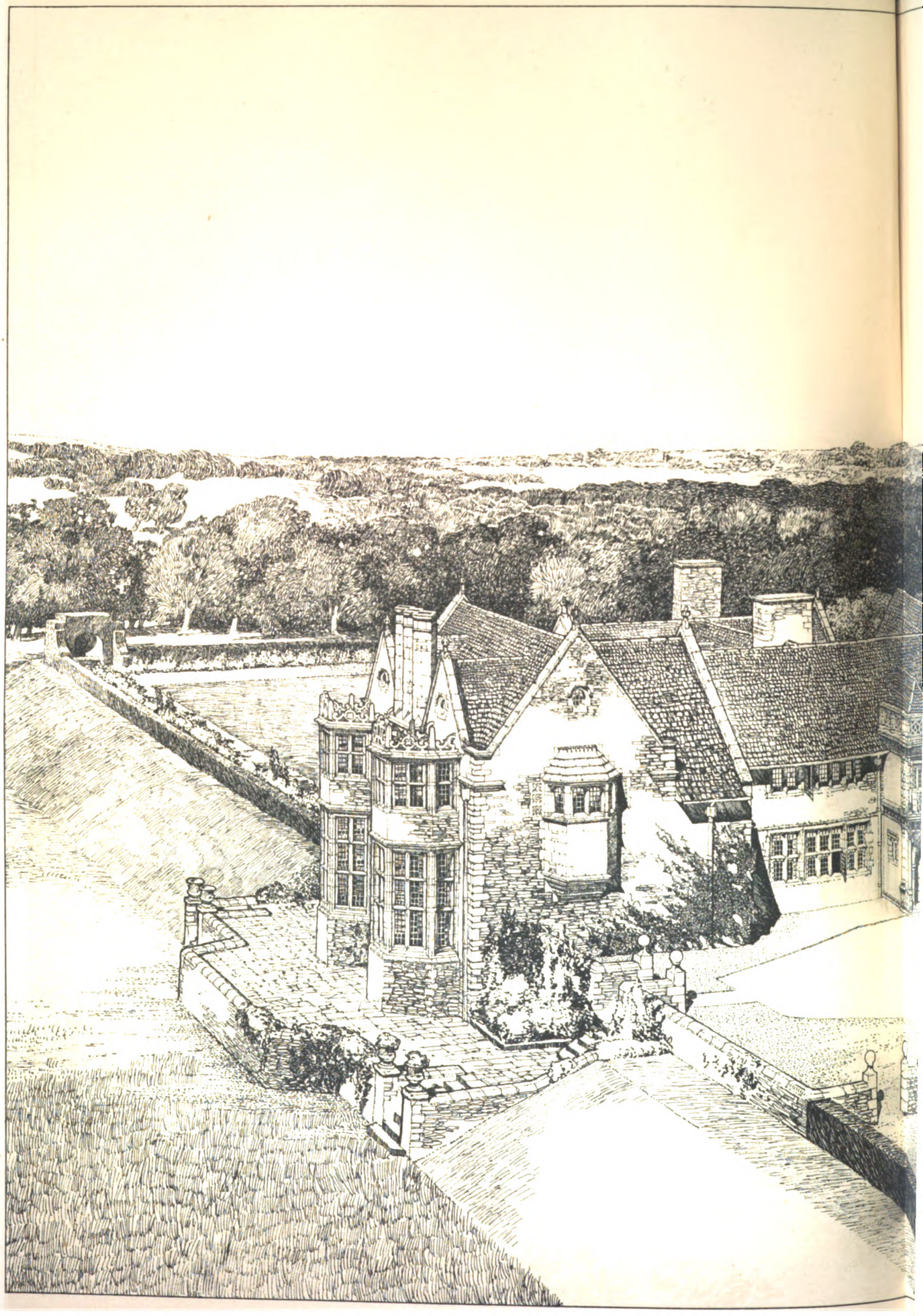
H. P. BURKE DOWNING, F.R.I.B.A., Architect.

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This is 20th 1909.

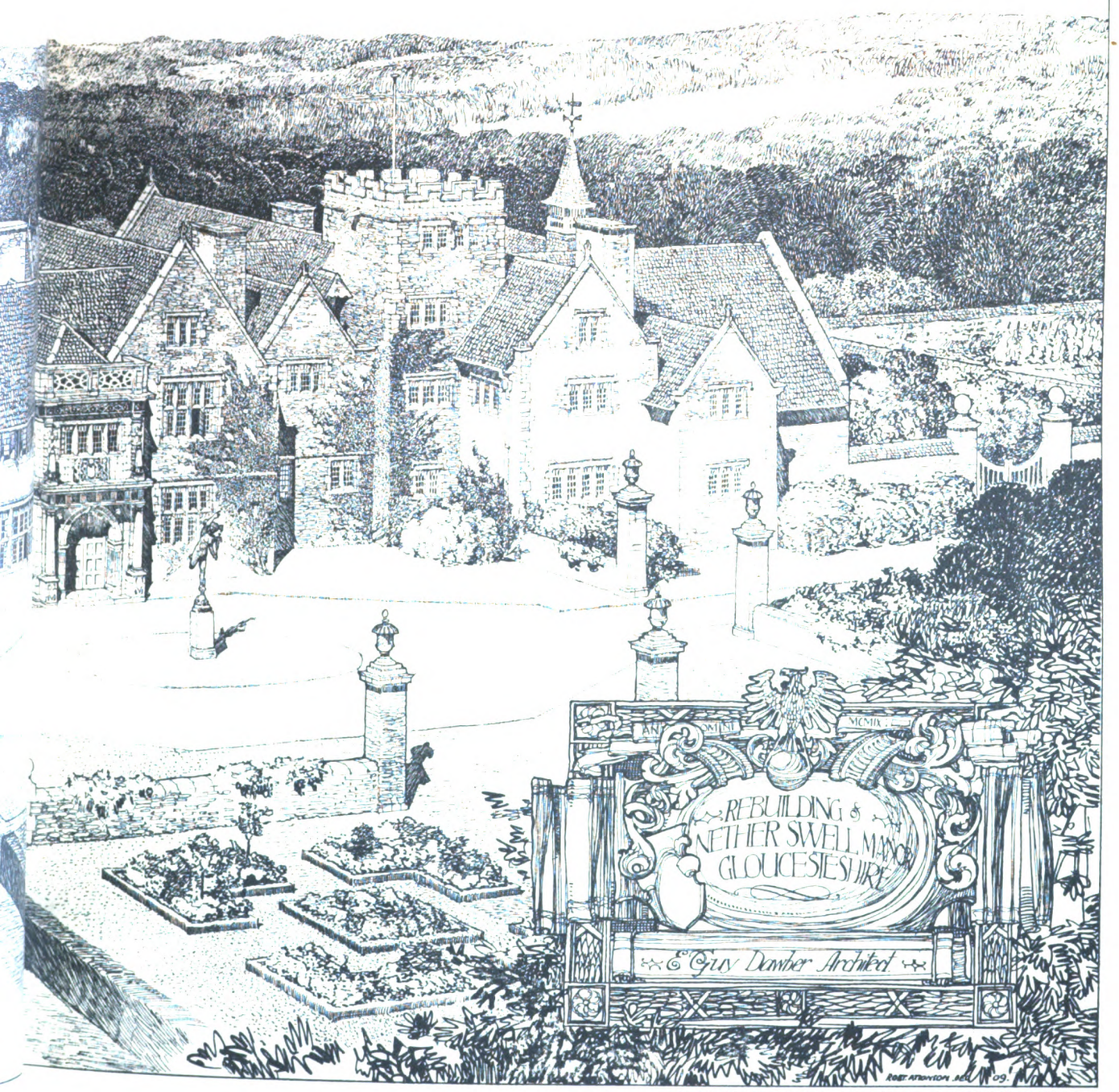


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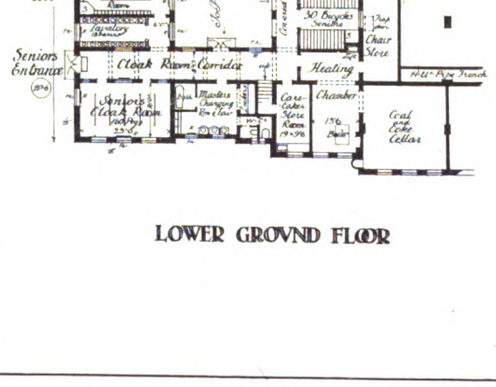
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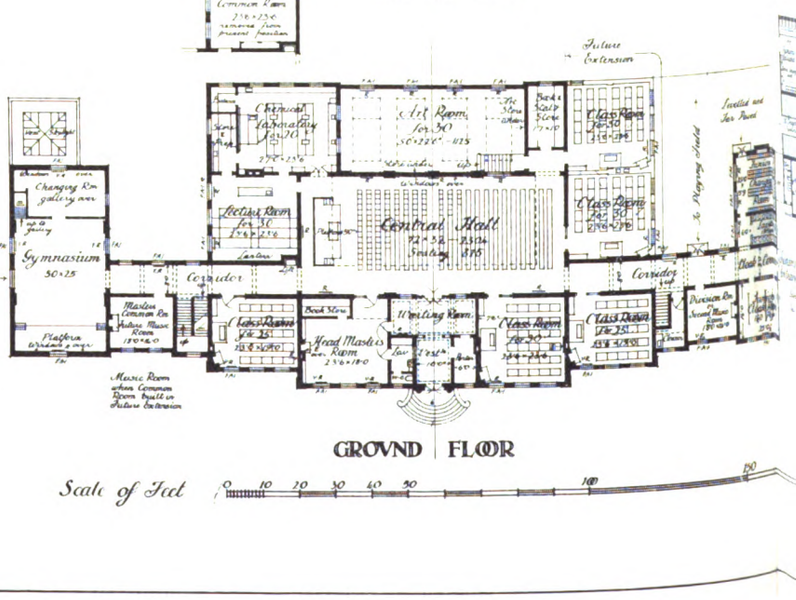


Heating by low pressure hot water pipes and with ventilating radiators in addition to the open ventilating fireplaces in all Classrooms

Lighting by electricity from the Borough mains



LOWER GROUND FLOOR



GROUND FLOOR

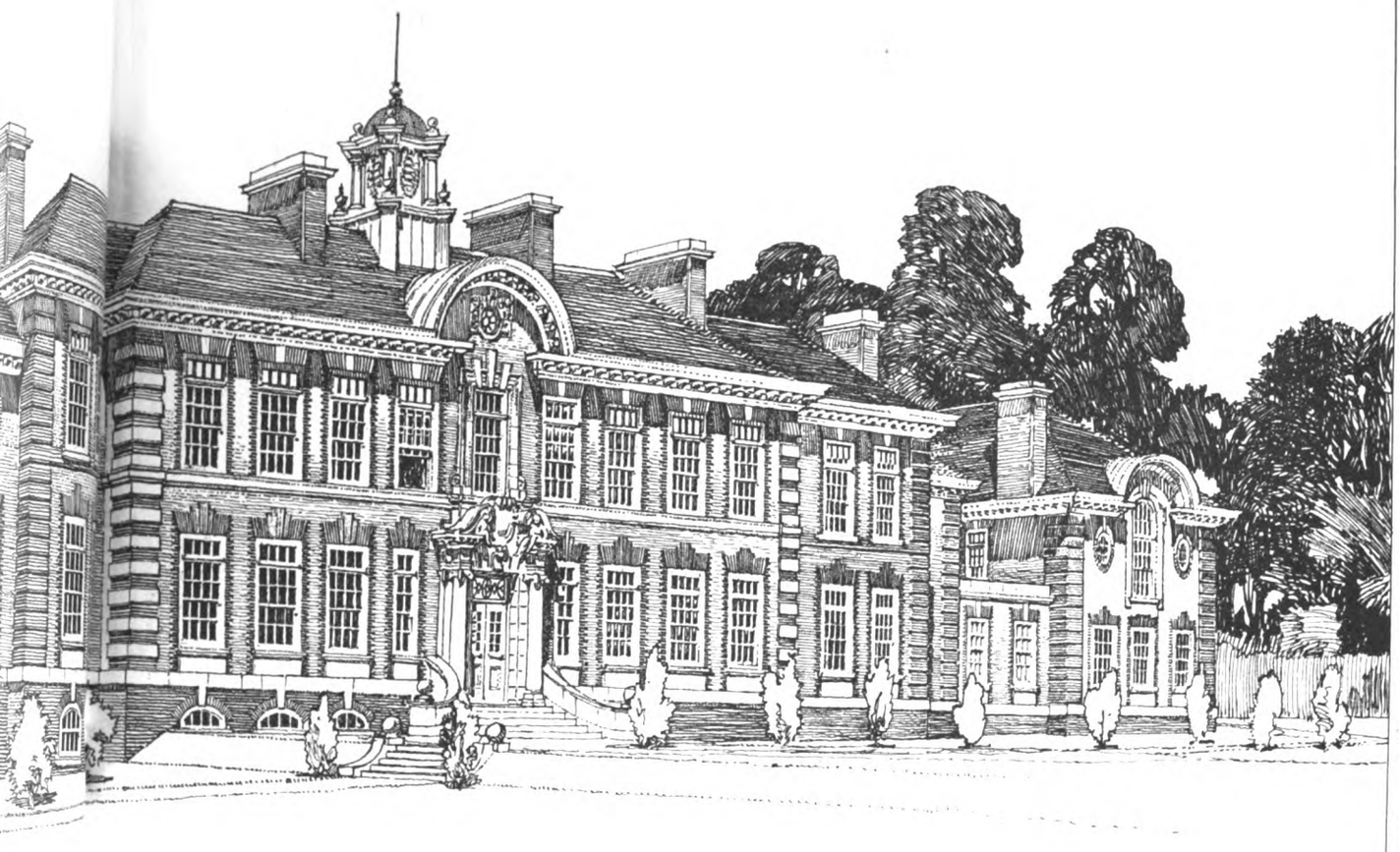
Scale of Feet 0 10 20 30 40 50 100 150

BOYS' SECONDARY SCHOOL FOR THE

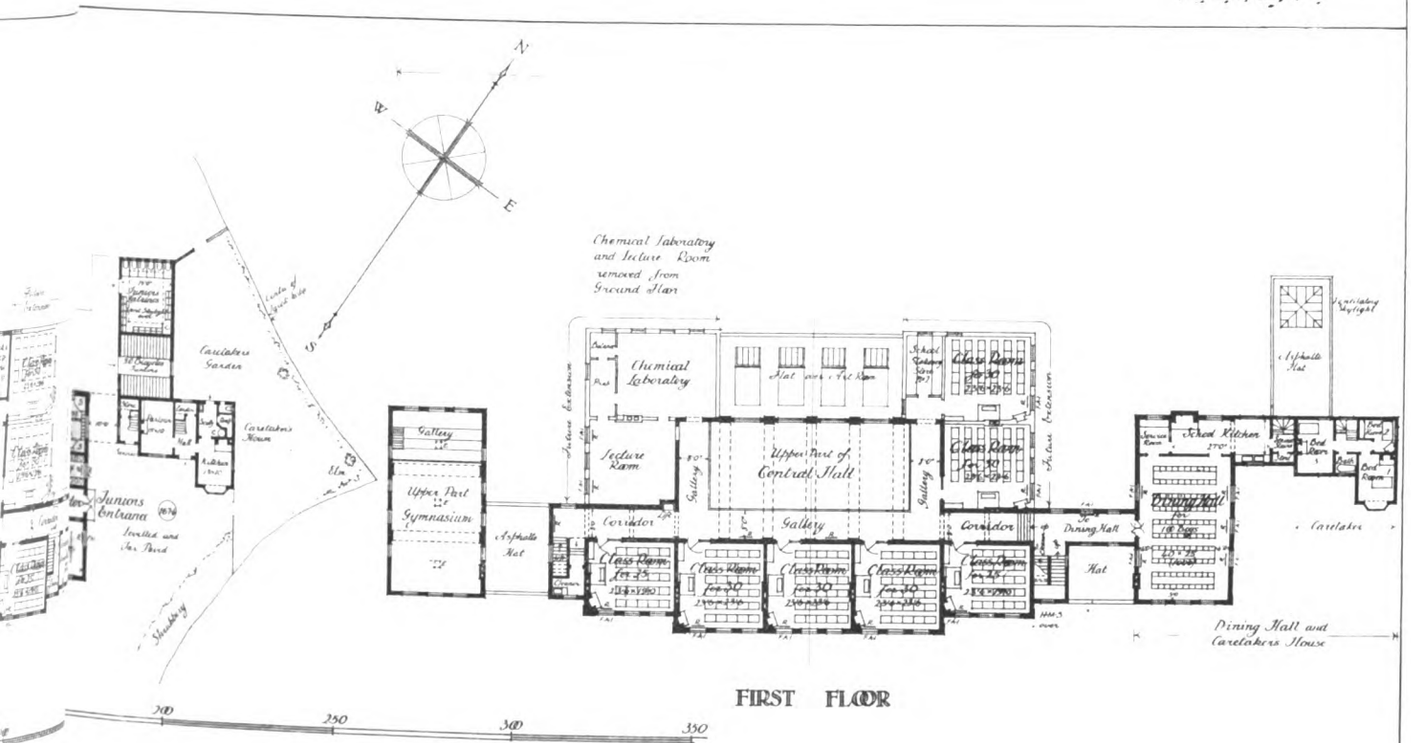
H. P. BURKE DOWNING, F.

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20 JUL 1909.



Geo Rusk Dowing
F.R.I.B.A.



FIRST FLOOR

PHOTO-LITHO. SPRAGUE & Co LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

RY SCHOOL, THE BORO' OF BROMLEY, KENT.
H. P. BURKE, F.R.I.B.A., Architect.

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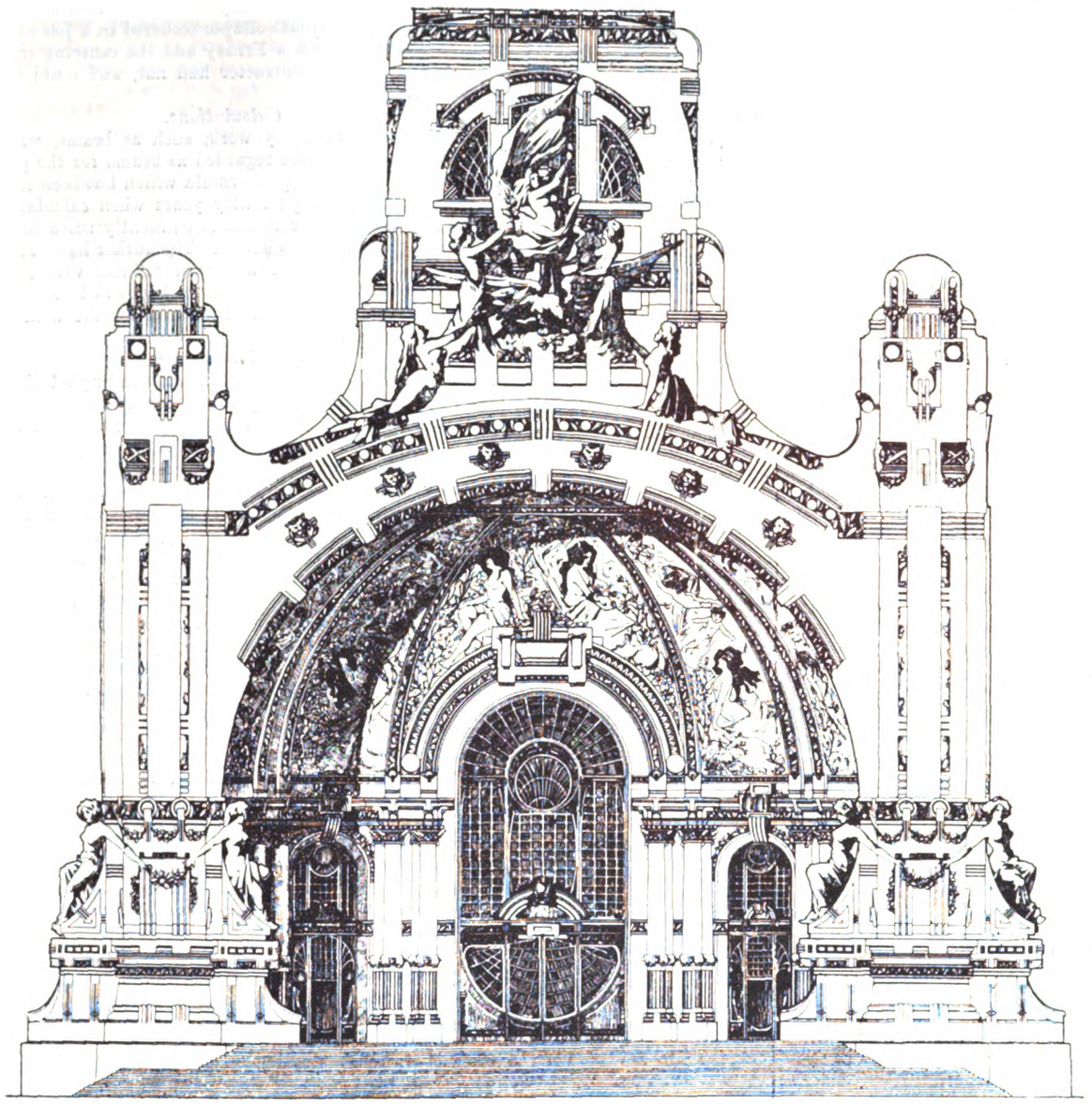
SHOPS AND OFFICES, WAKEFIELD.

PERCY ROBINSON, F.R.I.B.A., Architect.

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FRONT ELEVATION, PAVILION FOR PUBLIC MEETINGS, INTERNATIONAL EXHIBITION, BUENOS AYRES.

THE INSTITUTION OF MUNICIPAL ENGINEERS AT DURHAM.

THE Institution of Municipal Engineers has just completed the first year of its existence, and, judging from the quality of the papers discussed at the various meetings held throughout the year, the success of the movement towards advancing the status of municipal engineers, and the number and character of its membership, it may unhesitatingly be said that the Institution has established for itself a leading place among engineering societies. The roll of the Institution at the end of the first year was 613—556 members and 57 students, and it stated that the total now reaches about 650. The annual meeting was held last week at Durham, of which city the President of the Institution, Mr. J. T. Pegge, is engineer and surveyor. It must be admitted that the attendance at this meeting was disappointing in the extreme, and the discussion upon the papers suffered considerably. The Mayor of Durham briefly welcomed the Institution, after which the main business of the meeting was proceeded with. Mr. Pegge, who took the chair, announced that the annual report, also the balance-sheet, would be taken as read. With regard to the finances of the Institution, it is to be noted that in spite of the heavy initial expenses in connection with the formation of the Institution, there was only a very small deficit, which, if all arrears of subscriptions were paid up, would be converted into a handsome surplus.

The first paper on the agenda was by Mr. Horace Boot, consulting engineer to the Tunbridge Wells Corporation, on "The Design and Requirements of Electric Power Works." This paper has already been printed in these columns, and readers will have noted that it afforded little scope for discussion or controversy, being in the main descriptive of how a station, especially a small station, should be designed and fitted. It was a pity that Mr. Boot could not attend the meeting in order to explain the essential features of his paper and to amplify it, while it is a still greater pity that no one present should have risen to deal with points of detail. The only contribution to the discussion was a written communication from Mr. Verrall, whose main point was whether in the event of a bulk supply being obtainable, it was worth the capital involved of constructing municipal works when very advantageous terms could be made involving the local authority only in the erection of transforming and distributing sub-stations and mains. In his opinion, therefore, the relative advantages of a private undertaking and a bulk supply should be carefully weighed up in the first consideration of an electrical supply undertaking. Of course, in cases of small isolated towns, where coal is expensive, and consequently generating costs very high, the practice advocated by Mr. Boot might find much favour, especially when the merits of the Diesel oil engine are considered. There is no doubt that in the near future a very large number of smaller towns will have under consideration the question of electricity undertakings, such as Chichester, to which Mr. Boot made reference in his paper, and it is unfortunate that he was not present to give more details of this scheme, as it seems probable that with the low first cost of buildings the capital might be kept very low, and, provided this type of plant is as economical as is claimed for it, very substantial results might follow.

The next paper on the agenda, "Municipal History and Works of a Small City," by Mr. Pegge, we print elsewhere. It is likely to appeal more strongly to the archæologist and to

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the local historian rather than to the practical engineer, yet it serves to impress the spiritual and æsthetic aspects of the engineer's work, which the latter cannot afford to ignore. One cannot resist the impression on reading the paper of the remarkable improvement effected in local conditions during the past hundred years. It is also of interest to note how some of the problems which are prominently before us at the present day were dealt with in the distant past.

Mr. Pegge entertained the members to luncheon, after which a visit was paid to the main sewerage works, where the principal features were explained by Mr. Harry W. Taylor, the consulting engineer.

Later in the day the party visited the old castle built by William the Conqueror in 1070, and the ancient and historic cathedral.

REINFORCED CONCRETE.*

(Concluded from last week.)

Centring.

WITH reference to the design and erection of forms or centring for keeping the soft, wet concrete in place till it is properly set, there are two main conditions which must always be fulfilled. Firstly, it must be so supported and stayed that neither the weight of the concrete nor the ramming of it can make the centring bulge or sag; and, secondly, it must be as close-jointed as possible, otherwise the water will leak out and carry with it an appreciable amount of cement, which will weaken the structure. There are many methods of obtaining a smooth face on the finished concrete, such as painting the boards with oil or whitewash or any material to prevent the concrete adhering to them; but given fair flush joints in the woodwork, the passing of a thin piece of sheet steel (an old hand-saw with the teeth ground off is excellent for this purpose) between the concrete and the boards gives perhaps the best result whenever the general arrangement permits of its use. When work is to be floated or rendered, a rough surface is of course desirable.

The question of centring leads naturally to that of the length of time it should remain in place. The author is frequently asked to state his opinion on this in general, but no general or hard-and-fast rule is possible; on some jobs or portions of them twenty-four hours is ample, on others six weeks is too short. Much depends on the weather, particularly on frost, and much on the over-all scantlings of the various pieces, but, most of all and beyond everything, on experience; in fact, there is no material where experience on the part of the constructors is more important than in all matters connected with reinforced concrete, or where more disastrous consequences are likely to follow the lack of such experience. In this connection it is interesting to note the following extract from some remarks made by a gentleman who has done more than any other to place reinforced concrete on a firm basis—namely, Mr. William Dunn, F.R.I.B.A., who said in a paper which he recently read before the Concrete Institute and from which he has kindly given the author permission to quote:—

"Suppose, however, that the design has been carefully checked, initial difficulties got over and the work begun, the superintendence of the work is merely the transference of our anxieties into another field. I am very strongly of the opinion that no work of importance should be entrusted to men without experience; our best safeguard against defective work is undoubtedly the skill, experience and honesty of the contractor.

"No engineer or architect, unless he spends all his time during the execution of the work in actual and constant supervision, can secure his employer against dangerous errors on the part of the workman. In steel construction we can examine and measure every part after it is up; not so in reinforced concrete work. Once the concrete is laid we cannot tell, except by cutting into it, whether there are six 1-inch rods or two ½-inch rods inside a beam or pillar, or whether these are 2 inches or 4 inches from the surface. To see that the drawings are actually carried out requires a conscientious scrutiny and attention every minute of the time the work is being done. Much may be observed during a visit, but not everything.

"The number of skilled contractors, clerks of works and others constantly increases, and we shall soon all have had experience in this material. But with all the care possible there is a serious risk in employing an inexperienced contractor."

A contractor with considerable resources in the way of plant and materials is also very advisable. It is not long ago since a somewhat serious collapse occurred in a job where the concrete was put in on a Friday and the centring struck on the Monday, as the contractor had not, and could not get, any more timber.

Calculations.

Dealing with ordinary work, such as beams, walls and floors (which last can be regarded as beams for the purposes of calculation), the simple formula which has been in use by engineers during the past fifty years when calculating the strength of rectangular beams is eminently suitable for use in designing reinforced concrete. The author has made many calculations and tests to ascertain reliable values for the constant in that formula, which he hopes to be able to communicate at a later date, as also such for use with column and strut formulæ.

Standardisation.

The adoption of a series of constants in any set of calculations is useless unless the primary conditions governing the calculations are equal. For instance, the value of the constant just referred to is immaterial if the proportions of the concrete or the amount of reinforcement is altered, but these matters are becoming rapidly standardised, and if the proportions of one part of cement to two parts of sand and four parts of stone (this last all to pass ¾-inch mesh and refuse ⅛-inch) be adopted, the result need not be feared. This proportion may be also expressed for ordinary use—three 2-cwt. bags of cement, ½ cubic yard of sand and 1 cubic yard of stone, the mixture resulting in 1 cubic yard of concrete in place, as the sand and cement are only very little more than sufficient to fill the voids between the stones. This question of voids is important, because certain classes of stone lie much more closely together than others and it is therefore possible to economise in the purchase of sand, but this is entirely a matter for experience, as a glance at the mixing of the first batch will give more information than the most elaborate calculations.

As regards the percentage which the cross-sectional area of the reinforcement in tension is of the cross-sectional area of the beam or wall or floor, this varies between three-quarters of 1 to 2 per cent. but if 1½ per cent. is allowed for in ordinary work it is quite safe, and may be used as a standard for calculating quantities. Very frequently, however, both this matter and that of the proportions and ingredients above mentioned have little more than an academic interest for the general user. To take a very common illustration. A works manager decides to erect a travelling crane in one of his shops, and proceeds to order the rolled-steel joists to carry the wall-rails; he knows his loads and his spans, and that he can buy joists at so much per ton of such-and-such a section at such-and-such a weight per foot, which are guaranteed by some reputable steelmaker to carry the load required at the span decided upon (it must be remembered that we are not now considering any instance needing web or lattice girders, but strictly ordinary work only). He orders his joists without troubling about what proportion of carbon or silicon or anything else is contained therein, and the same procedure can frequently be adopted with regard to reinforced concrete, using the formula before mentioned or some other similar to find the scantlings, so as to get out the amounts of materials required in order to ascertain the cost. He, the works manager, may be quite certain that no reinforced concrete maker of repute will risk his name by putting in bad materials (or good materials wrongly disposed), any more than will the steelmaker with reference to the rolled-steel joists.

Methods of Using.

Reinforced concrete is now so largely and widely adopted that a list of even a portion of the various uses in which it has been already employed would extend to a great length. The following are a few remarks with reference to some of its better-known uses.

Buildings in General.

All buildings should be of skeleton framework construction. The spaces or panels between the columns and beams can be ⅛ inch filled in with reinforced concrete or with brickwork, or the whole frame covered with a skin of stone or brick; but as the main strength is in the frame, such panels can be quite thin, in fact only of such thickness as is needed for dryness, not for strength, which results in a large increase in floor area, particularly in the lower storeys, where otherwise the walls would have to be of considerable thickness.

Boats and Barges.

These have been successfully built for several years, and, provided several are ordered of one size—that is, made off the same moulds—they are very much cheaper than steel.

* A paper read at a meeting of the Institution of Mechanical Engineers at Liverpool by Mr. Arthur C. Auden, July 1909.

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Chimneys.

From current quotations these certainly appear to be cheaper than the same in brickwork, and of course do not need pointing; but there may be a difficulty when one needs to be felled, as at present it is not known how to bring one down in a small area. It is, however, a simple matter if there is space available for the chimney to fall in one length.

Drain and Sewer Pipes.

Many miles of these have now been laid, and are giving great satisfaction both as regards first cost and upkeep. Great care is, however, necessary in their manufacture to ensure the reinforcement, both longitudinal and circular, being exactly in its correct position, otherwise there is a great risk of the sewage or water reaching some of the metal and the life of the pipes being therefore very short. One of the great advantages of reinforced concrete sewer pipes, particularly in bad ground—for instance, over old mine workings—is that they do not cost any more per yard when made in long lengths, up to, say, 18 feet if required; thus about 75 per cent. in the number of joints is saved, and they are able to carry the weight of themselves and contents over spans practically equal to their own lengths. The same remarks also apply to water pipes.

Dock, Retaining and Reservoir Walls.

The author has already noted the saving in space in buildings due to the use of reinforced concrete, and the illustrations in fig. 7 show that such is even more the case

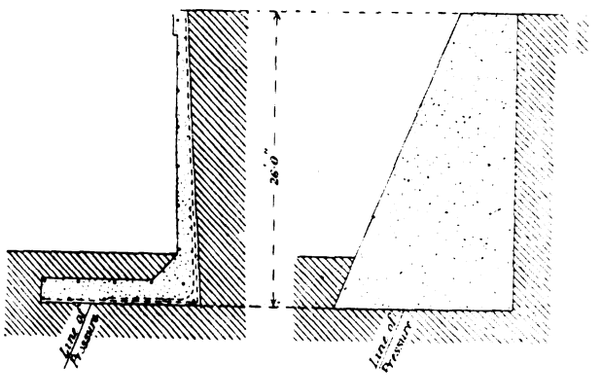


FIG. 7.

Comparison between amount of material required and useful space occupied in mass concrete and reinforced concrete dock or retaining walls.

with these walls, the one being in reinforced and the other in mass concrete. Both are drawn to the same scale, and calculated for the same strength with the same factor of safety.

Engine and Dynamo Beds.

Probably several of the members will remember the case of a large and important hotel in London having its own electric installation, where the vibration from its large turbo-alternator sets was a cause of serious complaint, notwithstanding the use of many different forms of soft anti-vibration materials beneath the beds. Finally reinforced concrete bed-plates were tried the same being practically replicas (in plan) of the cast-iron ones which rested on them, but only about 8 inches thick. These reinforced concrete bed-plates are very carefully reinforced and are only supported at points—that is, they do not rest directly on the old solid stone beds. The result has been very satisfactory, the difficulty of the vibration having been entirely eliminated.

Fence Posts.

The use of these is increasing very rapidly, but up to the present they are rather handicapped by the want of a cheaper method of attaching the wires to them, the ordinary hooks or staples being practically inadmissible, as they get bent and broken when the posts are bundled for carriage, and clips and bands or screw-plates are costly.

Magazines for Explosives, Safes and Strong Rooms.

Owing to its practically absolute fireproofness reinforced concrete is particularly suitable for these structures, and recent large and costly experiments in Germany have proved that even the explosion of huts containing 1½ to 2 tons of gelatine dynamite did no damage to their surroundings other than from the air-blast. It was found that the reinforcement was only rent but not scattered, and the concrete blown away in the form of coarse dust.

As regards safes and strong rooms it can only be said that, although a considerable number have been built, they are still awaiting an actual test at the hands of those skilled in the art of "safe-breaking."

Piles, Piers and Jetties.

One of the principal points to bear in mind when considering the use of reinforced concrete piles is that they will safely carry about three times the load of such in wood of the same cross-sectional area, also that they are no more difficult to drive; and, with reference to piers and jetties, the use of a material which does not deteriorate "'twixt wind and water" is a matter worthy of very careful consideration.

Pithead Gears and Pit Props.

These being fireproof is their strongest recommendation, and the latter, if made hollow, are, strength for strength, but very little heavier than ordinary wooden props.

Railway Sleepers.

As the most important question in relation to these is their life, not their strength, nothing but time will prove whether the use of reinforced concrete at a somewhat higher cost than wood will be the more economical in the end, but about five and a half to six years' experience of sleepers in continuous service under heavy traffic and rolling stock so far show no appreciable difference from the day they were laid down, and a recent order for over 100,000 of such shows that they are being extensively adopted.

Telegraph and Tramway Poles.

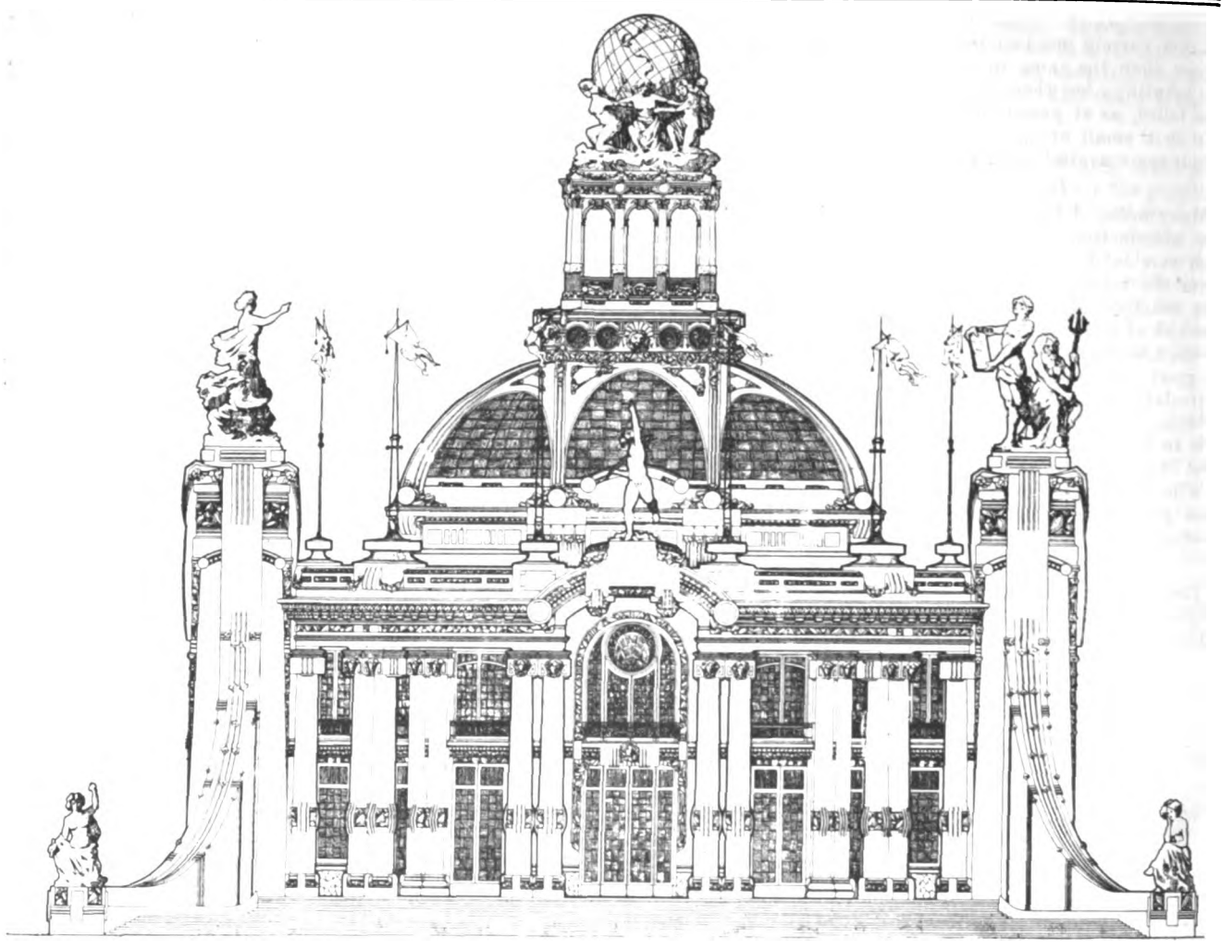
These are rapidly coming into favour, and very large numbers have been already erected. The fact of their not suffering from corrosion or rust, and therefore not needing painting, together with their being, at present quotations, considerably cheaper than steel, probably accounts for this demand. As they are tubular very great care is necessary in their manufacture so as to ensure that the reinforcement is absolutely accurate in position.

Painting.

The question of painting, although only now referred to, is one of vital importance with all reinforced concrete structures (other than buildings such as houses, offices, &c., which are usually plastered and papered), as it is well known that all naked steel and iron work deteriorates rapidly from rust and corrosion unless it is periodically very carefully scraped and painted. Even when this is done, the amount which is rightly deducted for depreciation in the case of a valuation for sale, transfer, mortgage or similar is very marked, in addition to the actual cost of such scraping and painting. This is particularly the case with bridges owing to their exposed position, and the expense of painting them is frequently considerably increased by the extra cost of the necessary cradling and scaffolding. All this is eliminated in the case of reinforced concrete, which increases in strength with age and is not subject to depreciation, nor are painting or scraping or other methods of preservation necessary. In fact, when comparing the cost of a reinforced concrete structure with that of a similar one in other materials, it is quite a good rule to work out the cost of the painting and upkeep, and, having capitalised the same at a rate per annum (say, 1 per cent. over the current Bank rate), to deduct this sum from the estimated cost of the reinforced concrete in order to place both propositions on an equal basis for purposes of comparison.

The author is fully aware that one of the very important questions relating to reinforced concrete from the users' point of view is that of the attitude regarding it of the various authorities, both those governing the country as a whole and those governing each municipal or county area. In some cases it is certainly true that serious restrictions have been placed on the use of this material, but these adverse views are rapidly decreasing, and it is only a question of time till they are eliminated altogether, in exactly the same way as the strenuous opposition to the use of iron and steel in buildings or in ships has now disappeared. With reference to municipal restrictions, in Liverpool they are more fortunate than in any other city in the kingdom within the author's knowledge, as each reinforced concrete proposal is considered solely on its merits. Not only must the plans be deposited as usual, but also all the calculations, which are carefully checked. If they prove satisfactory, permission is given to proceed with the structure as designed without any of the vexatious regulations, such as those regarding the thickness of walls, which are frequently enforced in other towns quite irrespective of what the said walls have to carry or the strength of the material of which they are composed.

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FRONT ELEVATION, GRAND CENTRAL PAVILION, INTERNATIONAL EXHIBITION, BUENOS AYRES.

MUNICIPAL HISTORY AND WORKS OF A SMALL CITY.*

THE history of any city of ancient note is more or less like that of other cities; but in the case of Durham with this difference, that until 1836 Durham city, as the capital of the palatinate of that name, was independent of the rest of the realm to a very great extent, and the Bishop of the See of Durham was its prince, and upheld these dignities in almost regal state, having his castles at Durham, Bishop Auckland, Bishop Middleham, Stockton, Craike and Howden (Yorks), Durham House at Durham Place in the Strand, London (now the Adelphi), and Norham Castle, on the borders of Scotland.

Durham city comprised four boroughs—Framwellgate, Gilesgate, the Barony of Elvet, and the Bailiwick, or city proper—being governed for nearly four centuries by a bailiff. About the year 1175—and history gives no record of earlier privileges enjoyed by the people of Durham—the first charter was granted to the citizens by the Bishop (Pudsey), and it was confirmed by the Pope at Rome. This charter was revoked in 1345, and in 1377 Bishop Hatfield granted to the burgesses and other good men in the city of Durham certain duties or tolls on divers merchandise or wares (of which a complete list is given) brought into the city, as an aid for defraying and supporting the pavements and the reparation of the walls of the city. In 1385 these powers, having been misapplied, were again called in. Between 1385 and 1565 the government of the city appears to have been retained in the hands of the Bishop, as a commission of inquiry was held in the fourteenth century, including among other things inquiry as to how certain moneys raised for paving had been spent. Then, about 1410, the Prior and Convent paid considerable sums for paving expenses, and it looks as though extensive public improvements were going on.

In 1450 Thomas Billingham, of Crook Hall (now within the north boundary of the city), conveyed to the burgesses a spring within the Manor of Sidgate, which supplied the pant or fountain in the market-place until 1850. The figure of Neptune in cast lead on the present pant was presented by G. Bowes in 1729. It may be interesting to note here that the bishops had their own mint, commenced in 1135 (King Stephen), and continued coining to about 1535—of which many specimens are extant. The coinage was mostly for poor relief purposes. This government by bailiffs nominated by the bishops continued until after the Reformation, when, in 1565, Bishop Pilkington, on January 30, granted a charter, whereby he ordered that the city of Durham and Framwellgate should be united, and appointed an alderman and twelve burgesses to be elected annually on October 4, who were empowered to publish laws and ordinances for the public benefit, to sue and be sued, and were granted a common seal, a weekly market, and three annual fairs, with power to hold a Court of Piepowder during the fairs. Their jurisdiction only extended over the parish of St. Nicholas and Framwellgate, excluding Milburngate. Crossgate was under the Prior and Convent, and had separate courts. Elvet was also under the Prior and Convent, and had a special charter from Prior Bertram about 1188, and the barony controlled beyond Court Lane (or Route en Roi). Gilesgate, or Gilligate, had its own government, grassmen, bakehouse, parish pound, and bull. These districts each had their own corn mills, worked by the river, at which the inhabitants were compelled to have their corn ground into flour. The charge was by "moulter," or one-sixteenth of the quantity taken for grinding. This was changed in 1822 into 6d. per bushel.

The granting of Pilkington's charter proved the commencement of an era of trade activity in the city. St. Nicholas Church became the official corporate place of worship, and the citizens evidently became proud of their municipal organisation, for in 1582 a townsman, Thomas Stout, left a drinking cup to the chief burgess, or alderman, inscribed "Yett God helpe," which is still in the possession of the Corporation. The city was governed by this charter, but it was found not to be sufficient for the growing trade and wealth of the city, and in 1602 Bishop Matthew granted the third charter, much more ample, by which the burgesses and inhabitants were constituted a body politic and corporate, consisting of mayor and twelve aldermen (for life) and commonalty, with divers privileges, liberties, free customs, with powers to make laws and regulations for the better government of the city. The 1602 charter appeared to consolidate and recognise the trades guilds, of which there were sixteen, most of whose coats-of-arms are hung on the walls

* A paper read at the annual general meeting of the Institution of Municipal Engineers, held at Durham on August 7, by John T. Pegge, President.

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of the Guildhall. These trades guilds enabled the mayor, as head, to govern the areas then outside the borough proper, for the reason that each guild had its Master, who, by virtue of that office, was an "alderman" of the city, and there were two members of the following guilds on the Common Council:—Mercers, Drapers, Skinners, Cordwainers, Saddlers, Butchers, Smiths, Carpenters, Masons, Tanners, Weavers, Fullers, and Dyers. The Guildhall is still, strictly speaking, the Freemen's meeting-place, in which they claim prior rights to the Corporation. All the guilds had their own silver plate, which the wardens for the time being have, together with their records and books, in their private possession. It may be known to most of you that up to the beginning of the eighteenth century the whole of the tradesmen in the principal boroughs were "freemen," and had their trade "guilds," to which membership was obtained by (1) birth; (2) servitude; (3) purchase. Birth: In some trades the eldest son only, in others all sons. Servitude: Seven years' apprenticeship with a freeman, under a proper parchment agreement. Purchase: This was generally a stranger wishing to commence business, who was called on to pay a sum, varying from 20*l.* upwards, in order to entitle him to all the privileges of "frieledge." The common people were not members of these guilds, and were the representatives of the "serfs" of earlier times.

The guild coat-of-arms (hand-painted examples being hung in the Durham Guildhall) of the several companies appear to be like those of London, York, and other ancient towns, but the grouping of the various trades forming a guild is very peculiar. The records of these guilds are still to some extent existent, and the massed plate of the Corporation and guilds makes a show that many a much more important centre of to-day would give worlds to possess.

In 1603 Letters Patent were issued appointing a Recorder. In 1606 a silver seal, still in existence, was presented by Matthew Pattison, the descendant of one of the original burgesses. Trade must have been looking up, for in 1617 the Market Cross, having twelve stone pillars, was built by Thomas Emmerson. This was removed in 1780, and re-erected to form the first attempt at a covered market, known as the "Piazzas," in the market-place along the south side of St. Nicholas Church. In 1621 a silver bowl was presented. In 1630 two large five-quart flagons were presented by Alderman Whitfield. In 1638 the sword and mace-bearers' badges were presented by Mayor Allenson, although the present sword and mace are not ancient. About 1617 Bishop Lord Crewe presented one silver tankard, six silver candlesticks, a silver loving-cup and cover, and a silver whistling pot and cover. There is also a silver christening cup, with the city arms engraved on it. Whilst on the question of city arms, it would be well if our City Fathers would determine on the city colours, as by usage we claim a gold cross on blue ground, but Goss's china and others show a red cross on a black ground, and a local archæologist says that either may be correct.* In addition to the Corporation silver, there are the constables' and watchmen's staffs, and the six city state halberds. The mayor's chain of office was presented by public subscription in 1870, and the mayoress's chain presented by Lady Anne Lambton in 1901.

In 1651 the Corporation purchased their borough from the Parliamentarians for the sum of 200*l.* Up to 1678 the municipal authority seemed to have its Roundhead and Cavalier tendencies to a great extent, when, owing to various disputes, the Council would not carry into effect the powers of the charter, and the government was again by bailiff. In 1780 a new charter was granted to the city by Bishop Egerton, with extended powers. This was of a quite up-to-date type, and invested eighty-nine commissioners with powers very similar to those possessed by urban district councils, such as preventing obstructions in streets, street repairs, drainage, lighting, appointing officers, collection of rates, the levying of tolls, &c. That there was need for some such powers may be seen from the report of John Howard, the prison reformer, who, on March 20, 1774, reported as to the prison at the north gate, in Saddler Street (now removed, except the underground prison cells), that there were no sewers, and dirt and ashes had lain there many months. Then from the middle of the seventeenth century each of the householders of the old and new Elvets had the quaint privilege of allowing four swine to roam in the streets. The charter last named existed until the passing of the Reform Act, 1832.

Durham, as capital city of the ancient palatinate of the Prince Bishop, still has its Court of Chancery, and is the centre of county council government, county police, and education. Its assize is attended in full state by the Judges and High Sheriff of the county.

The city has its own police, and controls its elementary education, but the modern unsatisfactory wasteful tendency of government by bureaucracy is very burdensome on the rates, and of course, as you know, both these and the Health Department are largely governed from London.

Comparatively little is left of the city wall and gateways having any special interest, that on the river bank east of the cathedral being most complete. All the quaint houses of the eighteenth century and before have disappeared, excepting a carved timbered house in Owensgate and Sir John Duck's house at the rear of Silver Street, and several houses of secondary note in Bow Lane and South Street, Crossgate, New Elvet, and Milburngate, so that we are poor in domestic antiquities, but, as if compensating for our loss, there are still the castle and the cathedral, with their cloisters and palaces, now also shorn of much of their stateliness, but not, we are thankful to say, of their dignity.

Streets.

In the 1773 Paving Act the offices of surveyor to the several parishes or townships within the city of Durham and borough of Framwellgate, having no public road or highways, were extinguished, and it was enacted that a surveyor should be appointed by the commissioners. His duties were "the maintenance of present and future pavements, sewers, drains, or watercourses, as well in the footpaths as carriageways, and of all lamps, lamp irons and posts, and to cause, order, and direct all or any of the present and future pavements in the said streets—as well in those parts used by foot passengers as used by carriages—to be taken up and the said streets, &c., to be paved, repaired, raised, lowered, or altered, and also the sewers, drains, or watercourses to be cleansed, altered, and amended, and also such footpaths to be paved with flagstones or smooth pavement, and all the horseways, carriage-ways, with good ragstones, pebbles, &c., and also shall cause, order, and direct the several streets, lanes, ways, and public passages and places to be cleansed and lighted, and all annoyances, obstructions, nuisances, and encroachments to be removed, and proper sewers, drains, sinks, gutters, and watercourses to be made for conveying water off and from the said several streets, and the several houses and buildings within the city, borough, suburbs, and streets. And the said commissioners or any seven of them may contract with any persons for paving, raising, lowering, amending, repairing, cleansing, &c., and all and every the works done in pursuance of this Act to be inspected by their surveyor or surveyors, or such other person as they shall from time to time appoint. And their surveyor, having an order in writing from the commissioners, may search for, dig, gather, and carry away any stones (flagstones and kerbstones excepted) gravel, sand, or other materials proper for the raising and repairing of the said streets, &c., out of and from any waste ground or common, river, or brook, in any parish, township, or place in or within three miles from the said city, without making any compensation, and also flag and kerb stones, making compensation for the same. Such surveyor or other persons filling up the pits or quarries, levelling the ground, or sloping down the banks, or railing, or fencing off where such material shall have been taken from, so that the same may not be dangerous to passengers or cattle, and if any person or persons shall obstruct, hinder, or molest any surveyor or other officer, workman, or person who shall be employed in the performance of their duty under this Act, such person shall for the first offence forfeit 20*s.*, then 30*s.*, and after 3*l.* No person shall make any alteration to the pavements upon pain of forfeiting the sum of 10*l.* without the consent of the commissioners. No branches to be made into drains without leave under a penalty of 20*l.* All private drains which shall communicate with any of the public drains, sewers, or vaults shall be repaired and cleansed under the inspection and direction of the surveyor at the cost and charges of the owners or occupiers."

The streets of the city in 1816 were evidently mostly unpaved (or were covered with rough sandstone slabs bedded in earth, as had been the class of paving used for generations on the roads in which the priors and deans and chapter were interested), as they were described "as soft as an Irish bog, and not paved with stones point upwards as some other towns." Not much notice was taken of complaints such as this, but on May 2, 1820, tenders were asked "for keeping in good and sufficient repair the horse and carriage ways

* It is the function of the Heralds' College, not of the City Fathers, to determine the correct arms of the city.—Ed.

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within the city of Durham and suburbs thereof," the contractors to find all material. However, matters went on much the same until in 1822 the township of Gilesgate was fined at the Easter sessions 80*l.* on account of the imperfect and dangerous state of its streets, and the parish of St. Nicholas was allowed till next sessions to put its streets in repair. Indictments were also applied to the whole of the streets in the line of the Great North Road—viz., Church Street, New Elvet, Elvet Bridge or Souter Raw, Sadler Street, Market Place, Silver Street, Millburngate and Framwellgate, and were of a wholesale description:—

1. The wretched condition of the streets, all of which are at this time in an indictable state, and two of them (as above) actually under indictment.

2. The flagging, which is rendered perfectly useless in wet weather in consequence of the houses not being spouted, and which is receiving great injury from the droppings on it.

3. The intolerable and most disgusting nuisance of the butchers' shops on slaughtering days, as offensive to common decency as it is horrible and shocking to human nature.

4. The practice of wheeling into the streets in the middle of the day every species of the most abominable filth that can possibly be collected together.

5. The defective lighting of the town.

6. The discontinuance of the watch since 1815, so that the present police is supported by voluntary subscriptions.

Surely this is an extraordinary glimpse into the state of towns in these times, and Durham is quite typical of Newcastle, Sunderland and other towns. At any rate, these rigorous measures seemed to do some good, for I find the first advertisement for flagging in June, 1822, "to be not less than 3½ inches thick," and to take no more than three to a super. yard. Again, the commissioners voted 20*l.* on February 4, 1823, to be expended in clearing the streets of snow, the work being completed by the 6th, "but the snow is still falling."

The first mention of McAdam's system here was in 1823, as being less expensive than paving, though in 1821 the following advertisement would suggest that McAdam and his system had taken hold:—"Wanted, a general surveyor, to take the superintendence of about 75 miles of road upon four turnpike trusts in the south of Durham. The salary will be not more than 300*l.* a year, and the gentleman must be perfectly acquainted with McAdam's system of making and repairing roads, or make himself so, and produce a certificate of his sufficiency from Mr. McAdam before he enters upon the office." This rather smacks of examinations.

In Durham city in September, 1823, the pavement of Hallgarth Street was taken up and macadam substituted. In February, 1824, a public meeting decided to repair the street of Old Elvet on the plan of Mr. McAdam.

In May of this year, however, we learn that "doubts have been entertained of the expediency of Mr. McAdam's new system of road-making, as far as regards towns from the great annoyance occasioned by dust. A discovery, however, has just been made by Mr. Gilmore, surveyor of the road between this city and Tynebridge. It consists of the application of a portion of the bittern, or oil of salt, which has not only the effect of completely laying the dust, but it operates also as a cement, making the pavement at once firm and smooth, while the expense will in all probability be less than by the application of water." Apparently some other streets in the city were converted into macadam roads, but in September, 1830, it was decided to pave with stone, repair and maintain the street from the Claypathgate to the toll-bar in Gilesgate. After the severe winter of 1830 it was decided by the Dean and Chapter to employ the starving labouring men out of work at 2*s.* a day improving the public walks in the vicinity of the town, and the public subscribed 191*l.* 19*s.*, while the Chapter gave 200*l.* In deciding on this 2*s.* a day the following table was considered:—

Year.	Wages per day.		
	s.	*d.*	
1350 . .	0	2	would buy 1¼ peck of corn
1450 . .	0	4	„ 1 „
1550 . .	0	8	„ 1 „
1650 . .	1	2	„ ½ „
1750 . .	1	0	„ 1 „
1800 . .	2	6	„ ⅝ „
1820 . .	1	10	„ ⅝ „
1830 . .	2	0	„ 1 „
1909 (to-day)	2	6	„ 1½ „

By this time the streets appear to have been put into order.

It will be interesting to learn that in 1831, under the Paving Acts, the following toll-bars produced per annum:—Framwellgate Gate, 310*l.*; Butterby Lane Gate, 251*l.*; Gilligate Gate, 231*l.*; Hallgarth Street Gate, 55*l.*; Stonebridge Gate, 58*l.*; and Ushau Lane Gate, 12*l.*; or a total of 917*l.* In 1844 the toll-bars produced 822*l.*, and in 1846 only 630*l.*

In 1801 the city population was				7,628
„ 1811	„	„	„	7,953
„ 1821	„	„	„	9,814
„ 1901	„	„	„	14,659
„ 1901	„	„ (including added area)		17,200

Now, assuming the same rateable value per head, viz., 4.5*l.*, in 1801 as in 1901, the rateable value would then be 34,326*l.*, or 1*d.* rate would bring in 143*l.*; so that the toll-bars would only produce an amount equal to a 6.42*d.* rate, and this to provide for all the lighting, repaving, and scavenging under the Paving Acts, exclusive of maintenance of the various parish workhouses, of which there were five. In 1808, in St. Nicholas alone, the pauper expenses were 1,500*l.* per annum, and the rates were one-third to one-half of the annual value of properties in that parish. For the year ending March 31, 1908, the total rates for the parish of St. Nicholas were 6*s.* 5*d.*, inclusive of police, education, poor, county, and other purposes.

By the year 1840 the whole of the principal streets of the city were paved with cobbles, with local sandstone flags and kerb. These were replaced by granite paving and Pateley Bridge flags up to 1860, when Caithness flags were partially used for the first time. Then, about 1870, the streets were repaved with granite, with, in places, granite wheelers, 6-inch Fifeshire black whin kerb, and generally with Caithness flags.

Since 1900 Old Elvet and the Baileys have been tar-paved, and York non-slip granite face concrete and Barnard Castle flags have been used, as well as Caithness flags and Fife kerb. There is no wood, cork, or asphalte paving, these being considered unsuitable for a district where the horse-shoes must be chisel caulked to enable loads of 12 cwt. to 16 cwt. to be hauled.

The two bridges are repairable by the county, who appropriated an ancient fund arising from lands in Gilesgate for that purpose, which in 1846 produced annually 24*l.* 15*s.*

The Council have recently put in force the Private Street Works Act.

We receive from the county council the sum of 330*l.* per year for the repair of 1.434 miles of macadam road, and such extra amounts agreed on after having had plans and estimates for larger improvements approved by the county surveyor. The remaining 18.116 miles of roads cost at the annual rate of about 85*l.* per mile for repairs and renewals, exclusive of all watering and scavenging, and provision of new paving for existing setts. It must be borne in mind that some 9.62 miles are paved, or not yet repairable by the inhabitants at large, so that this would make the fair cost about 170*l.* per mile. I have for several years tried dust-layers, Westrumite, Akonia, and Crempoid, and used the latter again for our miners' day, July 24. I have had a trial length of road surface tarring done.

After hard work, I am glad to say that in 1905 Major Norton recommended an extension of the city boundaries, which took place in November, 1906, with the following result:—

	Acres.	Houses.	Population.	Rateable Value.	Miles roads.
Old city	884	2,732	14,772	56,256*l.*	16.00
Added area	181	444	2,220	9,500	3.55
Total	1,065	3,176	16,992	65,756	19.55

General Works.

It would take too long to give details of works that have been contemplated, and in most cases carried out. Wherever possible, all specifications and quantities are printed, quarto size, with a short form of legal agreement and schedule of prices, a pattern I copied from Mr. Creer, late of York, as the best of its kind I have known. These apply alike to "supplies," such as horse-food, farriery and veterinary work, cartage, roadstone, limewashing lanes, scavenging, painting, disinfectants, flags, kerbs and channels, setts and brushes, and also to special contract works, viz., flood prevention works, tar macadam, baths, plumbing and repairs, water mains, private street works, new carts and covers, alterations to stables, electric bells, electric wiring, fever hospital repairs and relining, weights and measures office, box for sick horses, town hall alterations and windows, corrugated shed and straw store, fire brigade apparatus, baths, destructor furnace, &c., ferro-concrete bridge and weir, riverside retaining wall and river protec-

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tion works, connections to Mannesman steel sewers of private house drains, alterations and repairs to gas engines, pumps and pump well, underground lavatories, cast-iron sewers and junctions on brick piers, alterations to police station, &c.

This form, used with care, has the great advantage of avoiding claims for extras, excepting, of course, the unavoidable "extensions" which occur from time to time.

(To be continued.)

OUR CONTEMPORARIES FROM OVER-SEAS

THE *American Architect* now illustrates some additional buildings in Atlanta, Georgia, and also the Peabody Library of the University of Georgia at Athens, in that State, a classical building mainly in brick with stone dressings. The examples from Atlanta do not impress us favourably. There are some interesting illustrations of designs by students under the *régime* of the Society of Beaux-Arts Architects, which show how it is endeavoured to give American architectural students the benefits of the Parisian system of instruction without coming to Europe.

Deutsche Bauzeitung continues its illustrations "architectural and otherwise" in connection with the International Archæological Congress at Cairo held in April last. Our contemporary also gives, with illustrations, an account of the new Old Catholic Church at Cologne, the design of which by Herr Peter Recht is based upon the Romanesque work of the Rhine provinces, simply and broadly treated.

Moderne Bauformen shows by several illustrations of the work of Eliel Saarinen of Helsingfors how the "new art" movement has penetrated even as far north as Finland, and quite remarkable in their power of composition and simplicity of detail are some of these designs, notably that for the Landtag's building at Helsingfors. The work of Professor Otto Prutscher, of Vienna, at the International Photographic Exhibition at Dresden gives us some very satisfactory treatments of internal architecture. Amongst the other illustrations worthy of note are those of Messrs. Esch & Anke, of Mannheim, who do not always follow "new art," but use conventional motifs with freedom and originality.

La Construction Moderne, with an appreciation by Alfredo Melani of the charms of Genoa, gives us an illustration of the Villa Paradiso near that city. As exemplifying the influence of the architecture of Genoa, Signor Melani refers to the Palais Bagatti-Valsecchi at Milan, of which also illustrations are given, and of which the proprietors are the architects, with considerable indebtedness to the old work of the fifteenth and sixteenth centuries.

The *Architectural Record*, in its review of architecture in the United States, now deals with "The Skyscraper," in which it is made evident that Americans realise the evil of these "mercenary monsters," and joins in the dirge:—"These leagues of buildings, describable and indescribable, are not beautiful, but sinister. One feels depressed by the mere sensation of the life which created them—life without sympathy; of their prodigious manifestation of power—power without pity. They are the architectural utterance of the new industrial age." Not only the evil these monstrosities do to the light and air of the city, but the imminent risk of a catastrophe from fire is emphasised. An interesting article is included on Artistic Parisian Shop-fronts, with illustrations of a dozen examples.

The *Engineering Record* has an interesting description of the shoring and underpinning of a tall church steeple, consisting of a tower 92 feet high, with a slate-covered timber spire rising to 146 feet from the street level. This is the steeple of St. Paul's Catholic Church, in Vicksburg, Miss.

COMPETITIONS.

AT the last meeting of the Keighley education committee it was recommended that the proposed mixed school for Highfield—which will include a central hall—should provide for 240 new school places, the details to be arranged by the sub-committee; and that architects residing or carrying on business in Keighley be invited to send in competitive plans, along with estimate of cost and tenders.

Nine designs were submitted for the proposed Pilgrim Fathers' Memorial at Southampton, and last week that by Mr. R. M. Lucas, Bar Gate Chambers, Southampton, was accepted. The base of the monument jutting some 16 feet from the sea wall carries a corbelled projection in the form of a prow of a ship. Its sculptured figure-head is Hope, raising her anchor and bearing a wreath, from which garlands depend. The eight panels of the pedestal are intended to be of bronze in low relief, and a group of three figures considerably above life size completes the composition. The materials are Portland stone and bronze. The cost of the constructional work, including a pile foundation, is estimated at 650*l.* This leaves for the sculpture, the carving, and bronze panels, and the lamp standards a balance of 1,350*l.*

A SPECIAL meeting of the Stoke Town Council was held on August 12 to receive the award of the assessor (Mr. Leonard Stokes) in the competition in connection with the town hall extension scheme. The following letter had been received from Mr. Stokes, dated July 30:—"A careful examination of the designs sent in for the town hall extension competition will, I think, show that the sum of 25,000*l.* is hardly adequate to meet all your requirements. However, of the less costly designs, I am of opinion that the best is No. 33, and the second and third respectively Nos. 1 and 37." The committee reported as follows:—"Your committee having carefully considered the same and made a detailed inspection of all the designs submitted for competition, cannot recommend that any one of them is of such a character as to justify the Council in carrying it out, mainly on account of the excessive price. Your committee also further report that having made a further inspection of the designs placed first, second and third, they are of opinion that as the cost of the first and third materially exceeds the sum of 25,000*l.*, they are disqualified under rule 15 of the conditions, and that other sufficient reasons exist for not adopting such designs. With respect to the design placed second by the assessor, although they are not prepared to recommend its adoption, your committee consider that as regards cost it more nearly conforms to rule 15, and that therefore the premium of 100*l.* should be awarded to its author." The committee recommended that the whole matter should be reconsidered. It was explained that the names of the authors were unknown to any member of the Council. The design placed first by the assessor was estimated to cost 29,000*l.*, and the one placed third would cost 30,853*l.* The design placed second was estimated to cost 25,015*l.* In accordance with the recommendation, the matter was referred to the Council in committee. The designs placed first and third by the assessor being disqualified, the Council have not opened the envelope containing these competitors' names. The authors of the design placed second are Messrs. Warwick & Hall, of Gray's Inn, W.C.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Brick Clay a Mineral.

SIR,—By his statement on Monday last that brick-clay is a mineral, and will be treated as such for the purposes of the Finance Bill, the Chancellor of the Exchequer has established a precedent that will not only involve most serious consequences for owners—and ultimately for lessees—of brick-clay property, but one that is likely to have a far-reaching effect upon owners of clay property of all kinds.

The question which I put in the House of Commons reads as follows:—

"Whether, in view of the facts that Mr. Justice Buckley, in the case of the Great Western Railway *v.* Blades, in 1901, said that within the decision in the case of Glasgow Corporation *v.* Farie, in 1888, 'the same clay may be a mineral in one district and not in another';

"And that both these cases are cited in that of the Great Western Railway *v.* Carpalla United China-clay Co., Ltd., to which the Government referred on June 21 last for the general meaning of the word 'mineral';

"And that no common brick-clay has, since 1888, been held to be a 'mineral' for the purpose of receiving compensation under the Railway Clauses Consolidation Act of 1845, the Chancellor of the Exchequer will specifically declare common brick-clay not to be a 'mineral' for the purposes of the Finance Bill?"

To this Mr. Lloyd George has replied:—

"There is no doubt that brick-clay is a mineral in the ordinary acceptation of the term, and it is not proposed in the Finance Bill to make any exception of brick-clay.

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"The cases referred to do not affect the general question. They merely decide that, for the purpose of undertakings for which land is acquired under the Railway Clauses Consolidation Act or the Waterworks Clauses Consolidation Act, brick-clay forming the surface of the earth is to be treated as land to be acquired under the ordinary provisions of those Acts, and not as minerals, which are subject to special provisions."

Now this position is neither equitable nor consistent.

It is not consistent because on June 16 last, before Clause 12, taxing ungotten minerals, was dropped in favour of the present mineral rights duty, the Chancellor of the Exchequer said:—"Any minerals which have a separate value as such will be liable to duty under the Finance Bill. Clay in the Thames Valley has no separate market value at all." Yet Thames Valley clay is now to be taxed, at all events at places like Reading and Maidenhead, where it is used to manufacture bricks.

The Chancellor of the Exchequer's present position is inequitable because for over twenty years—ever since the case of Glasgow Corporation *v.* Farie—the Courts of Justice, from the House of Lords downwards, have consistently refused to allow brick-clay to be a mineral for the purpose of receiving compensation from railway companies that have acquired clay property under the compulsory powers of the Railway Clauses Consolidation Act of 1845. How, then, can Mr. Lloyd George explain the equity of treating as a mineral for the purpose of paying money under his present Bill, the identical clay which has never been allowed to be a mineral for the purpose of receiving money by way of compensation under the Act of 1845? Moreover, no Court of Law has ever pronounced common brick-clay to be a mineral anywhere; so that the opening statement of the Chancellor of the Exchequer's reply to my question, that "there is no doubt that brick-clay is a mineral in the ordinary acceptation of the term," constitutes an absolutely new departure from the legal point of view, and a bold one at that.

China-clay and fire-clay we have long known to be minerals. We now learn that common brick-clay is to be a mineral, notwithstanding legal decisions to the contrary.—Yours faithfully, H. G. Montgomery.

43 Essex Street, W.C.: August 19, 1909.

Angles in Greek Architecture.

Sir,—Does not Omar Khayyam say in one of his Rubaiyat:—

> "The moving finger writes, and having writ
> Moves on; nor all your piety and wit
> Shall lure it back to cancel half a line;
> Nor all your tears wash out a word of it"?

I perceive Mr. Aitken's moving finger is again at work, and I fear that I have neither enough piety nor wit to get even half a line cancelled; but oh! if tears would avail, how I would shed them!

What, Sir, is the meaning of this week's extraordinary presentation? Mr. Aitken shows us that a certain relational line gives 67½° in Bassæ and Theseion temples, and he carefully avoids showing us that a similar line in Selinus gives 64° and in Concord gives 66⅞° (approximately). He shows us that another relational line gives 22½° in three cases, though he avoids showing us that in the fourth example it gives 20°. His method of selecting angular direction for diameters differs strangely in different examples, the 60° being reckoned from extremity to centre, the 67½° from extremity to extremity, and the 45° spanning an additional column and spacing beyond the 67½°.

And so the miserable procession continues. As I ventured to write recently, it is nothing but juggling—and very poor sleight of hand at that.—Faithfully yours,

Percy L. Marks.

Albert Buildings, 49 Queen Victoria Street: August 16.

GENERAL.

The Newcastle Society of Antiquaries propose to transfer their library from the Castle to their Black Gate premises. The cost will be 300*l.*, and of that sum nearly one-half has been collected.

Under the Direction of the Office of Works, a general process of renovation is being carried out in the Houses of Parliament—so far as the unusually prolonged sittings of the two Houses will allow. A number of the famous paintings, including those depicting the meeting of Wellington and Blucher at Waterloo and the battle of Trafalgar, are being "restored," and the inscriptions at the foot of some of the older stone statues have been re-cut and otherwise made more legible.

A Scheme for erecting a public hall with market place under it in Broad Street, Pershore, at a cost of about 3,000*l.*, has been abandoned in favour of a smaller scheme for buildings costing about 1,000*l.*

The Portslade Urban Council have instructed the clerk to ascertain from the Local Government Board if sanction was likely to be granted for a loan of 5,000*l.* for the erection of a town hall, also the longest term likely to be granted; the surveyor to ascertain and report upon eligible sites.

A Proposal to establish a Jewish Hospital in London was approved at a mass meeting last week. A site of 20,000 square feet has been selected at Stepney Green, which will be submitted to a committee at a conference to be held shortly.

Amongst the new schools which have recently been erected at Bristol to meet the demands of the growing population in the outside districts are those in Sommerville Road, built by Messrs. Humphries & Son from the designs of Messrs. Gough & Sons, of Bristol. The whole of the stone used is St. Aldhelm Box Ground from the Box Hill quarries.

Mr. George Harwood, M.P., is presenting to Bolton a monument inscribed with the leading historical dates in the borough's history. Some fine monoliths of Dartmoor granite have been cut from quarries at Merrivale, near Princetown, and these will form part of the monument. The circular base will measure 10 feet in diameter and the shaft will be 20 feet high. On the top of the column a large bronze cross is to be fixed, and on the four sides of the square block bronze shields will be placed containing historical inscriptions, commencing with 1253 A.D., when a charter was granted. The site is that of the Old Market Cross in Churchgate, which it resembles. The memorial has been designed by Messrs. Bradshaw & Gass, architects, Bolton.

Mr. Munro Ferguson, M.P., in the House of Commons last week, asked the Lord Advocate whether the attention of the Secretary for Scotland has been called to the published annual reports of the Director of the Royal Scottish Museum and to a recent official return from which it appears that during the period of ten years ended March 31, 1908, the sum of only 1,274*l.* was expended in Scotland on the purchase of sites, erection of buildings, and extension of existing buildings, while in the same period 550,597*l.* was expended for similar purposes on the London museums, and will he say whether any steps are being taken to provide the increase of accommodation required by the Royal Scottish Museum? The Lord Advocate, in replying, said the question will be considered when the estimates for 1910-11 are being settled.

Mr. William Ford Stanley, J.P., F.G.S., F.R.A.S., &c., died on the 14th inst., in his eighty-first year at his home in South Norwood. He was for half a century head of Messrs. W. F. Stanley & Co., Ltd., a name which must be familiar to all architects, engineers, surveyors and builders. His own merits as a scientist made his position well-nigh unique in providing for the requirements of the learned professions. Many famous men have acknowledged their indebtedness to his encouragement and business acumen. On retiring from active life Mr. Stanley bestowed in 1903 on South Norwood a public hall and art gallery, at a cost of 13,000*l.*, the design being entirely his own. He added a clock tower and second hall, and afterwards erected and equipped the Stanley Technical Trade Schools, where boys receive general education and technical training combined. They have been endowed with property valued at 25,000*l.* Under a trust deed executed with the Charity Commissioners the future administration of the schools and the halls is fully provided for. Mr. Stanley was made an honorary freeman of Croydon in 1907, and in the same year a clock tower was unveiled in South Norwood to commemorate his munificence.

At the Mansion House fire prevention improvements are in progress. The work is being executed for the Corporation on plans and suggestions made by Mr. Sydney Perks, F.R.I.B.A., city surveyor. The general scheme is the separation of the Egyptian Hall from the domestic offices and State apartments by means of steel doors. Special attention is being given to the Egyptian Hall, as it is erected immediately over the kitchens. Iron and steel doors are also being erected in the State drawing-rooms and the saloon, and an iron and glass screen will be placed at the east end of the Egyptian Hall. Iron gangways are being placed on the roof to facilitate the escape of the domestic staff, and fire alarms and appliances are being overhauled and hand extinguishers provided throughout the building. The cost of these works will be over 1,000*l.*

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The Architect.

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FORTHCOMING EVENTS.

Saturday, August 28.

Architectural Association: Camera and Sketching Club, Visit to Hayes, Harmondsworth, and Harlington.

Thursday, September 9.

Paint and Varnish Society: A paper will be read entitled "The Painting of Plaster," by Mr. W. Fourniss.

Saturday, September 11.

Society of Architects: Students' Sketching Party.

Architectural Association: Camera and Sketching Club, Visit to Guildford and district.

Monday, September 13.

National Association of Master House Painters and Decorators of England and Wales: Annual Meeting at Sheffield, September 13 to 18.

BRICK-EARTH AS A MINERAL.

THE thanks of all concerned with building are due to Mr. H. GREVILLE MONTGOMERY, M.P. for Bridgwater, for having obtained from the Chancellor of the Exchequer a definite answer to a question that is of considerable importance to architects and their clients, to builders and their customers—the question whether common brick-clay is or is not a "mineral" and so liable to the taxes to be borne by "minerals" under the provisions of the Finance Bill.

In our correspondence columns last week Mr. MONTGOMERY has given verbatim the text of his question and of the reply of Mr. LLOYD GEORGE. The Chancellor has decided that brick-clay is a "mineral" for the purposes of his Finance Bill and that he does not propose to make any exception of brick-clay from the minerals that are to pay tax. He thus sets his dictum, that of a provincial Welsh solicitor, against the carefully weighed decisions of numerous judges of the High Court from the House of Lords downwards, who have ruled that brick-clay is not a "mineral" and therefore deposits of brick-clay compulsorily purchased by railway companies are not entitled to special compensation on account of their value as "minerals."

Of course Mr. LLOYD GEORGE's law varies according to the political exigencies of his position at the moment. When he is arguing in favour of a tax on ungotten minerals, the absurdity of taxing all the clay in the country was too great even for him, and he declared that clay has no separate market value as a "mineral" and therefore would not be taxed as an "ungotten mineral." Now having dropped the tax on ungotten minerals and substituted another on mineral rights, clay is exalted to the sublime rank of a "mineral" and as such expected to pay tax. Such are the shifts of an inconsistent Chancellor of the Exchequer. Never mind the law—when a country practising solicitor becomes Chancellor the rulings of all the judges in the country, impartial and unprejudiced as they are universally admitted to be, must be put on one side and his dictum becomes the law of the realm.

Mr. LLOYD GEORGE's decision to tax brick-clay seems to be as deficient in justice or equity as in law. When brick-clay is to be debarred from receiving compensation under the Railway Clauses Consolidation Act or the Waterworks Clauses Consolidation Act it is not a "mineral," but when Mr. LLOYD GEORGE wants to raise money on it, brick-clay is a "mineral."

It is quite an open question whether Mr. LLOYD GEORGE was not quite right when he declared that "clay in the Thames Valley has no separate value at all." Bricks are frequently made and sold at prices that after deducting the cost of labour and fuel in making, interest on cost of machinery and proportionate rental of land at an agricultural value and a reasonable profit on these leave nothing for the separate value of the clay as a "mineral." Therefore at these prices there is nothing in the clay that can be properly taxed as "mineral" value. Now it is notorious that in the brick industry prices of the same bricks vary largely, and if these particular bricks at bottom prices do not allow anything for the value of the clay as a "mineral" can it be fairly said that any proportion of the profit they obtain at top prices is due to the value of the "mineral"? Is it not due to other causes, to the operation of the law of supply and demand? Thus at top prices no profit on the "mineral" remains to be taxed.

There is another aspect that concerns the advisability as a matter of national interest in the taxing of the value of such a "mineral" as brick-earth. Every such tax must add, if it is collected, to the retail price of bricks made in Great Britain, and the margin between the price of native bricks and those from foreign countries is already very small and needs but the slightest enhancement to enable the foreigner to dump Dutch, Flemish, German, or French bricks on our market and to undersell the native producer. Thus the attempt on the part of a Liberal Government to mulct the individual who presumably owns some of the more valuable soil of the country is bound to benefit the foreigner at the expense of those engaged in a native industry, to say nothing of the fact that a tax on brick-earth must of necessity add to the cost of building and so still further increase the severity of periods of depression such as that from which the building industry now suffers. When there is a slump in building it will be more acute than before and when there is a boom the foreigner will get the advantage by having a market prepared for him in which he can successfully compete by reason of the taxation of the native source of wealth.

Mr. GREVILLE MONTGOMERY, as the editor of the *British Clayworker* and as the member of Parliament for a constituency (Bridgwater, Somerset) to whom the brick and tile industry is of considerable importance, was essentially the right man to tackle the Chancellor of the Exchequer for a clear pronouncement as to whether brick-clay is or is not to be taxed under the provisions of the present Finance Bill. Now the brickmakers and the brick users of the country know that it is the intention of Mr. LLOYD GEORGE that they should be especially taxed. It is not the owner of the brick-clay who will pay the tax, but those who buy his clay, whether in the form of bricks or as raw material. This will continue as long as the clay-owner can find a market. When the tax prevents him from using, letting or selling his land at a higher value than he can get for it as agricultural land, the clay will remain where it is, an "ungotten mineral," and the Chancellor of the Exchequer will have nothing to tax.

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Thus it seems to us that not only is Mr. Montgomery—and from his position he knows what he is talking about—perfectly right in his contention that the tax on brick-clay is neither legal, equitable nor consistent, but there are other very weighty arguments against the taxation of brick-clay, particularly from the point of view of national interest.

NOTES AND COMMENTS.

From the fact that Sir Aston Webb's name is announced amongst those eminent artists who as members are supporting the Imperial Arts League, we presume that it is not the intention of the founders to leave architects outside their pale or to tacitly exclude them from the ranks of "artists." The objects of the League are, as stated, certainly in some respects concerned with matters architectural—"to make appeals for the national and municipal support of art," "to promote competent and just art criticism," "to promote the interests of artists at international and other exhibitions" are activities in which architecture is capable of being benefited as much as any other form of art, and notwithstanding that architects have their own organisations that to some extent, more or less, already work on these lines, there need be no cause for jealousy on the part of these existing organisations at the formation of another body which may help forward some of the work that they themselves are doing. It is very desirable that every effort should be made to familiarise the general public with the fact that architecture is an Art and therefore it is desirable that architects should become members of a League which appears to have excellent backing from the published names of those who are already amongst its members.

The ignorance of the present Chancellor of the Exchequer in respect of the actual business methods of the country is in nothing more forcibly exemplified than in the proposed taxation of apparently unearned increment in the case of building land. This is clearly expressed in a letter to the daily Press by Mr. T. F. Smith, an experienced speculative builder. In this it is pointed out that, as is well known to all who have occasion to look into the matter, the present-day speculative builder makes no profit on the houses he builds and sells to the public: nay more, he very frequently sells the house at less than its actual cost to him, making his profit on an improved ground rent, which, to the ignorant, may appear as "unearned increment," but which is really the profit on the employment of skill, labour and capital expended on the building of a house. The ordinary man buys a house manifestly cheap but forgets or does not realise that the often highly inflated ground rent of which he also accepts the responsibility is part of the price of the house and not wholly of the land on which it is built.

The collection of casts that has been recently transferred from South Kensington to the British Museum and for want of better accommodation has been housed temporarily in an iron shed, is a valuable field for study of Greek and Roman sculpture, although far from being complete or capable of ranking with some of the great collections abroad. Still, we must be thankful for the opportunity of seeing examples of the work of Praxiteles, Scopas, Paionius, Myron, and Polycleitus, besides that of later Greek schools and of the best Roman classical work.

Education is the chief industry of Edinburgh, and the position of the new art school which has now been a year in existence is therefore of some importance. The site was provided by the city authorities and the funds for the erection of the building were obtained from public monies and private contributions, particularly that from Mr. Grant, of Kincorth, so that the city of Edinburgh is in possession of probably the finest art school in the United Kingdom at a minimum of cost to the citizens. The cost of maintenance is also very largely borne by public funds as distinct from those of the city, and hence a good art education is possible at low fees without any great tax on the ratepayers. Under these conditions there is no reason why Edinburgh should not once again hold the high position as an educational centre in art that belonged to it formerly, before it was crippled by subjection to the rigid rule of South Kensington.

"Treasure Trove" has its own law, and therefore the "inquest" held at Yeovil on an interesting gold torque of the late bronze age and probably dating between 500 to 800 B.C. is worthy of note. The torque was found in a lump of clay in the course of building operations and sold to the Somerset Archæological Society for 40*l.*, and half its additional value, if any. No more appropriate holder could be imagined, as it is the only example found in Somerset, although several have been discovered in other parts of the British Isles. The jury found that "there is no evidence that it has ever been in ancient times hidden or otherwise concealed."

The object for which low side windows were constructed in mediæval churches is not one capable of indubitable explanation. They are often supposed to be "leper windows," intended to permit those who, on account of their affliction, were prohibited from entering a church to see the elevation of the Host, and so take part in the services of the Church. Sometimes, however, it is clearly impossible that a person outside the church could, through a low side window, see any part of the ritual of the Mass, although he might be able to hear the sound of the Sanctus bell and the chanting of the service. Such conditions have suggested that these low side windows were for the purpose of hearing confessions, and this view was urged at a recent meeting of the Archæological and Architectural Society of Durham and Northumberland, on the occasion of a visit to the church of Alwinton, by Mr. David Dippie Dixon of Rothbury. Mr. Dixon gave his view that in this instance, at any rate, the low side window was a confessional window of the mendicant friars, and in support of that view gave the following quotation:—"Thomas Bedyll, Clerk of the Council in the reign of Henry VIII., and one of the Commissioners at the visitation made on the suppression of religious houses and chantries, in a letter to Thomas Cromwell, says:—We think it best that the place where these friars have been wont to hear outward confessions of all comers at certain times of the year be walled up, and that use to be done for ever."

An improvement in the Housing and Town Planning Bill is the new clause of which Mr. Burns has given notice, providing that commons and open spaces shall not be appropriated for housing without the consent of Parliament, unless other suitable land, of equal area, is to be given in exchange and become common. The new clauses in Mr. Burns's name to prevent the acquisition for the purposes of the Housing Acts of "any land which is the site of an ancient monument or other object of archæological interest," are obviously such as ought to have been included from the first.

There are two sides to the question that is now causing some bitterness of feeling in the Church of England *à propos* of the use of her churches for purposes scarcely in a strict sense of the nature of religious services. There can be no question that our cathedrals were built exclusively for the purpose of regular and continuous worship. Now they have become to a large extent places of entertainment and amusement, both for those who go to see the records they form of the art and history of the past and for those who go to hear the productions of the works of great musicians. For these entertainments there has been a growing tendency to make special and definite charges. Sixpence to see the chapels, 2*s*, 6*d*. or 5*s*. for licence to sketch and photograph, and now for the Festival of the Three Choirs at Hereford Cathedral a graduated scale of prices for seats from 5*s*. to 15*s*. according to position. On the one hand it may be urged that those who have the advantages of the special form of entertainment that a cathedral affords, the study

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of art, whether in the form of architecture, sculpture or music, should pay for the increased expense that such advantages entail in the provision of a staff and upkeep of the fabric. On the other hand, it is equally competent to allege that the tendency to graduated charges is clear evidence that the payments required are not regulated by the cost of the facilities granted, but by the extent of the entertainment provided, and therefore that the function of a cathedral or other church as a place of worship is superseded. This is a subject that may well form the basis of discussion at the forthcoming Church Congress.

The British Fire Prevention Committee has published its report on a number of interesting fire tests with doors, which appear to have been held simultaneously, and therefore afford valuable data for comparison. Four doors were tested, one an "armoured" door, one an iron door, and two composite doors, constructed and supplied by the Check Fire Door Company. The object of test in each case was to try if any of the doors could be classified as affording "full protection." As this means resistance to a fierce fire of four hours' duration with a temperature gradually rising to about 2,000° Fahr. it is scarcely surprising that the classification was not obtained. Such power of resistance is hardly necessary in the case of any door, but the doors of the Check Fire Door Company seem to us, from the report, to have established their superiority over the "armoured" door and the "iron door" in question.

It is abundantly clear that it was impossible for Chippendale and Sheraton to make or even supervise the production of all the furniture with which their names are associated, even of that likely to be genuine old stuff, and it is well, therefore, that clear evidence of the making of furniture worthy of these masters by unknown craftsmen should be preserved. In the fifth volume of the third series of the "Archæologia Æliana," the publication of the Newcastle Society of Antiquaries, there is an article on "The Company of Free Joiners of Newcastle," in which reference is made to a beautiful card table marked in pencil "John H. Goodnick made these tables, Anno Domini 1794, July 4, prentice to Jack Wilson," and a bow-fronted mahogany cabinet, in the manner of Sheraton, which bore the name of Richard Caranaby, and dated January 1, 1806.

COMPETITION FOR THE NATIONAL MUSEUM OF WALES.

THIS is the most important open competition promoted since that for the new County Hall for the London County Council. The cost for the completed building is to be a round quarter of a million, inclusive of carving, but exclusive of sculpture. It is thought that about one-third of the building will be erected in the first instance. The site is to be a portion of the Cathays Park of Cardiff that has been set apart for the erection of several great public buildings, and in which the City Hall and Law Courts, University College, the Welsh University Registry Office, the Glamorgan County Hall have already been located. The site for the Museum faces the City Hall, and the building will form a balancing feature in the general composition to the Law Courts. Thus, both in position and magnitude, the National Museum of Wales will be one of the most important of the public buildings of Cardiff.

The accommodation to be provided may be grouped in three sections—exhibition galleries, rooms for study, administration and work rooms. The exhibition galleries are subdivided into eight separate departments:—(1) History and antiquities, (2) geology and mineralogy, (3) Welsh natural history, (4) zoology and botany general, (5) industries, (6) art, (7) children's room, (8) aquarium. The administration and work rooms are to provide for (1) court and committee, (2) director, (3) keepers of departments with workrooms, (4) library, (5) printing department, (6) photographic department, (7) workshops, (8) macerating room, (9) sterilising room, (10) stone and plaster room, (11) lecture rooms, (12) refreshment room, (13) elevators, (14) stores, (15) service court, (16) porter's room, (17) telephone exchange, (18) lavatories, cloak-rooms, &c.

There is to be, as there should be in every important competition, a jury of assessors—Sir Aston Webb, R.A., John Jas. Burnet, A.R.S.A., and Edwin T. Hall, F.R.I.B.A.—and, "unless some adequate reason exists to the contrary," the author of the design placed first by the assessors will be appointed architect for the Museum, whilst premiums of 200*l*., 150*l*., and 100*l*. will be received by the authors of the designs placed by the assessors second, third, and fourth respectively. The appointment of the author of the design selected as the best as architect of the Museum is "subject to a bona-fide tender from a reliable contractor or contractors being obtained for carrying out the work within 10 per cent." of the author's competition estimate, subject to any modification for alterations.

The competition drawings required are plans of each floor, four external elevations, two sections, to one-sixteenth scale; a half-inch detail of a portion of the main front, with a section showing the internal treatment; a block plan to the Ordnance scale of one in five hundred; a perspective view 18 inches wide. The drawings are to be sent in on or before January 31, 1910.

ARCHITECTURE: ITS TRUE PRINCIPLES.—XVII.

By R. OWEN ALLSOP.

The Geometric Basis.

THE arguments that we have advanced apply more powerfully to mass—or design in three dimensions—than to mere elevational subdivisions; for here we see that the primordial geometric figures are of rigidly mathematical proportions. The sphere pleases. The cube, the equal-planed tetrahedron please by their sense of matter—arrangement in what we call order and symmetry. All the grandeur and dignity of architecture rests upon some combination of these and like forms. They were not designed by man, being co-eternal with nature and the natural. If architectural design had its nobility originally in complicated and elaborated form, then no building could compete in beauty of effect with the wedding-cake. Hence we conclude that the *straight line* either as a boundary or as an axis is the true margin of the most dignified architecture, and that the effect is moral, as well as physical and optical.

The main outlines of architecture—when dignified—is an affair then of geometrical form; and a plain rectangular building may be so broken up by secondary members that the basic original of the mass may be almost lost. Still it is the primal cause of the majestic and imposing of even a forest-like array of pinnacles and buttresses; for the pinnacles make out the right line at all similar points of the design. There may be no special interest about an oblong brick-built box and simple roof, but such a structure holds its own and expresses dignity where the heterogeneous broken group tells of nothing but haphazard origin—the work of the patcher who constructs by "throwing out" excrescences here and there after the manner of the mole. It is more than anything the expression of definite purpose that we are conscious of in the plain rectangular composition. Besides this each plane is given its utmost value and therefore its dignity is enhanced. The axis and the plane rectangular plan are the cause of the impressive rectangular mass. In such a simple cubical composition the fullest weight is given to the effect of light and shade—the greatest amount of dark and the greatest amount of light—all giving breadth. It may be taken as a rule that, where the common-sense plan is a plain rectangle, it is senseless to break up the composition with the idea of adding effect. On the other hand, the unnatural and forced formation of a rectangular block—that is where it is plainly resulting in inconvenience, is to be deprecated, since here is where enters the chance for æsthetic composing of, and variety in mass.

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If building consists of harmoniously-disposed rectangular and curvilinear form, architecture must consist of the æsthetics of such form—their ultimate art effect. The highest expression arises from fitness for duty, but the fact does not assist very far in design: it is rather a touchstone to demonstrate success—a compass to show the broad general direction. If architecture is judged by (*a*) fitness or suitability and (*b*) expression of purpose, there yet remains (*c*) the pure æsthetic effect, as where sharp angle contrasts to the round and smooth, as may be put diagrammatically in a sketch such as fig. 39. It is here that geometrical regularity and symmetry are controlling factors. It must be remembered that form may be fit (for building) and yet not beautiful. In other matters, it is difficult to show that what



FIG. 39.

we should judge an ugly nose was not suited to its purpose. It seems generally acceded that we cannot study architectural form except *in situ*—in the building. If we photograph vertically up a lantern tower, the piers, beautiful in their correct position, may present, in the picture thus given (of an apparently horizontal position) that which is positively ugly and weird. On the other hand, it can be shown that mere fitness for duty is not the sole cause of beauty in architecture, for all kinds of girders and stanchions are evidently most fit and suited for their duty, yet by common consent are void of true architectural beauty of expression—for one reason, possibly, that for a generous margin of power and great excess of stability is substituted a mean, commercial "factor of safety."

If any variety of universally-admired architecture be examined, its elemental forms can be assigned either to that which is angular or curvilinear. The most fanciful of curved forms are not apparently essentials in architecture. Rectangularity must be considered the base of architectural form, all kinds of curves, even the cylinder, being subordinate. If we omit the not absolutely necessary carving and sculpture, the forms seen in severe architecture are cubes, parallelopipeds, cylinders, prisms and the like, and curves of one, or at the most two directions. It seems, therefore, reasonable to suggest that the study of the art of harmoniously correlating such and like forms, *per se*—that is, irrespective of their specific exemplification in old buildings—should be one of the first efforts of the student of architecture, if he aspires to something more than parrot-like reproduction of ancient handiwork. It may be that no *laws* are to be discovered—similar to the fundamental basis of musical harmony—but it is only necessary to continuously direct the attention to this aspect of architectural design to become eventually aware that there are numerous forms and combinations of forms that pain the eye, much as a false note in music pains the ear. Unfortunately, while the false note fades away, the intrinsically ugly form, in architecture, persists.

If we consider the main distinctive species of solid architectural form to be either rectangular or curvilinear, we may suggest that the one is, to the eye, sharp, spiny and aggressive, the other smooth and oleaginous. The idea suggests the contrast of oil and vinegar to the palate, or the effect to the touch of a blind man of a small cube and of a sphere, and the greater interest in the feel of an egg than a spherical body. In all architecture, excepting the most rude, is some mixture of rectangular and curvilinear form; but it has been shown by many accurate observers that the most impressive appearances pertain to rectangularity—the effect in perspective of rectangular and rectilinear figures. Obviously, however, the sharp sets off (enhances) the smooth and *vice versâ*, so that we might be tempted to say that the *flavour* of an architectural composition was referable to the amount of "oil" and "vinegar" therein—their relative proportion.

It has been suggested that the plain cylindrical column has an effect of *sleekness*. There may be a good deal in this, which, however, does not condemn this column, but suggests that the oleaginous element is here in excess or wrongly applied (as a column against a smooth, bare wall), and that the smoothness of the column should be properly contrasted to its opposite. It is certain that plain, cylindrical, attached columns require much ruggedness round about them—a principle that has been most elegantly applied in the upper storey of the bold and refined Institute of Chartered Accountants, where the wall surfaces between the plain columns are broken into a wealth of sharp angular masses.

All this can only be seen in the true natural way—that which the architect calls "perspective." If we run our eye up the angle of St. Paul's campanile, the varied play of geometrical position and form leaves an impression of harmony. The cause is beautiful planning. All fully-modelled architecture—as contradistinguished from a skin-deep, elevational scratching of a pattern—shows an appreciation of the fact that a circle is a circle and a cube a cube. A Doric column is architecture complete in three dimensions, and the pleasing effect of a mere flat plan having a circle inscribed in a square is exhibited to the eye in the solid as a contrast of a real rectangular mass to a real curvilinear one, all harmoniously subordinated to the self-same axis. Two-thirds of the beauty is based on geometrically beautiful planning, yet we find abundant serious discourses on the principles of Greek architecture with sole reference to and solely illustrated by elevational drawings.

The study of architecture as a composition of surfaces having planes at various angles and curves of various kinds awakens an interest wholly wanting where the art is regarded as based primarily on the reproduction of old forms. The sculptor exhaustively studies the human form. The correct study for the architect is geometrical solid form, its æsthetic effects, based on fitness for duty and expressiveness of purpose as something foundational. Egg-and-tongue and dog-tooth must be regarded solely as pearl necklaces. It requires to be understood that whereas a façade has but one elevation, it may have a great number of different plans—or horizontal sections—which, as the eye is directed upwards at increasing angle become dominant in the ultimate effect, reducing the position of elevational matters to one of quite secondary importance. It is difficult to see how there can be beautiful building without beautiful planning, and a certain measure of the final resultant beauty can always be seen in the mere pleasing effect of harmoniously disposed squares and circles and other superficial geometrical figures on the plan itself. Considered in this light, Architecture = Plan^2 × Elevation. All great works show masterly planning, not merely practical but artistic. To run one's eye up a façade composed of parallel lines leaves the impression of monotonous bell-tolling—a repetition of the same note.

It must result that the architect should be pleased with the effect of the mere contrasting and other harmonies of square, triangle and circle—not to the end of exhibiting these as superficial diagrams on an elevation, but that they may be displayed in conjunction with elevational proportioning, and result in perspective architecture.

(*To be continued.*)

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PART I. OF THE FINANCE BILL 1909 AND THE CONSTITUTION.

By W. S. Holdsworth, D.C.L.

THE report of the General Council of the Bar upon appeals from the Commissioners under Part I. of the Finance Bill, 1909, which we print below, is of a great deal more than merely legal interest; and, though the Government has given way upon this question of appeals and restored the jurisdiction of the Courts, it still possesses a very practical interest and importance, because it raises an important question of constitutional law. That the provisions of the Bill upon this subject were unconstitutional is admitted, we take it, by the concession of the Government. But how many more proposals of a like character are contained in the closured clauses? This question is most important, for upon the answer to it obviously depends the legality of any amendment which the House of Lords may make to them. It may be that the House of Lords cannot amend, and can hardly reject an ordinary Finance Bill. It is clear that a wholly different question is raised when it is asked whether the House of Lords may or may not amend or reject proposals contained in a Finance Bill which run counter to the whole spirit of the constitution. Such proposals are not necessary parts of a Finance Bill; and to add them to such a Bill is to revive the old device of tacking—a device adopted in the late seventeenth century, and long since objected to by the House of Lords, and discarded as unprincipled—whereby the House of Lords were obliged to pass a measure to which it was thought they objected by tacking it to the Finance Bill of the year.

What do we mean, then, when we say that a proposal is unconstitutional? The term is proverbially vague in English law. We have no written constitution like that of the United States; and anything enacted by Parliament is law, for Parliament is a sovereign law-making body. The term, therefore, cannot mean simply illegal. If it did, no statute could be described as unconstitutional, since no statute can be illegal. The term is generally used to mean that there is something in a proposal opposed to the spirit and the unwritten principles of the constitution. The law of the constitution is founded on principles for the most part unwritten. These principles are assumed as a basis and a starting point by all our great constitutional statutes—by the Petition of Rights, the Habeas Corpus Acts, the Bill of Rights. Laws or proposed laws which infringe these principles are rightly described as unconstitutional. No doubt this gives a certain vagueness to the term which deprives it of some of its force. Politicians use it on slight grounds as a term of abuse. But whatever the practice of politicians, we do not think that lawyers are in the habit of using the term of any measure unless it really does infringe some vital principle of the constitution. The report which we are considering supplies us with an excellent example of an unconstitutional proposal. It is clear that the clauses of this Bill which dealt with appeals from the Commissioners in matters relating to the increment value duty, the reversion duty, the undeveloped land duty, and the mineral rights duty offended against two vital principles of English law. The first principle is that persons whose interests are affected by a taxing Act should be able to bring the question of the interpretation of the Act and of their liability under it before the ordinary law and the ordinary Courts of the land. The second is that persons who dispute their legal liability should be able to employ skilled advice to defend their interests.

The first principle was clearly infringed by this Bill. Appeals were to go not to the judges—men above all party strife, and bound by their oaths to administer the law of the land indifferently between party and party—but to the Commissioners of Inland Revenue, or to referees appointed by the Crown—men who hold office at the pleasure of the Crown, subject not only to the law of the land, but also to the orders and instructions of the Treasury. "Having regard," runs the report, "to the numerous and serious questions which will inevitably arise under Part I. of the Bill, the Council consider it of the utmost importance in the interests of the large class of persons affected, that in all cases . . . there should be an appeal from the decision of the Commissioners, and that the tribunal of appeal should not consist of a person appointed by and apparently holding office at the will and pleasure of the Crown, but that all persons whose interests are affected should be able to bring such questions before one of the recognised judicial tribunals of the country. It is obviously objectionable (if not unconstitutional) that the taxing authority or its nominees should become the sole authority to determine the amount of and principle upon which the taxes are to be levied." The second principle—that those who dispute their legal liability should be able to employ skilled legal advice—would probably also have been infringed. It was pointed out in the report that unless special rules were made the parties aggrieved would not be able to be heard by counsel. They would be obliged to appear in person. As the report says, the case for allowing professional assistance in such cases is overwhelmingly strong. "The Crown will be represented before the referee by a highly trained expert in tax law—a surveyor or inspector of taxes—whose business it will be to defend an assessment made by himself. To have upon the other side without legal assistance an appellant who, more often than not, would have no skill in advocacy, and little or no knowledge of tax law, would, in the nature of things, make a proper consideration of the case impossible."

This weighty protest has prevailed. The jurisdiction of the Courts is saved, and parties aggrieved will be able to employ experts to conduct their cases against the experts employed by the Government. But the whole episode should make us reflect upon the character of legislation which has necessitated such a protest. It is not often that the best legal opinion of the day is obliged to rise up and protest against the proposals of a Government. We cannot recall a case since the seventeenth century. And the parallel between the opposition of the legal profession to the Stuart kings and their opposition to the proposals of the present Government is indeed striking. In the earlier period the Stuart kings wished to withdraw cases from the law courts and send them for trial to the Star Chamber, a tribunal which acted on principles different from those of the ordinary law, and composed of members over whom they exercised a strict control. In the later period a Government, which calls itself democratic, wished to oust the law courts from their proper functions and to submit the liability of the property of the subject, under an Act bristling with difficulties, to a non-legal tribunal under the strict control of the Treasury and bound to obey its orders and instructions in applying the law. In the earlier period the Stuart kings feared that the law had too great a respect for the liberty of the subject. In the later period the Government seemed, not unreasonably, to have feared that the law would have too great a respect for their property. *Suum cuique tribuere*, to assign to each his due, is as much an aim of English law as it was of Roman law; and lawyers trained to apply this maxim would doubtless be bad interpreters of this Act.

We cannot doubt but that it is the right and the duty of the House of Lords to weigh carefully the clauses of this Bill in order to see that it does not contain other proposals of a similar nature. Both the House of Commons and the House of Lords are in a sense the guardians of the constitution to which they owe their being. To say that the House of Lords is bound to allow a wholly unconstitutional provision to become law because it is contained in a Finance Act would be an observance of the bare letter of the law wholly opposed to its spirit. Even in matters of private law, adherence to the bare letter of the law to the neglect of principle, and at the cost of producing injustice, is not characteristic of the best judges. In matters of public law it is at least as important that no technical rule should prevent either House of Parliament from resisting

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proposals opposed to the underlying principles of the constitution. *Salus populi suprema lex*; and that the health of the people would be served by uprooting any of the fundamental principles of our constitutional law we have yet to learn.

The House of Lords, therefore, not only has the right, it is even legally bound to examine carefully the clauses of this Bill. Whether after that examination they should pass or amend or reject is a question of mixed law and politics with which we are not here concerned.

REPORT OF THE GENERAL COUNCIL OF THE BAR UPON THE QUESTION OF APPEALS FROM THE COMMISSIONERS UNDER PART I. OF THE FINANCE BILL, 1909.

1. The Council consider that it is in the first instance necessary to state the nature and extent of the questions which by Part I. of the Bill are left to the determination of the Commissioners—that is, the Commissioners of Inland Revenue (s. 74 (3)). It should be remembered that s. 1 of the Inland Revenue Regulation Act, 1890, provides that these Commissioners shall hold office during His Majesty's pleasure, and shall in the exercise of their duty be subject to the authority, direction and control of the Treasury, and shall obey all orders and instructions which have been or may be issued to them in that behalf by the Treasury.

All the taxes or duties imposed by Part I. are based on the values, or increase in values, of land (which term includes minerals) or interests in land. These values have to be determined by valuations, most of which are necessarily elaborate, and to a large extent of a novel character. It follows that the amount to be levied in respect of these taxes depends in every case on the valuations.

The effect of the Bill is to leave the determination of all these valuations (including many subsidiary matters on which the valuations depend) to the Commissioners. The powers given by the Bill to the Commissioners in regard to making valuations, and the consequent assessment of duty, may be summarised as follows:—

A. *As to Increment Value Duty.*

By ss. 1 and 2, this is a duty of 20 per cent. on the amount by which the "site value" of the land at the time when the duty is leviable exceeds the "original site value."

By ss. 1, 2 and 15, a similar duty is imposed on the amount by which the "capital value" of any minerals at the time when the duty is leviable exceeds the "original capital value" of such minerals.

The Commissioners are empowered:—

(*a*) To determine and if necessary apportion the "original site value" (ss. 16, 17 and s. 2 (3)).

(*b*) To determine the "site value" at the time when the duty is leviable (s. 2 (2) and (3) and s. 21).

(*c*) To determine the "original capital value of the minerals" (ss. 15, 16, 17 and 18).

(*d*) To determine the "capital value" of the minerals at the time the duty is leviable (s. 18).

(*e*) To decide what are minerals, and whether they exist in any particular case. This is involved in (*c*), (*d*) and (*f*).

(*f*) To decide the amount of the duty payable and the allowances to be made having regard to the amount of duty paid on previous occasions (s. 3 and s. 8 (4)); and

(*g*) To decide on what pieces of land the duty is to be assessed (s. 19).

B. *As to Reversion Duty.*

By s. 7, this is a duty of 10 per cent. on "the value of the benefit accruing to the lessor by reason of the determination of a lease."

The Commissioners are empowered:—

(*a*) To decide what is the value of this benefit (s. 9).

(*b*) To assess the duty (s. 9).

(*c*) To decide what allowance (if any) should be made on account of a previous payment of increment value duty (s. 8 (4)).

C. *As to Undeveloped Land Duty.*

By s. 10 this is an annual percentage on the "site value" as determined at periodical intervals of five years (s. 18).

The Commissioners are empowered:—

(*a*) To determine the "site value" from time to time (s. 18).

(*b*) To assess the duty (s. 13).

(*c*) To decide whether or not the land is "undeveloped land." This appears to follow from (*a*) and (*b*).

(*d*) To decide what exemptions and allowances should be made from the duty (s. 11).

(*e*) To decide on what pieces of land the duty is to be assessed (s. 19).

D. *As to Mineral Rights Duty.*

By s. 12, this is an annual percentage on the "capital value" of the minerals as determined at periodical intervals of five years (s. 18).

The Commissioners are empowered:—

(*a*) To determine the "capital value" of the minerals (ss. 15, 16, 17 and 18).

(*b*) To assess the duty (ss. 13 and 19).

(*c*) To decide what are minerals and whether they exist in any particular case. This is involved in (*a*) and (*b*).

2. There is no provision in the Bill entitling the person interested in the decision of the Commissioners to appear before such Commissioners, either in person, or by counsel, or by solicitors.

3. In the next place it is necessary to consider in what cases and to what tribunal an appeal lies.

In certain cases (mentioned later) the decision of the Commissioners is final.

In those cases in which an appeal is allowed the only appeal given by the Bill as drafted (as will be seen from the statement of the provisions of ss. 22 and 23 hereinafter contained) is to a Referee who is to be an official appointed by the Government of the day, and paid such remuneration as the Treasury direct.

The jurisdiction of the Courts is ousted for all purposes except in such cases as the Referee may think fit to state a case upon a question of law for the opinion of the Court.

Although many important questions of principle will doubtless arise in the course of determining the proper values under the Bill, it is at least doubtful whether such questions can, strictly speaking, be said to be questions of law within the meaning of s. 22 (3).

4. On the following matters the decision of the Commissioners is final, and no appeal lies:—

(*a*) The character of parks, gardens and open spaces, and of athletic grounds for purposes of exemption from undeveloped land duty (s. 11 (3)).

(*b*) The reasonableness of legal restraints by covenant upon the user of land affecting total value and site value (s. 14 (3)).

(*c*) Total or site value of land where the owner has made no return (s. 22 (1) (A)).

5. By s. 22 of the Bill it is proposed to enact:—

(*a*) That any person aggrieved may appeal against the decision of the Commissioners as to matters in which an appeal lies within such time and in such matters as may be provided by rules made for the purpose by the Treasury (s. 22 (1)).

(*b*) That the appeal is to be heard by a Special Referee whose decision is to be final (s. 22 (2)).

(*c*) That such Referee may, if he thinks fit, state a case upon any question of law (s. 22 (3)).

And by s. 23 it is proposed to enact:—

(*d*) That the King may appoint any person having experience in the valuation of land to act as Referee.

(*e*) That there shall be paid out of moneys provided by Parliament to every Referee appointed under this section such fees or remuneration as the Treasury direct.

6. There is no provision in the Bill entitling an appellant against the decision of the Commissioners to appear before the Referee, either in person, or by counsel, or by solicitors.

7. The statements contained in paragraph 1 of this report sufficiently indicate the nature of the questions which the Commissioners, or in case of appeal the Referee, will have to decide, and the Council do not consider it necessary in this report to dwell upon the great importance of such questions to landowners and mortgagees, as this has already been widely and publicly discussed in the House of Commons and elsewhere.

8. Having regard to the numerous and serious questions which will inevitably arise under Part I. of the Bill, the Council consider it of the utmost importance in the interests of the large class of persons affected that in all cases (including the cases enumerated in paragraph 4 of this report) there should be an appeal from the decision of the Commissioners, and that the tribunal of appeal should not consist of a person appointed by and apparently holding office at the will and pleasure of the Crown, but that all persons whose interests are affected should be able to bring such questions before one of the recognised judicial tribunals of the country. It is obviously objectionable (if not unconstitutional), that the taxing authority or its nominees should become the sole authority to determine the amount of and

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principle upon which the taxes are to be levied. The Council consider that it is altogether wrong that the powers of appealing to the High Court and County Court afforded by s. 50 of the Succession Duty Act, 1853, imported into the Customs and Inland Revenue Act, 1885, should be excluded, as proposed by s. 6 (3) and s. 9 (4) of the Bill.

9. Should, however, the constitution of the tribunal of appeal remain as suggested, the Council consider it essential in the interests of the persons affected that every person interested should have the right to appear before the Commissioners and before the tribunal of appeal, and be heard before such tribunal and in the same manner as in a Court of Justice.

10. It will be observed (*vide* s. 22) that it is proposed that the manner and time in which appeals are to be heard are to be regulated by rules framed by the Treasury. It is unlikely that when such rules are promulgated they will be found to contain any provision for allowing professional assistance to appellants. The question of such assistance has, in the case of taxes such as the income tax and land tax, been expressly dealt with by statute. The assistance of a legal adviser is apparently allowed in the case of an appeal against an assessment to land tax. In the case of income tax (which includes for this purpose house tax) the position is different. The Taxes Management Act, 1880, enacted that "no barrister, solicitor, or attorney, or any person practising the law, shall be allowed to plead before the General Commissioners" (corresponding to the new Referee) "on appeal for the appellant or officers, either *viva voce* or by writing." The Finance Act, 1898, takes away this prohibition, making it lawful for the Commissioners to allow professional assistance to appellants, but giving appellants no right to insist on being represented. The Revenue Act, 1903, enacts that in any case where the General Commissioners refuse to permit a barrister or solicitor to plead before them, the appellant may, in lieu of proceeding with the appeal before the General Commissioners, appeal to a special income tax tribunal, which is enjoined by the Act to hear appellant by his counsel or solicitor. The tribunal would, of course, not be available in the case of appeals against assessments to the new taxes. And in the absence of express provisions on the subject by statute or statutory rules, the Referee would, it is conceived, in matters coming before him adopt the traditional rule of the Civil Service and give audience only to the appellant in person, although prepared to correspond as to any matters within his province with the agents of persons concerned. Putting aside altogether the question of professional interest, the case for insuring that an appellant shall be at liberty to have professional assistance in the Court of the Referee is overwhelmingly strong. The Crown will be represented before the Referee by a highly trained expert in tax law—a Surveyor or Inspector of Taxes—whose business it will be to defend an assessment made by himself. To have upon the other side without legal assistance an appellant who, more often than not, would have no skill in advocacy, and little or no knowledge of tax law, would, in the nature of things, make a proper consideration of the case impossible.

11. Should none of the above suggestions be accepted the Council consider that at least the Commissioners and Referee should be given power to permit a barrister or solicitor to plead before them either for the appellant or the officers of the Crown, as was provided in s. 16 of the Finance Act, 1898, repealing s. 57 (9) of the Taxes Management Act, 1880.

12. Further, as the Referee will have to consider and determine serious and difficult questions as to the principle upon which land is to be valued, the Council consider that in any case the Referee should be bound upon the request of any person interested to state a case upon any such question for the determination thereof by the High Court, or in cases where the amount concerned is small by the County Court.

For the above reasons the Council are of opinion that the Bill ought to be amended in the following respects:—

(*a*) By removing the restrictions as to the right to appeal contained in Sections 11 (3), 14 (3), and 22 (1) (*a*), and by giving an express right of appeal in the cases dealt with by such sections.

(*b*) By providing that in every case there shall be an appeal from the decisions of the Commissioners under Part I. of the Bill, and that such appeal shall be to the High Court, or in cases where the amount concerned is small to the County Court, instead of to a Referee.

(*c*) If the provision for appeal to a Referee should remain in the Bill, by inserting a provision in the Bill that every person interested should be entitled as of right to be heard before such Referee in the same manner as in a Court of Justice.

(*d*) If the last-mentioned provision should not be accepted, that power should be given both to the Commissioners and to the Referee to permit a barrister or solicitor to plead before them.

(*e*) If appeals are to be heard by a Referee, that such Referee should be bound to state a case upon any question of law or principle arising during the course of the reference, if desired to do so by any party appearing before him.

THE SETTLEMENT OF THE SAXONS.*

ARYAN, the term to denote the Indo-Germanic or Indo-European family, was first used by Professor Max Müller. The ancient district of Ariana, which became a Persian province, was captured by Alexander the Great, and the city he built is supposed to be represented by the later Herat, and in and about Ariana the cradle of the Aryan races was variously placed; but Dr. R. G. Latham in 1851, and later Theodor Benfry, advanced a theory that the races originated in Western Europe. In 1862, when Henry Christy and Edouard Lartet explored the caverns of the Dordogne in South-West France, they discovered crude engravings on the bones and tusks of extinct animals which are regarded as having been made by man when contemporary with the mammoth, and the new theory was accepted by the greatest scholars. But whether it was from Central Asia or Western Europe that the pioneers came to Britain, it is very probable that the chief hymns in the Sanskrit "Rig Veda," addressed to the god of storms and the god of light, may denote the early religion of the Celts, though the gods then had not been personified as Indra and Agni. Later, as we know, the Celts evolved or adapted a more elaborate theogony.

Natural phenomena was probably the origin of all primitive religion; the sun, the moon, the fruitful earth, lightning, thunder, hurricanes, rushing rivers and bursting springs must ever have excited reverence or awe. The oldest religion of Peru tells how Viracocha rose from the water, and having created the sun, moon and stars, he carved statues out of stone and gave them life; and Ovid tells how Deucalion and his wife Pyrrha were saved at the Deluge in a little ship and how they cast stones behind them, which gradually vivified and so the earth was repeopled. But the worship of stones and rocks seems to have originated with the falling of belemnites, or meteoric stones, and at Ephesus, Artemis was worshipped as the stone which fell from heaven. The stone was introduced into Anglo-Saxon names, like Æthelstan, noble stone; Dunstan, high stone; Ælfstan, elf stone; and Wulfstan, wolf stone. In the charters special stones and trees are mentioned as boundary marks, and the gemots or folk moots were held by sacred stones and trees.

In the Babylonian Talmud trees and stones are mentioned among the objects of false worship; but apart from "The Tree of Life" and "The Tree of Knowledge of Good and Evil" it is difficult to determine how the worship of trees originated. In the earliest collection of fables extant, the Sanskrit Hitopadesa, the Kalpa-tura, or Tree of Thought, is introduced; in the Sanskrit Mahabharata we read of a region which Arjura traversed where men and women grew on trees; in the Sanskrit Sakuntalà the trees in Canna's sacred grove have the gift of speech; and folk tales of talking trees seem common to all countries. Herodotus records that the first shrine in Greece was at Dodona. A black pigeon flew there from Thebes, in Egypt, and, settling on an oak tree, commanded that an oracle should be there erected to Zeus; charms were hung on the branches, and the murmur of the wind among the leaves was regarded as the voice of heaven answering the prayers of the supplicants. The Scandinavians and Saxons, as we know, claimed descent from the sacred ash tree, and in Britain they had their hallowed ash groves, as the Druids had their sacred groves of the oak.

The Welsh Triads are supposed to be the remains of the Druidic mnemonic system. Their pupils were instructed orally, and the Triads were handed down by word of mouth and finally committed to writing, and at the close of the eighteenth century were translated by Owen Jones. From the Triads we learn that the first man who set foot on Britain was Hu Gadarn, or Hu the Mighty; the island

* Read at a meeting of the Upper Norwood Athenæum by W. F. Harradence.

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was then called Clâs Merddin, or the green spot defended by water; later it was known as Fêl Ynis, or the Island of Honey; and when Prydain ap Aedd Maur, or son of Ædd the Great, came from Armorica and obtained the government it was renamed Inis Prydain, from which, we are told, we get the Isle of Britain.

The chronicle of Nennius may date from the eighth century; in the tenth it was edited by Mark the Anchorite, and there the story of the coming of the Græco-Romano Brut, or Brutus, is given, which in the twelfth century was recounted by Geoffrey of Monmouth; but Nennius also gives another story, and records that the first man who dwelt in Europe was Alanus. One of his sons was Hisicion, whose son Brutus gave his name to Britain and peopled it with his descendants. Another son of Alanus was Neugio, whose son Saxo founded the Saxons. Some prosaic writers, however, consider that the name Britain was derived from the Brythons of Armorica, while others associate it with the Phœnician or Hebrew Baratanæ, signifying the land of tin; and though Ralph Higden, in his "Polychronicon," derives Saxon from Saxum, a stone, most writers trace the name to Saex, a knife or sword, for the Saxons were a nation of swordsmen.

Pytheas, a Greek physician, who came to Britain 300 B.C. or earlier as some writers compute, described the island as of a three-cornered shape, and Julius Cæsar, who made his memorable visit 55 B.C., also termed it triangular, so even then it may have been spoken of as the angle land. Sir Francis Palgrave and other writers conjecture that prior to the landing of Cæsar the Saxons had made incursions and had formed settlements on the south coast, but though they doubtlessly felt a superstitious terror when the blows of Thunor's hammer were heard in the storms, it is not probable that any shrines to the Teutonic gods had then been erected. With the coming of the Romans altars and temples were reared to the chief gods of the Pantheon. Whether St. Paul preached at Silchester, whether Claudia lived at Kingsbury in Middlesex, whether St. Joseph of Arimathea built a church at Glastonbury, and whether King Lucius founded the first cathedral we need not discuss, but it is quite certain there were Christian churches and bishops in Britain from very early times, and the Emperor Theodosius, who was baptized in 380, established Christianity as the religion of the State.

Gradually the Romans constructed their great partition walls and built their castrums, and various officers were appointed, including the Comas Littoris Saxonici par Britannias, or Count of the Saxon Shore. From Bæda we learn in the year 287 Diocletian and his colleague, Maximian Herculius, appointed Carausius, an able soldier of low birth, to guard the coasts, then infested by Franks and Saxons; Carausius, however, made himself master of Britain, assumed the title of emperor, and held his position for seven years until he was assassinated by his associate Allectus. In 364 the Picts, Scots and Attacotti united their forces, and they were joined by some Saxon pirates, who attacked the south coast, and Nectaridus, Count of the Saxon Shore, was slain. In the Notitia Utriusque Imperii, a MS. assigned to the time of Theodosius, who was made emperor in 379, it is stated that the stations under the command of the Count of the Saxon Shore were Othonæ (Bradwell, or, as some think, Felixstowe), Portus Dubris (Dover), Portus Lemanus (Lymne), Branodunum (Brancaster), Garianonum (Burgh Castle), Regulbium (Reculver), Rutupiæ (Richborough), Anderida (Pevensey), and Portus Adurni (Aldrington).

With the withdrawal of the Roman forces in 412 the raids of the Picts and Scots and the incursions of the Saxons became more frequent, and eventually, Fabius Ethelwerd says:—"Vurthern (Vortigern), then king over all, sent messengers with gifts to Germany, asking for assistance and promising help in return." But according to Geoffrey of Monmouth, who gives the most romantic account, the brothers Hengist and Horsa came uninvited. Vortigern was at Dorobernia (Canterbury) in 449, and being informed that some tall strangers had arrived in three brigantines, he ordered that they were to be received peacefully and brought to him; and Hengist stated they were seeking their fortunes, and by the good guidance of Woden they had reached his land and were willing to serve him; and Hengist told of the gods to whom they had dedicated the days of the week.

Wodensesdæg is from Woden the all-father; he delighted in battle, and only admitted to Wælheal those who died sword in hand. John Mitchell Kemble traces his name in Wanborough and Wonersh, Surrey; Wanborough, Wiltshire; Woodnesborough, Kent; Wonston and Wanborough, Hampshire; Wambrook, Dorsetshire; Wampool, Cumberland; Wansford, Northamptonshire; Wansford, Yorkshire; Wanstead, Essex; Wanstrow, Somerset; and Wembury, Devonshire. Frigedæg is from Friga, the earth goddess and wife of Woden; and her name survives in Frathorpe and Fridaythorpe, Yorkshire; Freasley, Warwickshire; and the Friday Streets in Surrey and Suffolk. Thunersdæg is from Thunor, the most valiant of Woden's sons; he was the defender and avenger of the gods, and is associated with Thundersfield and Thursley, Surrey; Thundersley and Thurlow, Essex; Thurley, Bedfordshire; Thursley, Cumberland; Thursfield, Staffordshire; Thursford, Norfolk; and Thundersley, Hampshire. Tiwesdæg is from Tiw, the protector of champions and brave men, and his name was given to Tuesley, Surrey, and Tewing, Hertfordshire; and Isaac Taylor adds Great Tew and Tew-dunce, Oxfordshire, and Dewerstone, Devonshire. Sæterdæg is from Sætare, the god of agriculture; Satterleigh, Devonshire, and Satterthwaite, Lancashire, preserve his name. Sunnandæg is from Sunne, the sun, only represented by Sonning, in Berkshire; and Monandæg is from Mona, the moon. Several other place-names derived from the gods are regarded as representing the later settlements of the Danes.

Vortigern engaged the strong strangers, who soon showed their prowess by defeating the Picts who had issued from Albania. Hengist sent for other warriors, and with them came his beautiful daughter Rowena. Having been allowed to erect Tong Castle, in Kent, or, as some say, Thong Castle, Lincoln, he invited Vortigern to a feast, and Rowena offered him a golden cup of wine, saying "Wacht heil" (be whole or healthy), and the King, being instructed, replied, "Drinc heil" (drink health), and so the fashion of drinking healths was established in Britain, and her words survived in the wassail bowl. Vortigern at once made the maiden his wife, possibly according to the Saxon usage, which consisted in the bridegroom touching the lady's neck with a shoe, a variation of the custom of placing the foot on the neck of a conquered foe, and faintly echoed in throwing a satin slipper after the bridal coach. In exchange for the lady the province of Kent was given to Hengist, and his sons received the northern part of Britain. Fresh arrivals of the Saxons continually took place, to the fear of the Britons, who, with Vortimer, the son of the king, as their leader, waged war on the Saxons, and in the A. S. Chronicle under date 455 we read:—"This year Hengist and Horsa fought against King Vortigern at the place which is called Ægels-thræp (Aylesford), and his brother Horsa was there slain, and Hengist obtained the kingdom and Æsc his son." The name of Hengist is supposed to survive in Hengston Hill, Cornwall; Hengistbury Head, Hampshire; Hinksey, Oxfordshire; and Henstridge, Somersetshire; and William Camden states that the mound bearing his name, by Conisborough Castle, Yorkshire, is his tomb. Horsa is associated with Horsham and Horsted, Sussex, and Horsted, Kent, where his grave mound is shown; and Taylor connects Horstead, Horsham and Horsey, Norfolk, and Horsell in Sussex with some one of the name of Horsa.

(To be concluded.)

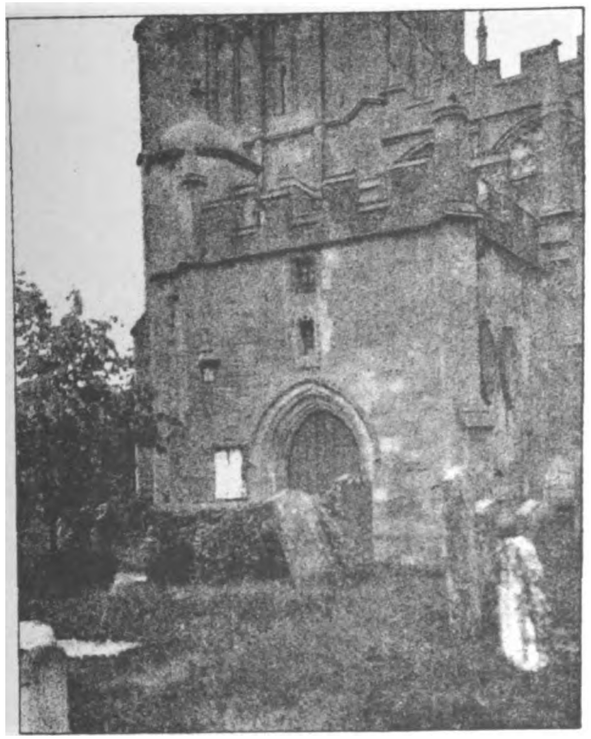
ILLUSTRATIONS.

ARCHITECTURAL ASSOCIATION EXCURSION 1909.

THE whole of our plates this week are in illustration of places visited by the Architectural Association on the annual excursion this year, of which an account has been given in our last two issues. These plates were prepared from photographs taken by Mr. A. W. HENNINGS, and show the characteristic and typical architecture of the Cotswold district.

The Excavations at the Roman Amphitheatre at Dorchester will be renewed on August 30, under the direction of Mr. H. St. George Gray. Last year much attention was given to the eastern side of the entrance into the arena, when a series of puzzling post-holes, small pits, and trenches were revealed in the solid chalk. In the hope of solving their purpose by finding others, excavations will now be carried out on the western side of the entrance up to the solid chalk wall of the arena.

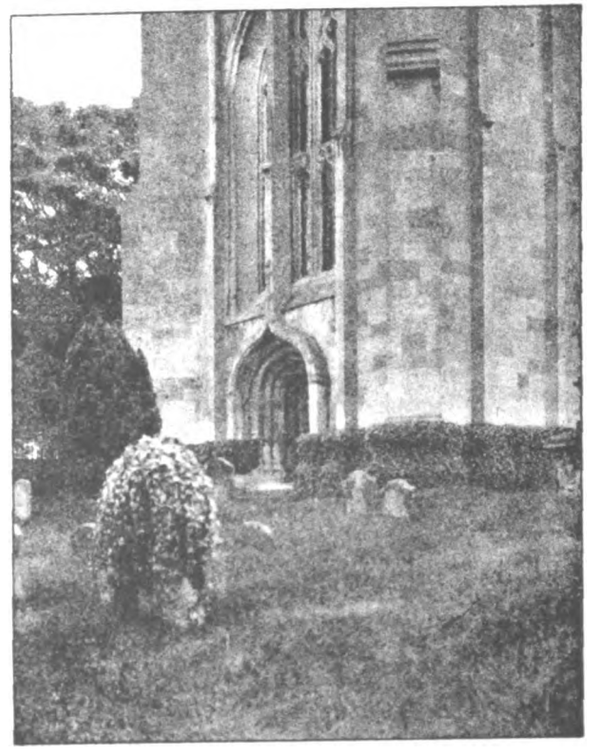
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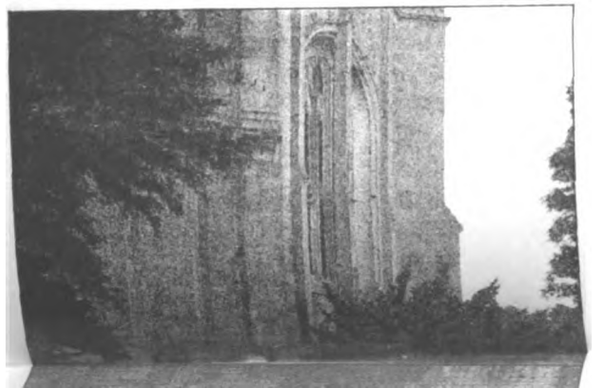
Chipping Campden Church South Porch



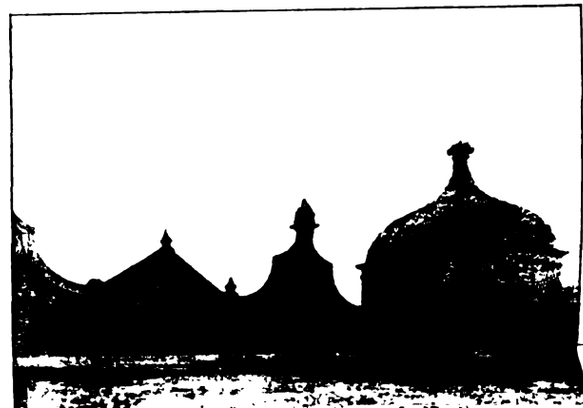
Chipping Campden Church East End



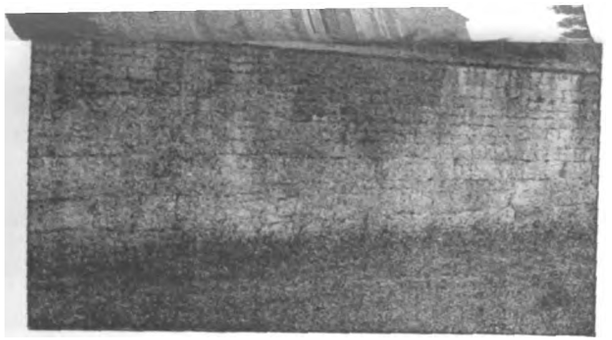
Chipping Campden Church West Window







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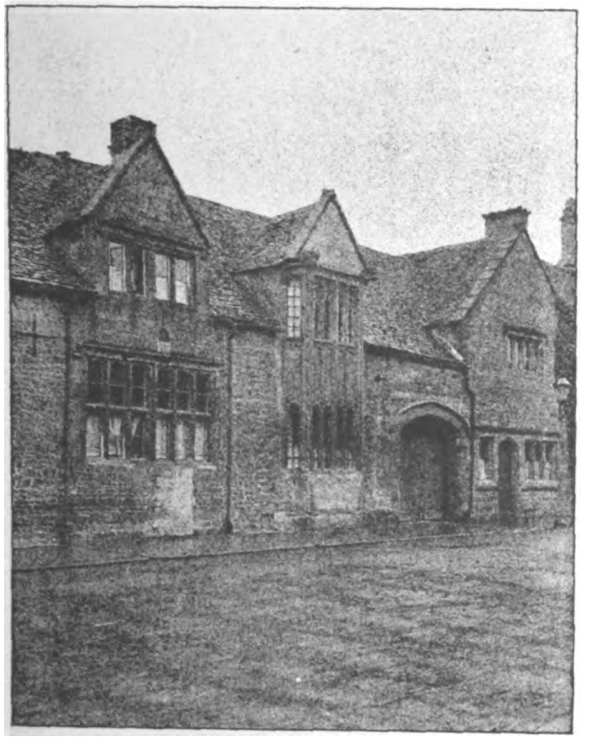
Chipping Campden Church West Window



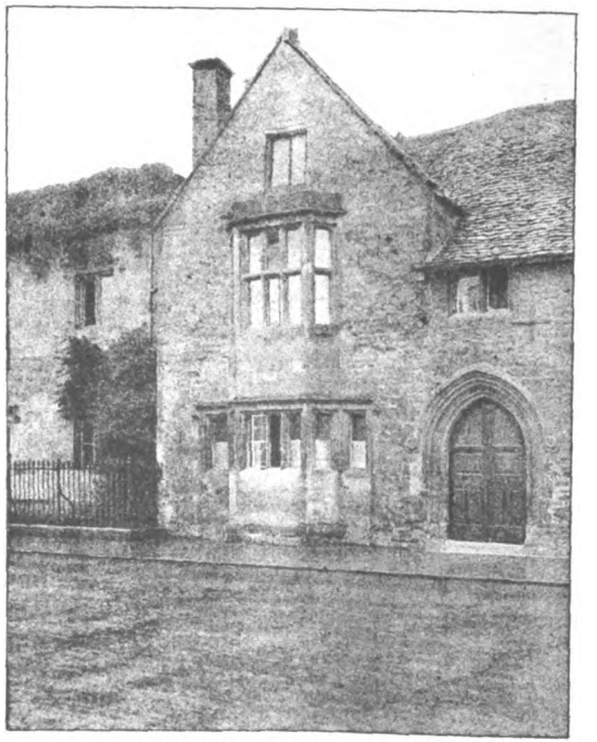
Chipping Campden Street & Tower



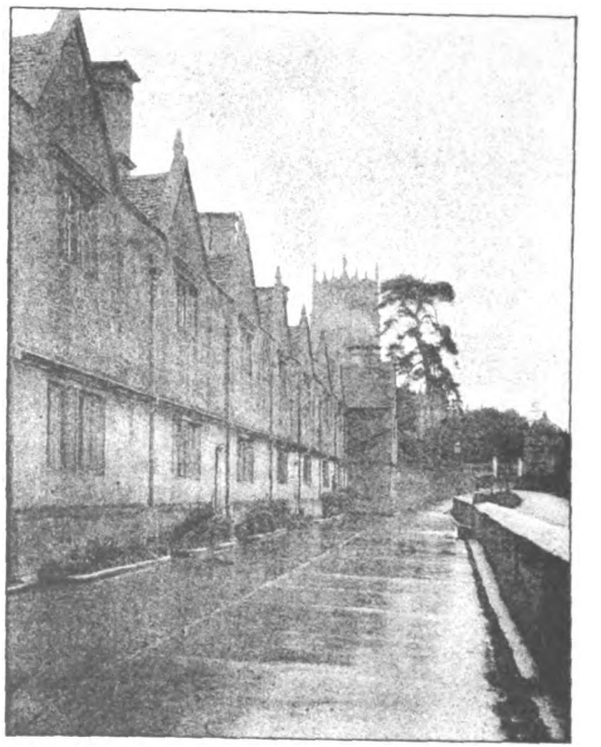
Chipping Campden Gateway



Chipping Campden Street



Chipping Campden Street



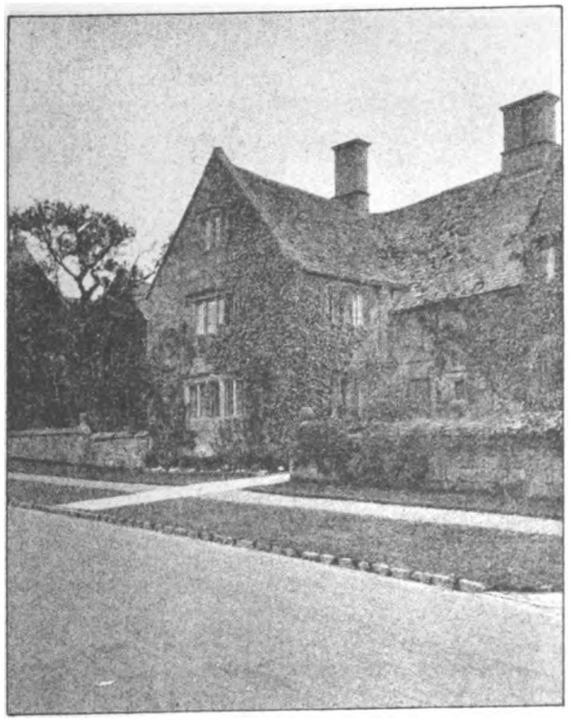
Chipping Campden Terrace Almshouses

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Broadway, Mary Anderson Home



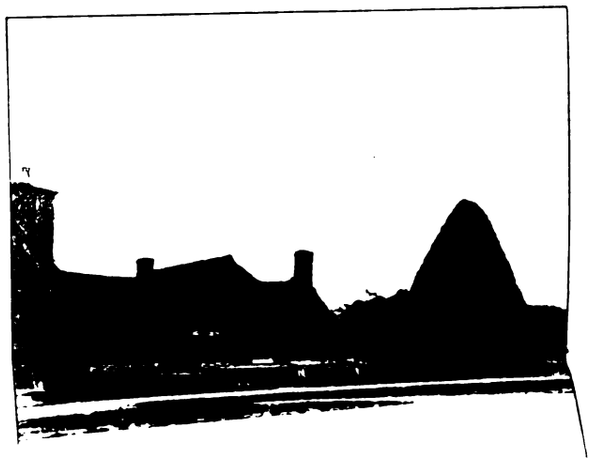
Broadway, Upper Farm



Broadway, Upper Farm Door



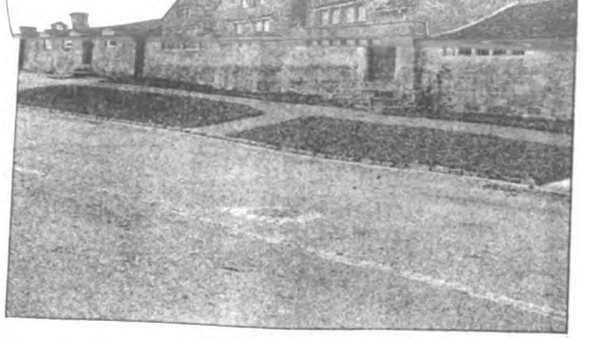




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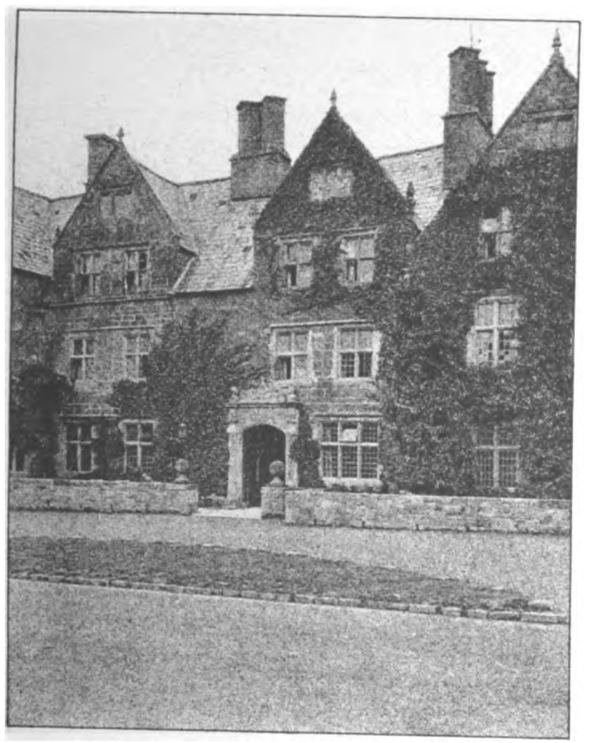
Broadway, Garden House



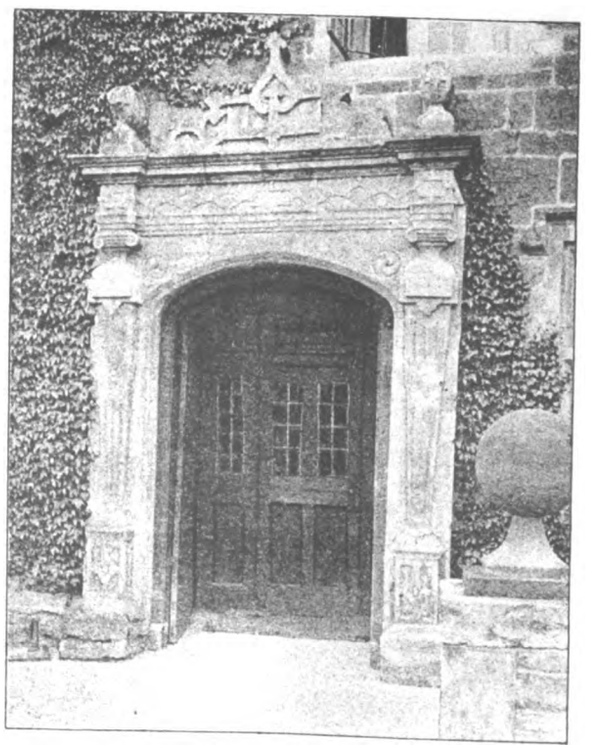
Broadway, Gabled House



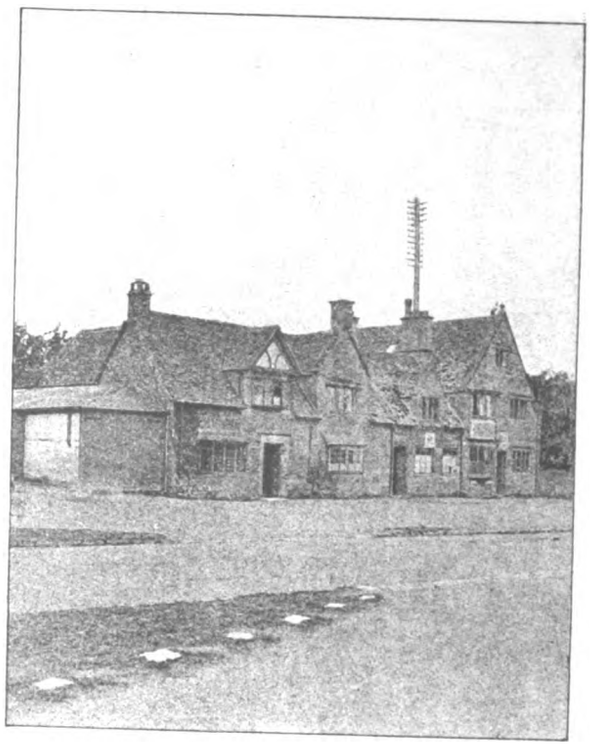
Broadway, Yew-Tree Cottage



Broadway, Lygon Arms



Broadway, Lygon Arms, Door



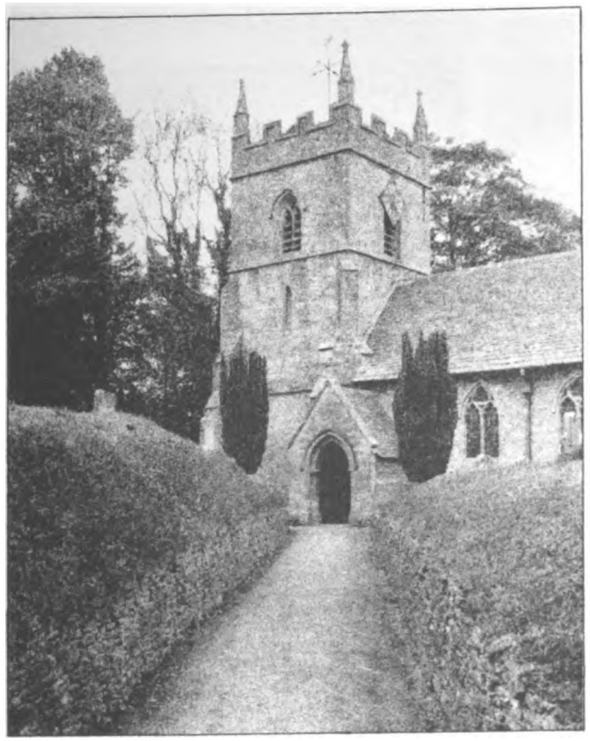
Broadway, Post Office

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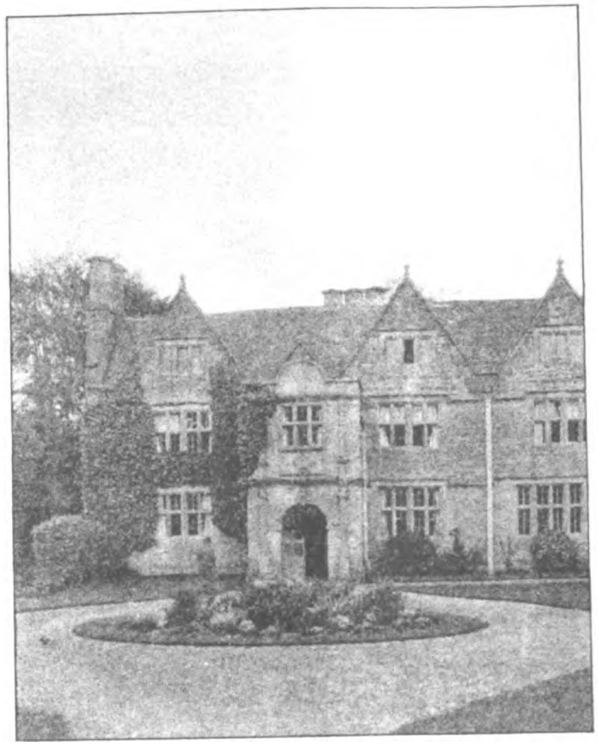
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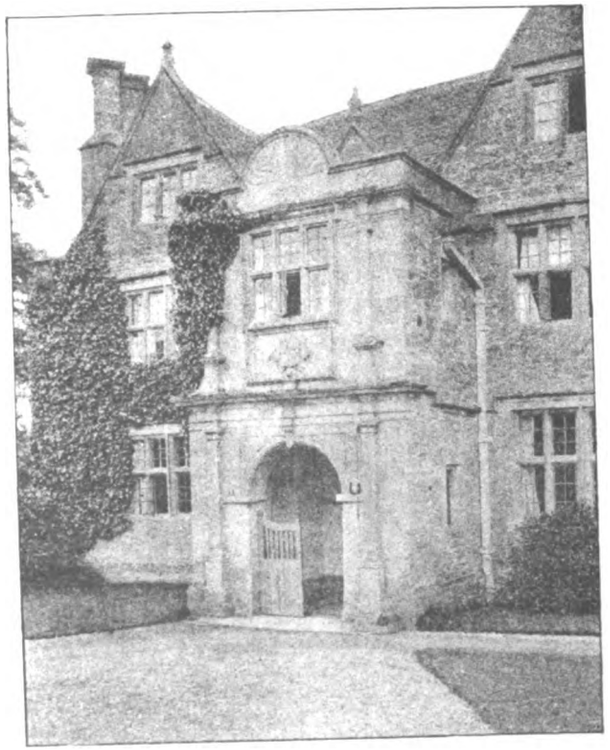
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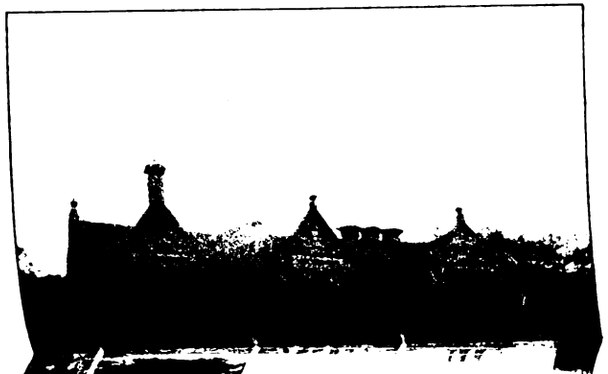
Upper Slaughter. Church



Upper Slaughter. Manor House



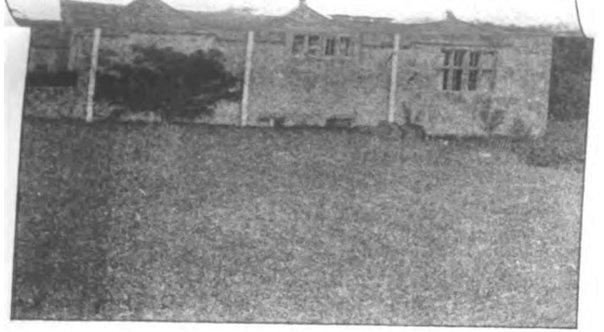
Upper Slaughter. Manor House







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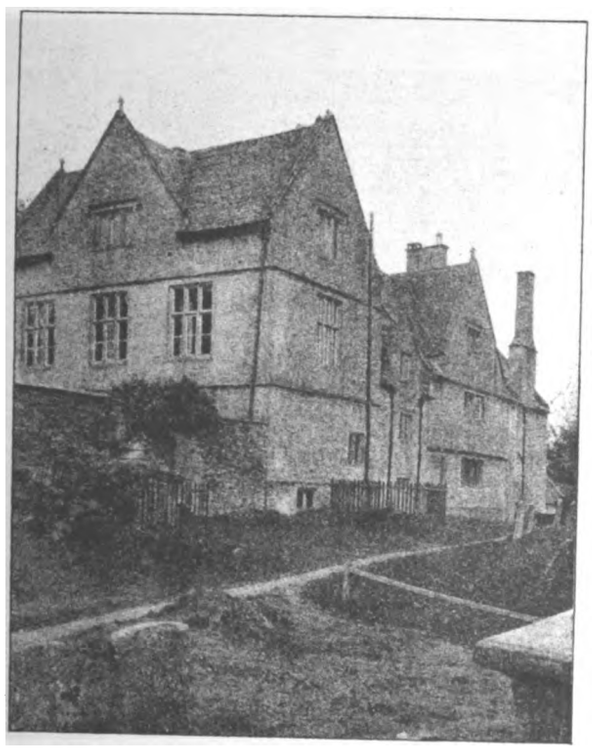
Upper Slaughter. Manor House



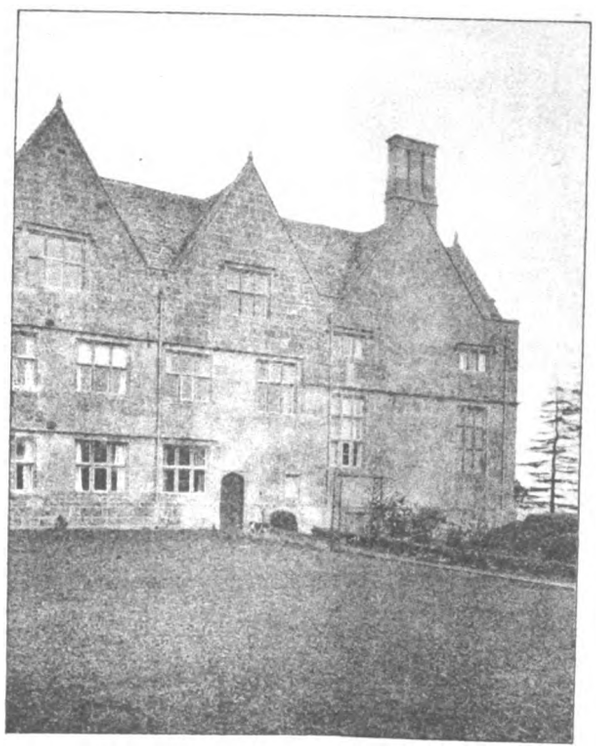
Upper Slaughter. Manor House



Sevenhampton Church.



Sevenhampton Manor



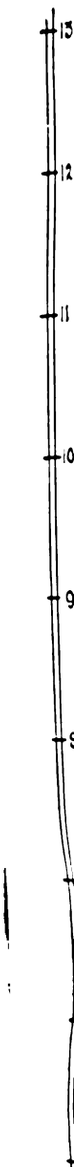
Charlton Abbots House.



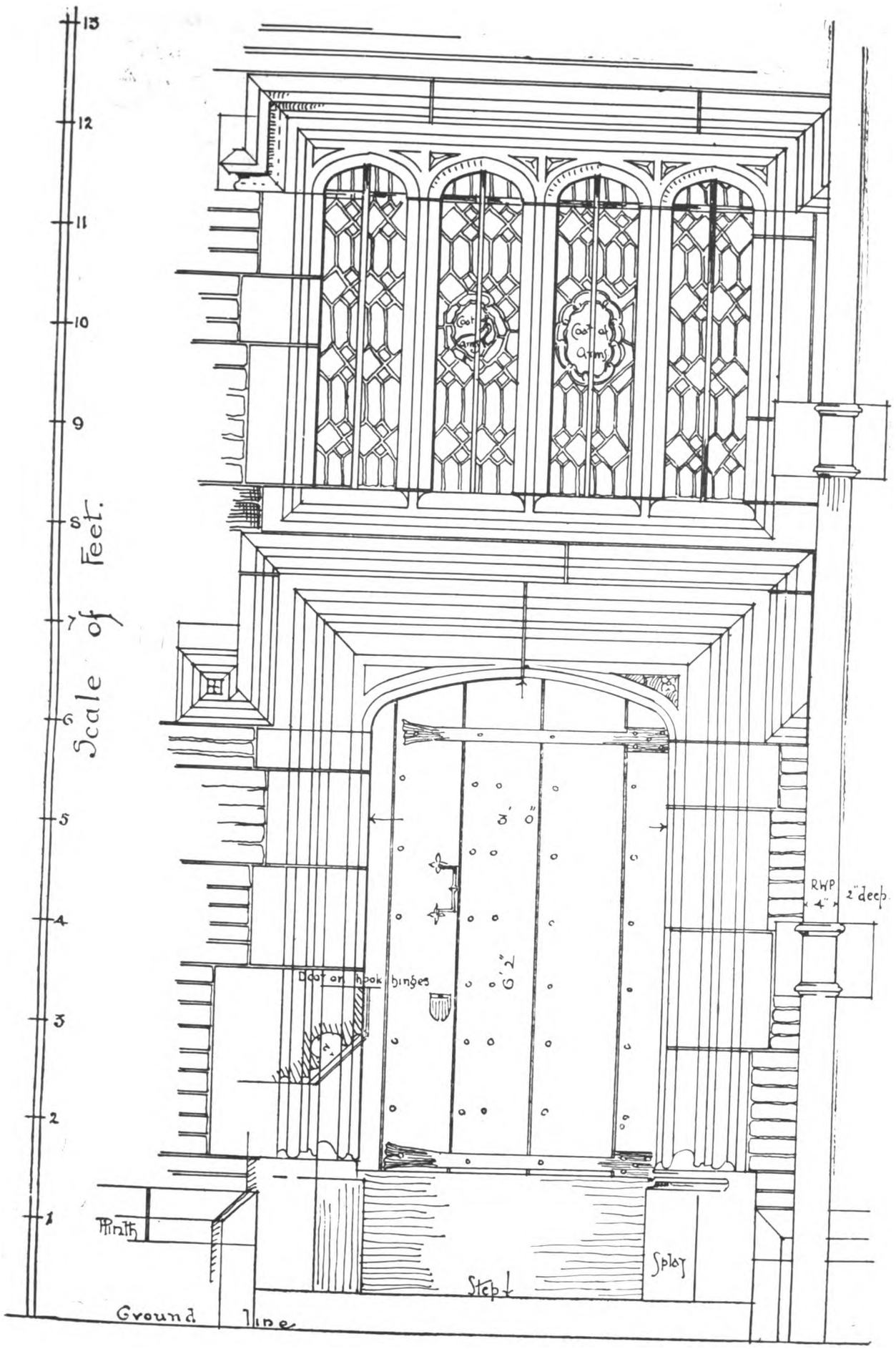
Charlton Abbots House.

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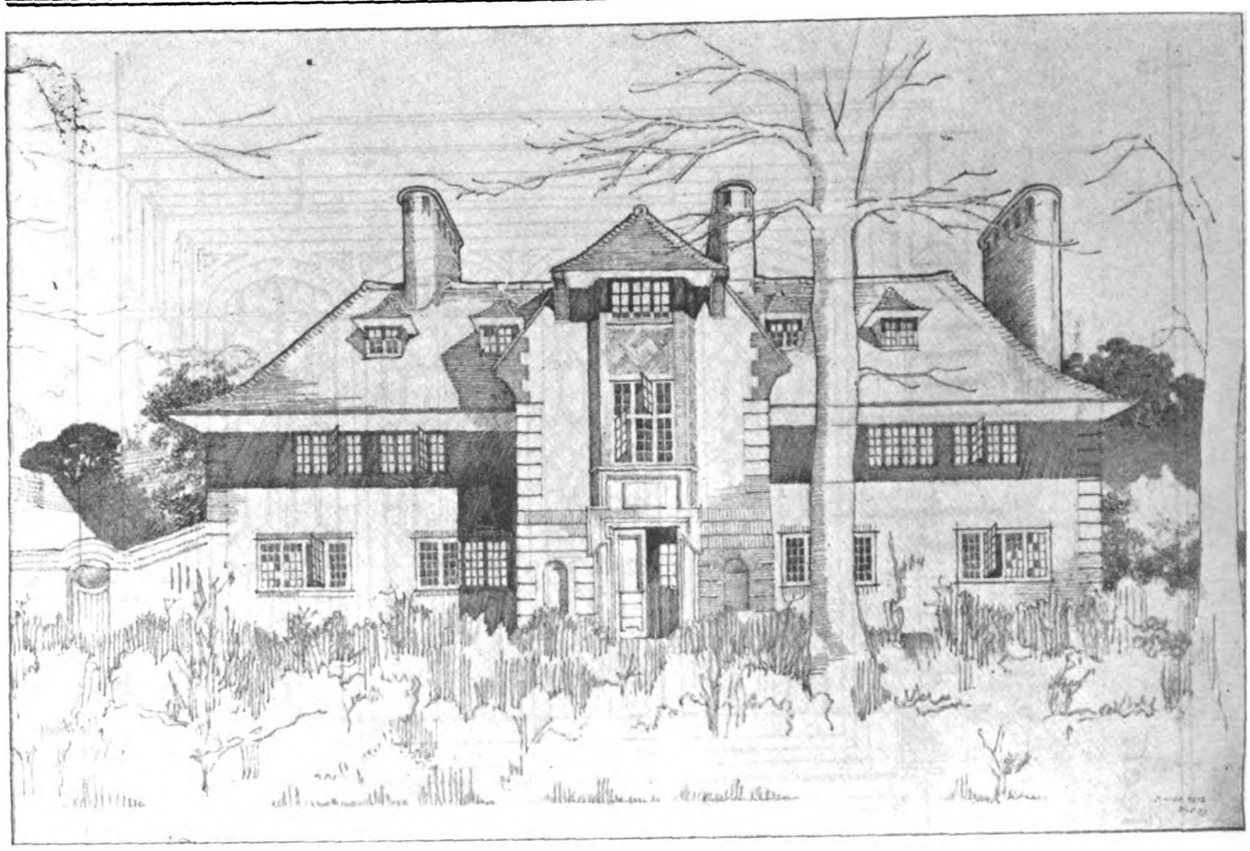
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COMPTON WYNYATES, WARWICKSHIRE.—DOORWAY IN COURTYARD, SOUTH SIDE.

By Banister Fletcher.

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HOUSE AT NORTHWOOD, MIDDLESEX, FOR J. R. WUIDART, ESQ.—Forbes & Tate, Architects.

HOUSE AT NORTHWOOD.

THIS house is built in red brick and roofed with special thick hand-made sand-faced tiles. The interior is finished throughout with American elm. The accommodation consists of four public rooms, eight bedrooms, two bathrooms, and ample cloakroom, linen cupboard, and wardrobe rooms. The builder is Mr. W. King, Watford; Messrs. Forbes & Tate the architects.

THE ARCHITECTURE OF FLEET STREET.

By Lewes M'Jabols.

WE were seated in my chambers in King's Bench Walk, holding pleasant and profitable converse, and it chanced that I made mention of the rare delights of London. "Sir," said my venerable companion, James Noonlush, "London is the hub of the world, and Fleet Street is the hub of London; let us perambulate Fleet Street."

A walk with Dr. Noonlush was always, in my estimation, exhilarating, and in the present instance I anticipated a continuance of the pleasure and profit which I had just been experiencing should my venerable friend and his humble disciple take a tour among the realms of the Fourth Estate. I ventured, half apologetically, to submit this *tour-de-phrase* to the worthy Doctor's criticism, and I was sensibly relieved when he was benignantly pleased to stamp it with the hall-mark of his approbation.

We wended our way into New Bridge Street, and were at once assailed by the roar of the ceaseless traffic. I had to strain every nerve (or, in my desire for extreme accuracy, let me say "every aural nerve") to catch the gems of thought so forcibly expressed by my friend; even now that is very imperfect, very weak—how unlike to my friend's expressions, which are always of the strongest and most vigorous type.

I was immediately seized with a desire to ask my companion what were his views on the modern development of architecture. "Sir," said he, "there is not much evidence of development, for this word implies a rational modification of the art as practised at any time to suit the conditions and tastes of the time just consequent. Now, Sir, I defy anyone to prove any such logical sequence in the work of our architects."

M'Jabols: "But, Sir, can you not conceive entirely new conditions arising at some particular period for which no precedent architecture would prove satisfactory?"

Dr. Noonlush (*with a triumphant smile*): "In that case, Sir, it would not be a matter of development."

I was struck by the brilliancy of the retort, and said no more on the point. By this time we had reached Ludgate Circus, and straightway turned down Fleet Street.

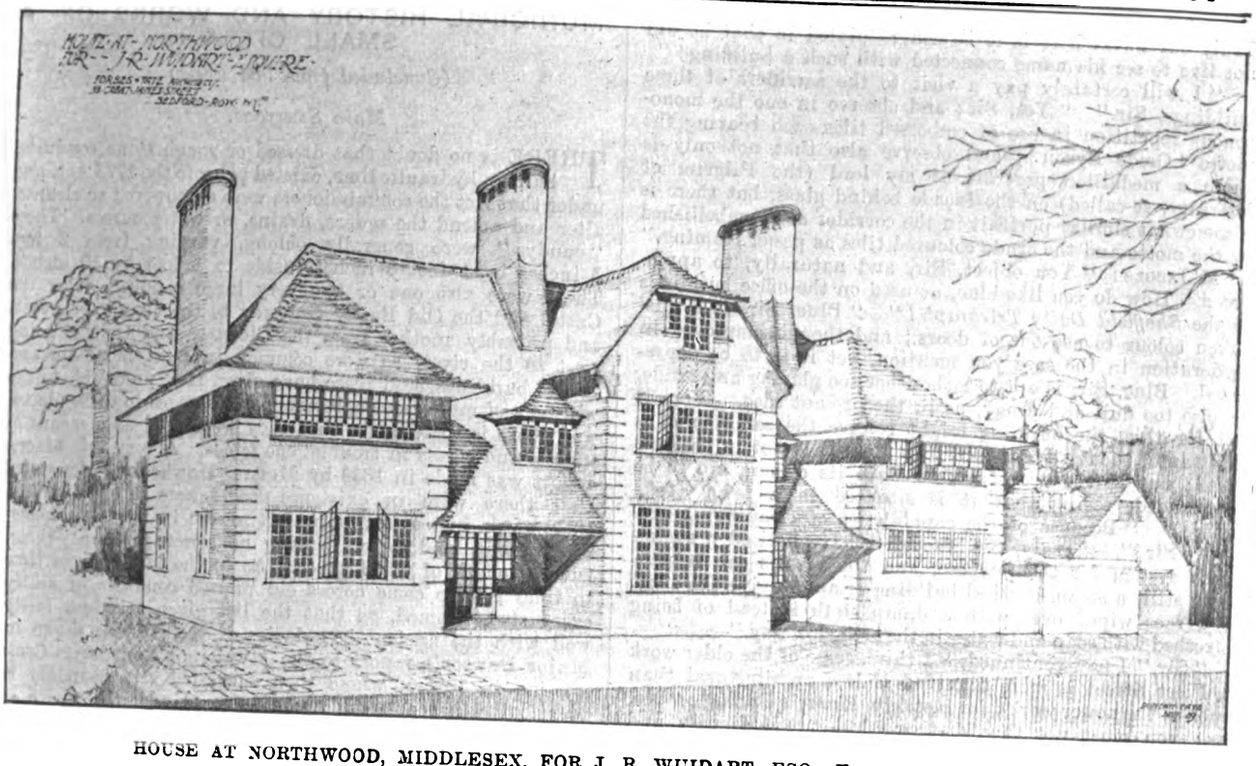
"Observe, Macky," said Dr. Noonlush, "that new building opposite us, where those respectable globe-perambulator agents are providing an extension of their offices. You talk of development. Well, Sir, I have nought to say against the frontage in its entirety; but observe that pernicious conjunction of curly gable seated on a broken pediment. Architects may say that there is not any law against such conjunction; but yet, Sir, it is surely a retrogression, not a development."

I was somewhat surprised at my worthy friend's choler, but I durst not show it. "Perhaps, Sir, it is an instance of 'Reculer, pour mieux sauter'; but, in any case, I cannot but think that the building has merits; there is some pleasing sculpture introduced, and appropriate too."

The Doctor burst out a-laughing. "You mean, Sir, that the globe is a fitting symbol to be introduced over the entrance—and you are right; but I think, Macky, that there is a further appropriateness which you have not noticed." "Pray, Sir, what is it?" "Why, Sir, do you not see the little cherubim (I would prefer to designate them 'amorini') on either side the sphere; one industriously pointing out the spots of interest and apparently gazing forward for his master's approval, the other urchin evincing no manner of interest? They are symbolical—ha! ha! ha!—of the Industrious and Idle Apprentices." I laughed in concert, but I cannot always follow the doctor's plunges into humour, though at such times I conceal this defect, as he is apt to make scoffing references to the land of my birth.

But I had put an idea into his head, and he was apparently bent on further reference to it. "You asked me as to development? Why, truly, Sir, if by that is meant the piecing together of different 'styles,' I would admit the development; for of recent years there have arisen various buildings where the elegance of Renaissance art has been conjoined to the exuberance of Gothic—and at times not unhappily. Here in Fleet Street, amongst buildings erected within the last five years or so, you may perceive

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HOUSE AT NORTHWOOD, MIDDLESEX, FOR J. R. WUIDART, ESQ.—Forbes & Tate, Architects.

more than one instance of this, and on my own dear St. Clement Danes Church there is a slight admixture. But, Sir, it is not blameworthy if it be effected with judgment and taste. What I dislike to observe is the limited grasp of mediæval ideas as displayed by so many of our architects."

"Sir, I should be glad if you would enlighten me."

Dr. Noonlush: "Sir, I will with pleasure. The mediæval workers had a reason for all, or at least for most of what they did; a pier, a buttress, a gargoyle, a niche—no matter what—was introduced as reason or necessity dictated; and when they gave vent to their ideas of artistic effect, they did so on rational lines, with due regard to the sensibilities of the intelligent observer. Now consider, Sir, just one detail of those I have mentioned—say, the niche. In the olden days there was never a niche introduced without the intention of providing it with a tenant. But our architects choose to regard it merely as an ornament, and, if they want justification, point to the many empty niches on mediæval buildings. They fail, Sir, to grasp the fact that there the omission was an accident; and they fail also to perceive the lack of artistic finish provided by an empty niche on an otherwise beautiful building. And so, Sir, is it often with other features. Buttresses are now used very frequently merely as projective ornament, and similarly with gargoyles, pinnacles and other details."

We were now within sight of the offices of the *Standard*, and I was struck by the dignified appearance it presents. "Yes, Sir," said my companion, "you do well to approve it, being eminently suited to its purpose. Observe how sturdy solidity is made the first consideration, and this is modified by the free use of curved lines both in plan and elevation. Some might think there is an excess of curvature, but the criticism is uncalled for. Then, too, observe the restricted use of carved ornament. Sir, it is an entirely satisfactory building, and not the least happy feature is that fine mosaic frieze bearing the name of the journal."

Being so well accustomed to the Doctor's trenchant and caustic criticism, I could not fail to admire this noble display of fairness and good-nature on his part. His face was suffused with the glow of generous enthusiasm, but not for long, as I was very soon to see him in his customary humour, for I noticed his head rolling ominously just as we arrived opposite Mary Queen of Scots' House. Wishing to gain, if possible, some credit for discrimination with my awesome companion, I hastened to remark, "Do you think that Gothic building is very happy, Sir?" "Sir, I do not profess to enter into the feelings of the building. Let it suffice that I am not happy when I look at it; it is indeed Gothic—it is barbaric; the design is as flighty as the Queen from whom it takes its name and whose statue I see in that niche."

"At any rate, dear Sir, the first Scottish building we have encountered is not subject to your well-merited taunt about empty niches."

"Ah, Macky, you dog, but the Scottish building had to be in England; indeed, Sir, I believe the building to be Scottish only in name." (Is there anything that this learned man does not know?) He continued:—"In the entrance corridors of this house, Sir, and of some others in Fleet Street—I refer to those named after my Lords Byron and Nelson and also to Hood House—Sir Tollemache Sinclair has had marble tablets fixed—a perfect plethora in Byron House—containing significant mementoes of these various worthies. The respected Baronet is indeed no great poet, though he would fain make us think so by inscribing on the tablets favourable opinions as to his lucubrations."

M'Jabols: "Indeed, Sir, I have been rather pleased with the Baronet's muse."

"Sir, I do not say that he cannot write, and write well; but he has been unfortunate in his selections for public display; moreover, Sir, it seems too grossly a personal puff to be pleasing. And as regards foreign versification of vernacular poems, it is not mere translations are desired; the subject should be thought out in the foreign tongue, as though the latter were the original medium for the poem. His French rendering of the 'Song of the Shirt' ('Le chant de la chemise,' as he calls it) is but a translation; and it is the same in the case of his English rendering of Béranger's poem on the Queen of Scots. M. Paul Bourget's commendation of Sir Tollemache's 'Chant de la Chemise' conveys to my mind the impression that that astute Frenchman held the same views as I do. Again, Sir, I think these tablets are inappropriate in premises in such a busy centre as the City of London. Moreover, the worthy Baronet's taste in the contrast (inscribed on one tablet) instituted between my Lords Tennyson and Byron by giving statistics as to their works is not conspicuous for its merit."

"Are there, Sir, any original poems of the Baronet's displayed on the tablets?" "Sir, there are; and I refrain from commenting upon them until you have read them; but I would have you specially to note Sir Tollemache's use of the same epigram sentiments towards my Lords Byron and Nelson."

M'Jabols: "I do not much like the frontage of either Byron or Nelson Houses, Dr. Noonlush." "No, Sir; yet were it not for the crude coloured tiles spotted over the former there would not be such an aversion created, though it is in any case of too fussy a design. But Nelson House is the travesty of art. What! apple-green glazed bricks as a pattern, and such an atrocious toned background too!

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Truly our naval hero is to be congratulated in that he did not live to see his name connected with such a building!"

"I will certainly pay a visit to the corridors of these buildings, Sir." "Yes, Sir; and observe in one the monotonous repetition in use of embossed tiles each bearing the motto 'Crede Byron'; and observe also that not only is there a medallion portrait of my lord (the Pilgrim of Eternity, so-called) on the façade behind glass, but there is a somewhat similar portrait in the corridor also, embellished by the motto and the crude coloured tiles as panel framing."

M'Jabols: "You object, Sir, and naturally, to apple-green. How do you like blue, as used on the office buildings of the *Sheffield Daily Telegraph*?" "Blue, Sir, is a mistaken colour to use out of doors; and though employed in moderation in the case you mention, yet it is to be deprecated. Blue, Sir, is apt to look either too glaring and crude, or else too dull and dingy, as in the present case. Were it not for this, the building might receive the sanction of a dilettante, though I am fain to confess it is not in the best taste; but in the use of glazed ware its owners are to be commended, seeing that it is situated in a town atmosphere." "Because of the capabilities of cleaning, I presume, Sir?" "Truly, Sir, though I have noticed a steam-brush system for the purpose, and the results are stupendous, still, a steam-brushed building is apt to give the effect of a face wiped over with a damp cloth instead of being refreshed with soap and water in the orthodox way."

"Sir," I now continued, "I think some of the older work in Fleet Street is more dignified if less architectural than much of the newer work; for instance, Hoare's Bank." "No, Sir; you must not thus distinguish between dignity and architectural qualities; by the latter you evidently connote prettiness, and this limits the idea much too strictly. Messrs. Hoare's Bank, I grant, is pleasing by reason of its dignified simplicity, though truly it is no magnificent piece of architecture. But look at Sir Arthur Blomfield's branch Bank of England by the Law Courts; there we have both dignity and architecture; and indeed the same may be said of Messrs. Barclay's Bank (do you remember, Sir, the old Charley's box that stood there when the old premises of Gosling's Bank confronted us?). Of course, architectural qualities may be apparent in a building that has no special claim to dignity, as in the case of the old Council House of the Duchy of Cornwall, erected in the reign of his late gracious Majesty King James I., of glorious memory; here you will see architecture both within and without." "I visited it recently, Dr. Noonlush, and received much valuable information from the custodienne; at least, it seemed to be valuable." "Why, no Sir! I dispute the value. You may as a rule rely upon dates, names and bald facts, but otherwise ciceronian information is to be discounted. The council-room, as you must have noticed, is a very interesting piece of work, and the simplicity of the oak-panelled wainscoting is pleasantly relieved by the moulded plaster ceiling."

We had been strolling back a few paces, and were now opposite the Church of St. Dunstan's, and I remarked "Does it not grieve you, Sir, to see lay buildings encroaching on the grounds of a church?" The doctor's face grew purple in its wrath as he replied: "Sir, it is a desecration; even from the standpoint of art, the lop-sided effect would be deplorable, and her gracious Majesty Queen Elizabeth's effigy is, by contrast with the former isolated position of the tower, sent much further into the background. But I am not concerned with that consideration. From the standpoint of ecclesiastical dignity and fitness, I deem it most unseemly, for the sake of filthy lucre, to deal thus with Church lands. But there, Sir, I will say no more; I would eat; let us to the Mitre, and I will toss you double or quits for payment. Ah! 'Heads'—*you* pay."

I would not dispute it with the venerable doctor, though certainly I thought it had been "tails"; however, *I* paid.

The Dean and Chapter of Durham are at present carrying out some improvements at the cathedral, the work being done under the supervision of Mr. A. Brown, the clerk of works. The most important is the installation of an up-to-date hot-water heating system throughout the entire building by Messrs. Richardson & Co., Darlington, to replace the old coke stoves. Messrs. Laidler Bros., of New Elvet, Durham, are installing the electric light in the bell tower, which heretofore was illuminated by candles. Messrs. Petty, of Boroughbridge, are re-covering the roofs of the south transept aisle and the south chancel aisle with lead.

MUNICIPAL HISTORY AND WORKS OF A SMALL CITY.*

(Concluded from last week.)

Main Sewerage.

THERE is no doubt that dressed or rough stone conduits, built in hydraulic lime, existed prior to the 1773 Act, and under that Act the commissioners were empowered to cleanse, alter and amend the sewers, drains, or watercourses. These "cundys" were generally oblong, varying from 2 feet 3 inches by 1 foot 8 inches inside to 1 foot by 10 inches. There were also one or two very large conduits from the Castle and the Old Bailey Gateway to the river going east, and probably another from the Cloisters and College going west to the river, as were common in most monastic and feudal buildings, and these have given rise, no doubt, to the whispers of mysterious subterranean passages to these places, and there is little doubt that they were used as a means of ingress and egress in troublesome times. A very voluminous report was made in 1849 by Messrs. Hawkesley, who stated that there were in existence good sewers in eight streets, 1,232 yards in length; imperfect sewers in thirteen streets, 2,181 yards, and streets having no sewerage twenty-three, with a length of 6,889 yards. As to the latter, from time to time I have come across old unused conduits in nearly every street named, so that the list given coincides fairly well with the ancient boundaries of the city, as shown in Major Dawson's report to the Municipal Boundaries Commission in 1835-6, whose then suggested city boundary is identically that existing up to 1906. Under the advice of Mr. Thomas Hawkesley, the Corporation decided to resewer the city, and a contract was let in February, 1852, for 15-inch, 12-inch, 10-inch, 9-inch, and 6-inch pipe sewers, and 3 feet by 2 feet 6 inches and 2 feet 3 inches by 1 foot 9 inches brick sewers. Had this work been carried out thoroughly, and the old sewers used to carry off the rain water, the system would have been nearly perfect, but probably in the interests of economy his scheme was only carried out so far as to replace the imperfect sewers and to sewer the streets having no sewers, a total of 9,070 yards. These sewers entered the river at seventeen different points, and generally for some distance from the outlet were under water. Very few additional sewers have been laid until the present sewerage scheme.

About 1892-3 the Corporation advertised for sewerage schemes, and had a number of engineers' plans and reports before them, and in April, 1894, instructed Mr. Fowler, of Manchester, to prepare a scheme and submit it unofficially to the Local Government Board. This he did, and produced a scheme differing little from that now nearly completed. He estimated the cost at 30,000*l.*, and the annual charges at 1,984*l.* for a dry-weather flow of 220,000 gallons during the active eight hours of the day. This scheme was too costly, and another cheaper one was eventually produced by Messrs. Lomax & Lomax, and the works commenced in 1899. They in turn were superseded by Mr. H. W. Taylor, of Messrs. Taylor, Wallin & Taylor, Newcastle-on-Tyne, who has overcome great difficulties, not without the abandonment of some of the new works executed under his scheme, and of which he will lay before you what I trust will be an instructive description.

When in 1902 I reported on the question of ventilation of the old and new sewers, I drew attention to the fact that, although the river Wear from Durham to the sea at Sunderland falls 10 feet to the mile, where it passes through the city it is ponded by means of dams or weirs (locally "stakes"), so that for weeks together there is little or no flow of water, and this of course in sultry weather. It will at once be seen why the county council urged so strongly its powers under the Rivers Pollution Prevention Act, although even with a "fresh" of 1 foot over the stakes the river becomes a torrent, and the rapid current washes down enormous quantities of gravel and sand, causing such a dilution and scour that in a short time no trace of sewage could be seen.

The old Hawkesley sewers contoured the streets at a fairly regular depth. There were no manholes, and from time to time I have built these, in laying new sewers or clearing the old ones, and wherever possible have converted the older sewers into surface-water drains only. Owing to this I should think that 15 gallons per head, with half the total flow in six hours, and allowing for twice the dry-weather flow, is a fair

* A paper read at the annual general meeting of the Institution of Municipal Engineers, held at Durham on August 7, by John T. Pegge, President.

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estimate of the maximum quantity of sewage to be dealt with at the works, and Mr. Taylor will no doubt show that he has allowed for any possible increase in population in the future.

Scavenging.

The cleansing of the streets up to and for a considerable time after the 1773 Act must have been indescribable. The work appears to have been done somehow by the four constables of the city and the parish officers. We find time after time wholesale complaints of heaps of street sweepings left lying for several days, only to be, when darkness came on, traps for the unwary to walk into. The first Durham contract was advertised in January, 1819, for sweeping and cleansing the streets, lanes, ways, public passages, and places within the said city, and the suburbs thereof and the streets thereto adjoining for one year, and the streets would be let in districts to suit the parish officers. The provisions of the 1773 Act were:—"All persons shall, as soon as the foot pavement (in front or adjoining to his, her or their house) is made and completed, sweep and cleanse three times at least in every week on different days the footpath extending at least 4 feet in front. The person or persons contracted with for cleansing the said streets, lanes, ways and public passages, and all other public places, shall cause to be swept, cleansed and carried away all the dirt, dung and soil twice in every week upon pain of forfeiting 10*s.* for every neglect, and no person shall take or carry away any ashes, dust, dirt, mire, dung or manure which shall be made in any of the said streets, &c. (excepting the person or persons appointed), upon pain of forfeiting the sum of 20*s.*, provided always that if the inhabitants shall think fit to preserve and keep such ashes, manure, &c., within their own respective houses, gardens and yards, they are at liberty to keep and dispose of the same, providing that they shall not thereby offend or annoy their neighbours, and if they shall continue to keep and preserve the same for two days after notice in writing given by the commissioners or their surveyor, they shall forfeit the sum of 10*s.* a day." This penalty did not apply to rubbish, &c., occasioned by building; but all buildings in progress had to be railed in and lighted to prevent any mischief to passengers. I need not enter further into detail beyond stating that although it was decided to obtain a machine for sweeping the streets in 1846, at the same meeting the sweeping of the districts was again put up to auction. St. Nicholas and Gilesgate parishes were to be scavenged for the year for 19*l.*, South Street and Framwellgate, including Crossgate, for 6*l.*, New and Old Elvets, 6*l.*, and the Baileys 3*l.*, or a total of 34*l.* It is related in that year that Crossgate was swept on Thursday, April 23, and again on May 14 in the same year. At the present day this work (inclusive of cartage, approximately 82*l.*) costs 468*l.* per annum.

The average cost of scavenging and watering streets, cleansing of ashpits, and collection of refuse from houses and cartage to tips at suitable places since 1898 is 1,567*l.* per year, and for 1908 1,864*l.* The refuse is carted, where possible, on to farms or tipped into disused quarries. There are eight carts constantly employed, and 250 loads removed per week. I reported to my committee that almost half of this, or 120 loads, is material having a calorific value one-sixth to one-eighth that of coal, and suggested and prepared plans for a Meldrum's 1-unit plant at the baths and washhouses for the Elvets refuse; a further 1-unit plant to be hereafter built for Gilesgate and the Market Place, and a 2-unit plant at the sewerage works for North Road district and added area to be utilised in pumping the town's sewage. The baths afforded an excellent opportunity, as the coal bill is about 120*l.*, and the cartage saved would be at least 15*l.*, or (making allowance for extra labour) a saving of about 80*l.* per annum. The outcry in that district, however, was so unanimous and so well organised that the Council then decided not to proceed with the scheme.

Horses.

I might here state that we keep our own horses, and have a large corrugated-iron cart-shed and hay store over the yard, with stabling for twelve horses, boiler-house, stores, &c., and horsekeeper's house adjoining. In the lower yard there is a well-ventilated "sick" box, having a beam and tackle for slinging, with store for medicine and attendant adjoining. The cost of this was only 190*l.*, and it is invaluable. The fodder is let by contract each half-year, and the best-quality clover hay and Scotch potato oats, with a little linseed and bran, is the only food given, at a cost per horse per week of 15*s.*, including veterinary attendance and shoeing. The rolling-stock comprises rolley, two iron tumbrils, three water-carts, two horse brushes and twelve carts, mostly made locally to specification. The ashes carts have wood covers, with canvas rolls (Newcastle pattern), at an extra cost of 5*l.* 10*s.* each.

Police.

The state of towns up to the introduction of gas lighting and policing must have been indescribable. For instance, in February, 1736, it is recorded of London that street robberies, burglaries, and murders were frequent owing to insufficiency of convex lights, being defective for half a year, and for many nights during the other half, and no lights after midnight.

In Durham, prior to April, 1814, there were only two constables appointed annually for the city and two for the borough of Framwellgate. The churchwardens of all the parishes exercised some sorts of powers of policing. The roughs of that date were so much out of hand here (as in other places) that the Secretary of State interfered, and as a result the Baileys, Market Place, South Street, and the Elvets were lighted with oil lamps, but it was not until 1821 that the commissioners under the Paving Acts of 1773 appointed a member of the Newcastle Police, with others under him, "to apprehend all who transgress laws which the want of police has so long encouraged." The powers given under that Act were to appoint a sufficient number of able-bodied men, not exceeding twenty-four in the whole, to watch the said city and to be invested with the same authorities as constables have by law.

He was afterwards appointed to report all nuisances, also to inspect, along with the four constables, all weights and measures and bread, the punishment for shortage being the destruction of the weights and measures, the distribution of the bread to the poor of the several parishes, and, in addition, "mitigated" fines on the offending tradesmen.

The assize of bread was discontinued in 1822. The parish pounds for straying cattle appeared to be wholly under the control of the lords of the manors. Until the introduction of gas-lighting the police seem to have had a lively time of it. They had to cause the owners of all houses to fix spouts, so as to enable the public to use the paved footways in wet weather, to deal with loiterers at the "pullen" corner and other streets, to hale up the parish scavengers for neglecting to remove the rubbish on Saturdays, to punish offenders for breaking lamps, for slaughtering in streets, hooping or cleansing casks, sawing wood, binding, making, or repairing wheels, shoeing or farrying horses in the streets, conveying water from house roofs other than by small drains under footways, the erecting of sign-posts, sign-irons, pent-houses, bow windows, porches, sheds, butchers' gallows and crooks, cellar windows, and the erection of projections, encroachments, or other annoyance whatever, to prevent carts standing in streets, barrels being rolled on footpaths, the driving of carts, drays, wagons, trucks, or other carriages faster than a foot-pace, or without some person on foot leading the shaft or thill horse by a halter.

They had also to bring up the "sports" of that time who during the night waylaid and insulted peaceable inhabitants, pulled up the newly-fixed and as yet unlighted gas lamps, also railings on the new quays at Gilesgate and Crossgate (where the gradients had been lowered), to say nothing of the numerous burglaries and robberies. At any rate, the police reported in 1824 that since their appointment in 1821 they had no less than 785 persons apprehended and confined for breaches of the peace. I do not find any record of fire-extinguishing apparatus until July, 1823; but at a great fire which threatened to burn out the west side of the Market Place in December of that year it is again stated that the two new fire engines were used, and succeeded in saving that part of the town. Since then there are very few references to the apparatus in use from time to time. Now the high pressure of water in the mains renders a steamer unnecessary, therefore we keep a sixteen-manual at the baths for the outlying districts, with a volunteer brigade of eighteen members, a fire escape in the Market Place, a 40-gallons chemical extincteur and hose on wheels in the police reel-house at the town hall, whilst the five higher parts of the city are each provided with a hose-box containing six 75-feet lengths of Shand, Mason's hose, standpipe, key, and nozzle, "Morris" instantaneous couplings, and list of hydrants. The police force comprises a chief constable, an inspector, and seventeen constables. Recent legislation, involving the reporting on licensed premises for compensation causes increased labour in plans and reports, and this year at the County Licensing Sessions seven licences have been reported in this city for compensation.

Time and space will not permit me to dwell on the Sanitary Department beyond that, since 1900, owing to the efforts

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of the medical officer of health and the sanitary inspector, this city may now almost be described as a "water-carriage" town, the ashpits having decreased both in number and in size, and the sanitary condition of the city being improved to an enormous extent. The question of education is one that does not afford much interest from the departmental point of view to the municipal engineer, excepting that the enormously increased outlay in problematical systems and their attendant officialism is very often an excuse for the cutting down of the necessary work of public development, maintenance of roads, paths, drains, and other branches of municipal organisation, and it is very likely in the near future to hamper us in Durham. The city has, of course, its town clerk, magistrates' clerk, rate collector, and city accountant, who have also private practice. I, however, notice the tendency of accountants to interfere with the legitimate scope of the municipal engineer, and rather think that this interference with our work by other non-technical officials will have to be met in a very firm manner.

Lighting.

The coronation of George III. was celebrated by the inhabitants of this city placing rushlights and candles in each of their house-windows, and these and the time-honoured lanthorn appear to have been the only means of illumination after sunset. Naturally the idle youth, vagrants, burglars, garotters, and other like evil-doers must have had a rich harvest and happy time, if one judges from the local *Durham County Advertiser*, from whose issues I have culled many facts, and my obligation to the editor is hereby acknowledged. The Mayor of Durham held his court-leet and court-baron in 1814, and a public meeting was afterwards held to consider the riotous conduct in the Elvets, Baileys, and South streets after dark. As a result of this the commissioners decided to put lamps in the streets.

These lamps were to be lighted from September 21 to April 3, and provided with best whale oil and cotton wicks, to burn with a full, clear light from sunset to sunrise, except during the five nights before and two nights after each full moon. It was soon complained that these "children of darkness" referred to made it one of their most popular pastimes to steal or smash the lamps wholesale, and this continued up to 1818, when matters had come to a climax. At 1 a.m. on November 25 there were lighted only one lamp in North Bailey, one in Sadler Street, one on Elvet Bridge, two in Market Place, one at the gaol, none in Silver Street, Framwellgate Bridge, or South Street. This caused the St. Nicholas parish in December to appoint four special constables to assist the city constables in their duties, and also to visit public-houses at ten on Saturday nights to desire landlords not to furnish liquor to idle and disorderly persons. Early in 1823 a public meeting was held to take into consideration the lighting of the city and the borough of Framwellgate with coal gas, "and Mr. West (who has recently lighted Stockton, Richmond, &c.) is to carry out the intentions of the commissioners before next winter." This was accomplished, for it is recorded on January 2, 1824:—"The city was partially lighted by coal gas on Saturday and Sunday last, and wholly on Monday evening. The change which this substitute of gas for oil has effected is perfectly surprising, for we behold a city long notorious for its nocturnal darkness become at once perhaps one of the very best-lighted towns in the kingdom. The street lamps are placed much nearer than is usual in most towns, and this, added to the brilliance of the lights, completely fills our narrow streets. A band of music paraded the streets, and the church bells rang a merry peal in compliment to Mr. West, who has at his sole expense erected the works, laid down the pipes, and provided the lamps, engaging to light the town for the same sum that the lighting with oil has cost, the usual charge for gas in towns possessing local advantages as Durham being from 2*l.* 10*s.* to 2*l.* 12*s.* 6*d.* per lamp for the season; but Mr. West has contracted for less than 1*l.* 4*s.*, he supplying all pipes, pillars, services, &c., usually paid for by the commissioners of other towns. Thus Durham has exchanged a light barely sufficient to render darkness visible for one of great beauty and brilliancy without having been at one farthing expense."

In 1841 the first gas company was formed, the undertaking being purchased from Mr. West by gentlemen who were all members of the Corporation, and the vendor quite expected it was being sold to the city. An opposition company was commenced—the Coal Gas Consumers' Supply Company—but this was eventually merged into the above company, and the whole concern transferred to the present company in 1873, who extended the works and area of supply, which is now as follows:—Area of supply, about 33 square miles; houses supplied, 4,507; gas made in 1908, 126,398,000 cubic feet; sold, 100,610,000 cubic feet. There is a special carburetted water-gas plant, by Humphreys & Glasgon, capacity 200,000 cubic feet per day. The price of gas is 2*s.* 9*d.* to 3*s.*, according to quantity used. The company can charge 1*s.* per 1,000 extra for outer districts, but only charge 3*d.* The greatest difficulty over practically the whole area is caused by subsidences due to colliery workings. The company also has a sulphate of ammonia plant. At the end of 1908 there were 1,148 gas cookers and heaters out on hire, notwithstanding the fact that so many residents have their coal supplied free. Up to the year 1902 the city had been lighted by flat-flame burners, one-half of the lamps being extinguished at midnight from October to April, and three-quarters extinguished altogether from May to August, the number of lamps being then 285 5-feet and ten 10-feet burners, and the amount paid per 5-feet lamp being 3*l.* 4*s.* per annum.

The company met us very fairly and agreed to convert all lamps into incandescent burners within a stated time, and to provide all lighting and upkeep as before and mantles, the lamps to be all lighted throughout the year from sunset to sunrise (but one-half to be extinguished at 11.30) at a cost of 3*l.* 0*s.* 6*d.* per lamp per year, and including the newly-added area, there are now:—

	£	*s.*	*d.*
360 ordinary burners, about 3½ feet per hour, 60 to 80 yards apart . . . each	3	0	9
10 four-burner lamps, special Welsbach, each	16	10	0
2 public clocks . . . . . each	16	0	0
3 special single-burner high-pressure lamps in Market Place . . . . each	16	18	0

these charges including all maintenance, attention, and replacements of every kind.

Electric Lighting.

Early in 1901 the Council leased their powers for twenty-one years to the Durham District Electricity Company, and this company's interests were taken up by the County of Durham Electric Power Distribution Company, having their generating station at Carville-on-Tyne, near the source of the coal supply. There is a transforming station just outside this city on the north, from which the current is supplied to the Durham station, now a supply centre only, the Babcock & Wilcox boilers, Chandler engines and dynamos not being now in use. The Aykley Heads sub-station takes its supply at 20,000 volts three-phase, forty cycles per second. Here it is transformed to 5,500 volts, and received at Durham city by means of two separate feeders. The feeders are lead-sheathed cables, laid partly solid and partly drawn in through earthenware ducts, the latter having been originally laid for tramway cables. By using this method the cables, which at this part of the route are armoured, were drawn through without again disturbing the streets. At Durham city sub-station the supply is converted to 480 volts direct current by means of motor generators.

The mains originally laid in the city were three-core vulcanised bitumen cables laid solid in wooden troughing; for later extensions three-cored copper, lead and paper-covered cables have been used, laid solid in earthenware troughing. The low-tension feeders are triple-concentric vulcanised bitumenised cables, also laid solid. The parts outlying the city are supplied by means of overhead three-wire lines, in some cases triple-braided cables being used, in others bare conductors with split neutrals.

The pressure of supply in the city is, on the three-wire system, at 240 volts for lighting and 480 volts for power, and all motors above one horse-power have to be connected across the outers. The number of connections to the company's mains in Durham is about 500. The tariffs are:—

Lighting, 3¾*d.* per unit less 5 per cent. discount.
Motive, 1,000 B.T.U. per quarter . . 1.5*d.* per unit.
Next 50,000 ,, ,, ,, . . 1.25*d.* ,, ,,
,, 50,000 ,, ,, ,, . . 1.00*d.* ,, ,,
,, 50,000 ,, ,, ,, . . .75*d.* ,, ,,
Heating radiators, 1½*d.* per unit, if on separate circuit and meter.

Water Supply.

In the opening historical section of this paper it is stated that in 1450 a supply of water was put into the Market Place, the pipes being in 3-feet lengths, seamed butt jointed and burnt and tafted ends, the lead being virgin lead, containing silver, from the bishop's mines in Weardale, some of which are unearthed from time to time. Previous to this the sole

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supplies of water were, for Gilesgate, from the Hallow Well, and in the Church Fields a little east of St. Giles Church; in the Elvets, as the names imply, water was abundant in shallow wells; for the south side of the city, St. Oswald's Well on the river banks west of that church; for St. Nicholas and the Palace Green, St. Cuthbert's Well on the river banks west of the Abbey Church, and one for the use of the monastic buildings on the College Green, supplied from springs near Southend. On the west side of the River Wear there were the spring near the Prebends Bridge, the South Well below the technical school in South Street (then Southwellgate), the Framwell, about the site of the gasworks below Framwellgate, the Flash or Flass well or spring on the old city boundary to the west of the railway viaduct, and the Neville or Crossgate well behind the Miners' Hall on the North Road, water being sold in skeels for general use at 1*d.* per skeel, a custom surviving till only forty years or so ago. However, in 1818 the water supply in the Market Place pant being bad, and the pant and its pipes being out of working order and repair, it was proposed to fix two pumps on each of the two bridges "where the public could get pure and wholesome water." Considering that some twenty-five to thirty old stone drains and sewers emptied into the river above these points, probably the townspeople thought otherwise. Colliery workings, various sources of pollution, the gradual filling up of graveyards, &c., notwithstanding, these supplies continued in use till 1844, when the Durham Water Company erected works just outside the south-east corner of the city, with pumps and a service reservoir on Mountjoy Hill near, and the city received a supply of filtered river water until 1880, Messrs. T. & C. Hawkesley being the consulting engineers. This company was taken over by the Weardale and Shildon (now the Weardale and Consett) Company, for whom Messrs. Hawkesley still act in a consultative capacity. The Durham area of supply is, roughly speaking, somewhere about fifty square miles, with a total population of 100,000 persons. There are no great difficulties of supply except those due to colliery workings, subsidences, and occasional anxiety owing to districts being isolated, but repairs can now be done under pressure, and, owing to the system of duplicate pipe-lines, most of the districts are not without water for long. The consumption for domestic purposes is about ten gallons per head. The water charges are 7½ per cent. on the rack-rents, and through meter 7*d.* to 2*s.* per 1,000 gallons, according to quantity used, baths and water-closets being charged for in addition. The highest pressure in the city is 160 lb., and the lowest 30 lb. This constant and cheap supply of a soft, pure water, though of a slightly peaty colour, has an important bearing on the health of the inhabitants, most of whom are underground workers. I have to acknowledge the kindness of the gas, water, and electric companies' officials in supplying much of the above detail.

In connection with gas, water, and telephone trenches, for small repairs we charge material and labour, adding about 10 per cent. above net cost to cover establishment charges and other unforeseen costs, except in long trenches, when all are charged per yard run for reinstatement:—

Roads.

	s.	d.
Setts only	1	7
Macadam	0	8
Cobbles	1	6
Setts on concrete	3	9
Wheelers on sand (relaying only)	0	9
Cinder paths	0	8

Paths.

Flags	1	5
Setts	1	6
Asphalte	2	0
New flags	5	9
Kerbs (ordinary 12 inch × 4 inch)	0	6

During the last nine years the total average annual receipts for labour and material, as above, have been 196*l.* 10*s.* 6*d.*

Markets.

The markets and tolls in the city were on more than one occasion handed over to Durham by the bishops and afterwards the privileges withdrawn and granted to the bailiffs of the city or marshal of all the markets in the bishopric, owing, I suppose, to misuse of the proceeds which should have been applied mostly to the repair and maintenance of the principal roads used by the bishop and prior and their retinues. In December, 1821, they were leased to the Corporation, who transferred them to the present Markets Company in 1851. There has been a much-needed and marked improvement in the management recently of the covered market, and it is becoming a prosperous concern. Part of the property between the town hall and the church reverts to the Corporation and Smith's Charities in 1916-7.

I hope that the members of this Institution will forgive me if I have failed in the attempt to place on record the history of municipal life in towns 100 years ago, as exemplified by that of the place of our first annual meeting. An attempt has been made at originality of treatment rather than showing you so much important municipal work at so much cost. Plans and specifications will be hung up in the town hall for your inspection to show how our work is and has been done, and I can only hope and trust that your visit will be one you can look back on as having combined both pleasure and profit.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* contains an article by Professor W. H. Goodyear on "The Architectural Exhibition at the Brooklyn Museum," which, whilst eulogising, and perhaps justifiably, the collections and surveys of the Brooklyn Museum, is also to some extent a fighting article on the Professor's favourite object of research, the refinements or, shall we say, abnormalities, of the setting out of ancient buildings. Some examples are shown of Italian churches whose plans are axially oblique. The principal illustrations of this number of our contemporary are of cottages and small houses.

La Construction Moderne is up-to-date and gives illustrations of docks or garages for dirigible airships at Moisson and at Issy-les-Moulinaux, these being shown with the steel skeletons in position from which the form and construction of the latest development of architecture can be studied. Our contemporary has another racy article on Mont Saint-Michel and the heterogeneous committee charged with the consideration of the reclamation of the Bay and its effect on the Mount.

Deutsche Bauzeitung, from the architectural standpoint, reviews, with some illustrations, the exhibition of house-equipment at Berlin. There is also a critical report on another new mono-rail system of transport.

Het Huis has an illustrated article on the history of the Wall Welshuis at Amsterdam, the asylum of the Reformed Church of the Walloons, and another on the picturesque water-gates of Amersfoort.

Der Profanbau devotes practically all its space to an appreciation, with illustrations, of the work of Ludwig Bernoully, of Frankfort-on-Main, a representative modern German architect of the school that relies on simplicity of wall with picturesque complexity of roof treatment for effect. Some of Herr Bernoully's interiors are very charming.

The *Engineering Record* has an article on "The New School Buildings of Cincinnati," which are intended to be of fireproof construction, for which reinforced concrete is used. An interesting account is given of the heating and ventilation plant of the Harvard Medical School, which is remarkable on account of the flexibility of the arrangement of apparatus and the standardisation of the designs in the separate structures.

COMPETITIONS.

AN international competition is announced for the erection of the Polyclinic Institute of Jose de San Martin, Buenos Ayres, Argentina. The author of the design placed first will be employed to prepare the working drawings, and to superintend the whole of the works (unless he should be at the same time the constructor of the same) under the general control of the assessors' committee. The author of the design placed second will be awarded a premium of ten thousand peso nacional (2,000*l.*), and of the design placed third 1,000*l.* The plans must be submitted before December 10. A pamphlet containing the terms and conditions of the competition, in Spanish, may be seen on application at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C.

The Lord Provost, Magistrates and Town Council of the city of Glasgow have granted a site in the West end (Kelvingrove) Park for the Scottish Exhibition of National History, Art and Industry, to be held there in 1911. They have also agreed to support the undertaking and to do everything possible to render it a success. The site is most central and convenient of access. The undertaking is also having the keen support of a number of eminent London Scots.

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Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Angles in Greek Architecture.

Sir,—Will you allow me to state in your columns that since sending the five Greek examples of angle application recently illustrated in *The Architect*, I have collated twenty-eight more, both Grecian, Doric and Ionic, and find that they also are founded on the angles of 67½°, 60°, 45°, 30° and 22½°, either singly or in combination with each other or with the arc of a circle?

This variety of application ensures individuality in design.

It might be supposed that with so many methods of solution any rectangle would submit itself successfully to the process of application, but that is not the case, as may be tested by trying the different methods on forms of rectangle other than those found in these examples.

The curve, as might be expected, enters more largely into Ionic than into Doric design.

I trust to find some opportunity of giving publicity to these illustrations, as I believe they will be found an interesting subject of study to the student of Classic architecture.—I am, faithfully yours,

Edinburgh: August 23. G. S. Aitken.

Brick-Clay a Mineral.

Sir,—I have been much interested in reading Mr. Montgomery's letter in your last issue. Now, Sir, Mr. Montgomery is a gentleman who happens to know what he is writing about. His life, as doubtless you are aware, is spent in connection with the brick and tile industries, and as he is a capable and a good business man, surely his protest should have some weight with the legal gentleman who is responsible for this Budget of Budgets. Mr. Lloyd George may be excused from taking as much notice as we might wish of the complaints of his opponents, but when one of his own hard-worked supporters, and an authority at that, raises such an important point, then the legal training of this gentleman ought to serve him in good stead, and he should weigh the question most carefully. I am afraid the hon. gentleman has got into the unfortunate position of no consideration, no surrender, and he will be in the proud position of ruining an important industry, and by this means hastening the political death of his own party. Whatever happens, Mr. Montgomery is to be thanked for his effort, and should even now at the last moment his protest be successful he, with your aid, will have earned the thanks of all engaged in clay-working, as is the case of yours obediently,

Clayworker.

Highgate, London, N.: August 23.

Sir,—Montgomery knows and says brick-clay is not a mineral; the highest legal gentlemen of the land have said all along that this is so. But a David has arisen—a great legal light! goodness gracious, a Lloyd George; and he says all these gentlemen are wrong. Why argue, then? Why write letters, Mr. Montgomery? How futile; what waste of time and ink! All we can hope and pray for is plenty of backbone to the House of Lords, and then, Mr. Lloyd George, take your pension and, as Uncle Sam would say, "Git!" Nevertheless, thank you, Mr. Montgomery, and thank you, Mr. Editor, for permitting the growl.—Your obedient servant,

A Worker in Clay.

From the Black Country: August 24.

The Homeland Association, Ltd., have recently issued a handbook entitled "Where to Stay in the West Country" (1*s.* cloth and 6*d.* paper), which contains the result of a survey by the Homeland Association of nearly fifty towns and districts in that section of the west country served by the London and South-Western Railway, a survey made from both the visitor's and residential points of view. A second volume to complete the survey of the west country will shortly be issued, and cannot fail to be of value.

GENERAL.

The Beckenham Education Authority are about to erect an elementary school for 500 children in Witham Road.

The Officials of the London County Council and the Lambeth Borough Council are conferring as to effecting changes in Belvedere Road, which will make it a more imposing thoroughfare when it has to form the southern "front" to the new county hall. This road is to be widened, and it has been decided to plant it with trees, which will be provided by the County Council and afterwards maintained by the Borough Council.

The Plans for the new recruiting office that is to be erected on a site now being cleared in Great Scotland Yard are being prepared, and when the building is finished it is expected to be a model of its kind. The present inconvenient quarters for the London recruiting district are at St. George's Barracks, in the rear of the National Gallery. It is stated that several of the more important centres will have new buildings.

The Plans of the chapel for the Order of the Knights of the Thistle having passed Edinburgh Dean of Guild Court, the preliminary arrangements in connection with its erection have begun in Parliament Square, Edinburgh. A hoarding has been erected around the portion of St. Giles's Cathedral to which the chapel is to be added, and no time will be lost in commencing to build the actual structure.

The South Metropolitan Gas Company state that as a result of their experiments with a new inverted burner, designed especially for street lighting, they are able to make a substantial reduction in the charges for the maintenance of street lamps fitted with the new burner, which, it is declared, gives a light of 120 candles compared with the 80 candle-power of the old burner.

An Estate of three acres recently acquired by the Council of the Hackney Young Men's Christian Association at Stamford Hill, including two large houses utilised as an Association institute and hostel, will be formally opened on September 18. The scheme provides for the erection of a large, well-equipped gymnasium and additional residential accommodation for at least fifty young men.

A Local Government Board Inspector held an inquiry on Saturday into an application by the Weybridge Urban Council for a loan of 5,000*l.*, the money to be used for the purchase of the common and heath from the Poor's Land Trustees. The proposal was strenuously objected to by the cottagers, who possess a right to take the land for spade cultivation.

An Effort is to be made to raise 3,000*l.* to defray the cost of completing the restoration work at Rochester Cathedral which was begun under the direction of Sir Gilbert Scott.

The Vice-Chancellor of Oxford has received an intimation from Mr. J. B. Carrington, of Hampstead, that he will contribute to the University 160*l.* for the completion of the carving in the coffers of the gallery niches in the New Schools, according to a design and estimate furnished by Mr. T. G. Jackson, R.A. Mr. Carrington has already contributed sums towards the decorative carving in the Schools amounting to over 550*l.*

The Surveyors of the local authorities interested having reported that the north abutment of the old bridge at Stirling is in need of repairs, and the whole structure requiring a general overhaul, a committee recommend that application be made to H.M. Office of Works to have the bridge and its approaches protected under the Ancient Monuments Protection Acts. If this course is not taken the committee further recommend that the surveyors submit a joint report and estimate of the cost of the work to be executed.

Mr. John A. Grainger (of Messrs. Grainger & Little, architects, Melbourne, Australia), formerly chief architect of the West Australian Government, has been making an inquiry into the architectural division of the Public Works Department, Victoria, for the Premier (the Hon. J. Murray). Mr. Grainger has suggested various reforms for carrying on the departmental work, and speaks very highly of the previous work done by the department.

Messrs. William Hodge & Co., Edinburgh and Glasgow, will shortly publish a work entitled "Construction, Equipment and Management of a General Hospital," by Donald J. Mackintosh, M.B., M.V.O., medical superintendent of the Western Infirmary, Glasgow. The author has made a special study of the theory and practice of hospital construction and administration. Besides plans of the most approved types of wards and auxiliaries, the book contains over sixty carefully reproduced illustrations showing wards, operating theatres, laundry and special departments, all kinds of hospital furniture and requirements, &c. The price will be 10*s.* 6*d.* net.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, September 4.

Manchester Society of Architects: Visit to Liverpool to inspect the following buildings:—The New Cathedral, Dock Board Offices, and the Hall and Reception Rooms at the Town Hall (1754).

Conference on Housing and Workmen's Trains at Ipswich.

Tuesday, September 7.

Manchester Society of Architects: Visit to the Y.M.C.A. Buildings in Peter Street, Manchester (Messrs. Woodhouse, Corbett & Dean, architects).

Wednesday, September 8.

Berkshire County Offices Competition: Exhibition of Designs for the above at the Dairy Institute, Valpy Street, Reading, September 8 to 18. Admission by ticket only.

Friday, September 10.

Manchester Society of Architects: Visit to the Garden Village a Burnage.

Saturday, September 11.

Society of Architects: Sketching Party to Rochester.

Architectural Association: Camera and Sketching Club, Visit to Guildford and district.

SCHOOLS FOR ARCHITECTS.—II.

UNIVERSITY COLLEGE, LONDON.

THE architectural student who pursues his studies at University College, London, is working under university conditions and has, or may have, before him the goal of a degree as an internal student of the University of London. To attain the degree of B.A.Lond. with Honours in Architecture, the student must first matriculate and afterwards pass the Intermediate examination in the faculty of Arts at the University, and also go through a three years' course in the day school at University College.

This school therefore is intended primarily for younger students, those who have recently left a public school and at the end of their stay there have passed their Matriculation examination and so become undergraduates of London University. During their career at the School of Architecture they are students of the premier college of the University of London, with the benefits of tuition in general knowledge that appertain to university education, and very many of the advantages, beyond mere tuition, that are the accompaniment of a university course, though not perhaps to so great an extent as at the older universities of Oxford and Cambridge, in which the social element is more largely developed than at London. There is a tendency in all schools where technical study of some particular calling is pursued for the students to be too much restricted in their companionship to those of their own profession, and this tends to narrowness of idea and lack of comprehension of other people's point of view, faults very detrimental to an architect.

At University College the architectural student passes some of his time in the engineering school, part in the Slade art school. He learns English, French, German, history, mathematics, physics and hygiene with those who are not going to be architects, and he meets these non-technical scholars in weekly meetings of the Students' Society. Thus his ideas are not restricted entirely to the field of architecture and he obtains the benefit of the education, in its wider sense, that university training affords.

As it is not every embryo architect that aspires to the honour of a university degree, there are in University College two parallel courses—the B.A. degree course and the Certificate course. The training in each is on similar lines, the main difference being that the aspirant to a degree must read for and pass the Matriculation and Intermediate examinations of the University, whilst the Certificate course does not entail this necessity. Both courses are arranged (1) to provide the systematic practical training that is desirable for students before they enter an architect's office; (2) to enable students to continue their general studies concurrently with commencing their technical training. Thus those who take the Certificate course are required to attend lectures on general subjects and advised to enter for the Matriculation examination of the University. In this way recognition is given to the fact that to an architect a good general education, extending at least to the standard of matriculation at London University, is of high importance.

Both courses include (1) a thorough grounding in the details and theory of building construction, and in the nature, properties, and working of materials by means of (*a*) lectures, (*b*) studio work, (*c*) demonstrations (held at the Trades' Technical School, Great Titchfield Street), (*d*) visits to workshops and to buildings in course of construction; (2) lectures and demonstrations in the engineering laboratory dealing with stresses and strains, strength of materials, and steel and iron construction; (3) lectures on the history of architectural development, in which evolution, especially as regards plan, construction and general principles, and its causes, are traced by analysis of and reference to acknowledged masterpieces; (4) architectural design; (5) measuring and drawing out fine examples of old work; (6) lectures and demonstrations in sanitary science, heating, ventilation, &c.; (7) drawing from architectural casts and from the antique or life in the Slade school, or modelling. The three especial advantages to students at University College included in these courses are the demonstrations at the trades' training schools, where actual craftsmen study and work; the instruction in the engineering laboratory, where practical testing with efficient apparatus is seen; and the study of drawing from the antique and the life at the Slade school, where some of our foremost painters have received their early training.

The School of Architecture at University College is a day school, although there are also evening classes, which form a separate section of the College curriculum. But students in architects' offices or who have already had some experience can join any of the day classes and lectures for a term or session.

A young student, fresh from school, who enters at University College is set to work in the studio on drawing of an architectural character and learns his construction from the very first by designing. He is told to look at actual examples and commences at the earliest stage to use his own judgment in making a drawing of a plain brick wall with holes in it. He sees executed arches and then makes his design more or less like those he has seen, thus developing his own individuality from the very commencement of his career. Thus he very soon learns to design architecturally and bases his designs on the sound foundation of appropriate treatment of material and construction. He is not encouraged or allowed to copy drawings of construction, though these are supplied for purposes of comparison and guidance. He of course is taught to draw the Orders, and in this respect there

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WADHURST CHURCH, SUSSEX.—FROM A SKETCH BY BANISTER FLETCHER.

appears to us a lack of equipment in the College and a deficiency in the method of study. We have said before, and we cannot too often repeat it, that in architectural schools there is generally too great a tendency for students to draw the Orders from printed illustrations. In this way the embryo architect does not realise the effect in the solid of what he draws in line. All study of the Orders should be accompanied by reference to casts, preferably full size, of the actual example drawn.

Measuring old work is encouraged, and the student is set to first measure and draw some part of the building of the College in which he is studying. Most of the work in this branch of study is done during vacations.

In addition to studio work and forming a relief from it, attendance at lectures is obligatory on all students. In the first year this is very largely concerned with general subjects selected under the advice of professors from a list comprising mathematics, mechanics, ancient and modern languages, history, chemistry, physics, geology, &c. The technical lectures in the first year are on building construction and materials, isometric projection, a most valuable method of representing construction, perspective, sketching and measuring. In the second year the study, in addition to studio work, includes lectures on construction, the history of architectural development, lectures on stresses and strains with experimental work in the engineering laboratory and drawing from the cast, antique or life. In the third year the work includes essays on the history of architectural development, drawing from the life or antique, attendance at lectures on sanitary science, heating, ventilation, &c., besides the preparation of drawings and designs required for the B.A. degree and for the certificate.

To obtain either the degree or the certificate a student must submit for approval not fewer than six drawings in each of the following groups:—(*a*) From the cast or life (one example of architectural modelling, or two sheets of sketches from actual buildings may be substituted for two of these studies); (*b*) details and theory of construction; (*c*) drawings of an architectural subject or subjects, measured and drawn by the student. For either the degree or the certificate a candidate must also submit a design for a building from a subject set by the examiners and worked out before the examination.

Thus it will be seen that the three years' course of study in the School of Architecture at University College furnishes a very excellent training for those who intend to enter the architectural profession before they actually start the real experience of an architect's office as pupils or assistants. The school is very efficiently staffed, with Mr. F. M. SIMPSON as professor and Mr. LESLIE WILKINSON as his assistant. The school is at present in an early stage of its career, and the number of students is not just yet very large, which is an advantage to those who join, as they thus receive a larger share of individual attention from the Professor and his assistant. The many-sidedness of the education required by a modern architect is well recognised, and instruction of a very high order is provided in the scientific part of that education as well as in draughtsmanship, whilst the individuality of the future architect is very carefully fostered, and thus ability in design is developed along with a knowledge of practical matters.

The fees for the complete course in the day school are 45 guineas for the first year and 35 guineas for each subsequent year. For architectural classes only the fee is 12 guineas a term; for history of architectural development 2½ guineas a term or 6 guineas a session; for building construction or history, and one day a week in studio 10 guineas a session, or two days a week in studio 15 guineas a session.

NOTES AND COMMENTS.

THE summary fashion in which the House of Commons disposed of the committee stage of the Housing and Town Planning Bill does not augur well for a properly considered solution of many points of difficulty with which so novel a measure is likely to teem. When clauses of such a Bill are put in batches and amendments ignored wholesale, it is clear that there is insufficient opportunity for discussion of what in the opinion of many

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of our legislators are defects in the proposals of the Government.

THE curriculum of the Architectural Association for its School of Architecture for the session commencing this month has been issued. The system of education hitherto established in both the day school and the evening school is maintained on similar lines as before—studio work both in the daytime and in the evening, with lectures and classes. The ordinary meetings of the Association include papers on "The Architectural Association Excursion to Cheltenham and District, 1909," by F. DARE CLAPHAM, F.R.I.B.A.; "Drainage and Sewage Disposal," by W. D. SCOTT-MONCRIEFF; "Architecture of the Incas of Peru," by G. REGINALD ENOCK, F.R.G.S.; "Varallo, Orta, and Varese," by F. C. EDEN; "A Comparison between English and Continental Ornamental Ironwork," by J. STARKIE GARDNER; "Renaissance Church Architecture in France during the Sixteenth Century," by W. H. WARD, A.R.I.B.A.; "The Life and Work of WILLIAM BUTTERFIELD," by E. SWINFEN HARRIS, F.R.I.B.A.; "The Mediæval House," by J. ALFRED GOTCH, F.R.I.B.A.; "The Life and Work of BRUNELLESCHI," by Professor BERESFORD PITE, F.R.I.B.A.; "The Architecture of Bath," by MOWBRAY A. GREEN, F.R.I.B.A.

THE British Fire Prevention Committee has not only done good work here in the attainment by its experiments of knowledge most valuable to the community, but it has inspired people abroad with a desire to emulate its work, and at the conference of the French Fire Service Association held last week at Caen, when Mr. E. O. SACHS was present, it was decided to form a national fire-prevention Council on somewhat similar lines to those of our own committee. There is one essential difference, however. The British committee is a privately organised affair, supported principally by the contributions of its founders and members. The French Council is to include representatives of the Government departments more immediately concerned, and the conference at which its inception took form was presided over by M. CHÉRON, Under-Secretary of State for the French Navy. M. LÉPINE, Prefect of the Paris Police, who has always taken a great interest in the British committee, and has frequently come over to attend its functions, has consented to act as chairman of the organising commission of the new body. Thus from the first the French Council starts with official recognition and assistance instead of the snubs and cold water that were the lot of the British committee.

THE re-erection of Crosby Hall on its new site in Chelsea is now to be actively commenced, and it is expected that in eight months time or thereabouts it will be ready for opening to the public and for its use by the residents in the University Hostel.

TRADE secrets have a knack of becoming revealed when the light of the law shines upon them, and the latest seems to be that when architects have specified "Austrian" oak they or their clients have really been receiving Japanese timber, which, it was stated in the case of W. W. HOWARD BROS. & Co. *v.* TURPIN'S Parquet Floor Joinery and Wood-Carving Co., Ltd., has during the last three or four years been finding its way into the English market and displacing Austrian or, more properly, Hungarian oak. Of course, there was the usual difference of opinion as to the quality of the wood supplied, the one party asserting that Japanese oak is as good as "Austrian," the other denying this assertion and stating that Japanese oak is not of "Austrian quality." The jury decided in favour of Japanese oak being of "Austrian quality."

WISDOM dearly bought by experience is at length coming to those municipal authorities who in a wave of philanthropic beneficence with other people's money have been rushing into housing schemes. The Manchester Corporation has applied to the Local Government Board for release from its obligation to build houses in place of those to be pulled down for the purpose of erecting three new schools. The houses to be demolished number thirty-six, and within half a mile of these there are 732 empty houses, so the necessity for compliance with the obligations imposed by the Housing of the Working Classes Acts to replace those threatened is not very evident. There can be no doubt that in very many instances houses for the working classes provided by ratepayers' money are not needed, and when built will not let except to those who do not intend to pay their rent.

THE plumbers have once again jeopardised the existence of one of our national monuments. York Minster has narrowly escaped destruction by fire, and only at the cost of some damage from the water used to quench the ignited timbers of the lower roof of the north transept, where the plumbers were engaged in repairing the leadwork. It should by now be recognised that whenever plumbers or other trades requiring the use of fire are at work on a building of great value and importance, there should be a professional fireman on duty ready to at once detect and extinguish an incipient conflagration.

THE committee appointed to investigate the Lake villages in the neighbourhood of Glastonbury in connection with a committee of the Somerset Archæological and Natural History Society has reported to the British Association at Winnipeg that, owing to the amount of work thrown on the hands of Messrs. BULLEID and ST. GEORGE GRAY in compiling and arranging the details of the monograph on Glastonbury Lake Village, it was found inexpedient to resume excavations this summer on the new site at Meare, but the committee hope to make considerable progress in excavating the Meare Lake Village during the summer of 1910. Judging from the discoveries already made and recorded, this new lacustrine site promises to be richer in archæological remains than even Glastonbury.

THE news that an hitherto unknown picture by REMBRANDT has been discovered in Newcastle is not devoid of probability. The master was not so greatly esteemed in his own time and his own country that any of his contemporaries or pupils would be inclined to forge his manner and his signature, and it is difficult to imagine that, spite of the skill of the makers of antiques, the peculiarities of REMBRANDT'S technique can be entirely mastered. Nor is the picture likely to be a copy, for if it were it still remains to account for the original. Newcastle is not an unlikely place for a Dutchman's picture to rest in, and there have ever been private individuals who have bought artistic masterpieces because they liked them and intuitively recognised the high quality of work that did not at the moment happen to be fashionable.

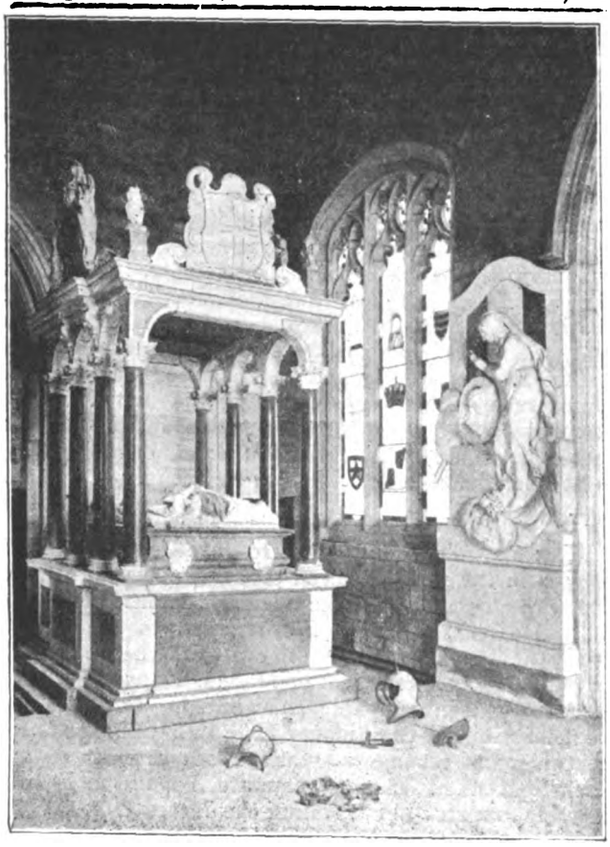
NICHOLAS STONE'S WORK AT OXFORD.

TIME has erased much of the architectural work of this sculptor, whose commissions were as extensive in number, if not in importance, as those of his coadjutor Inigo Jones, although he did not attain the age of this eminent architect. The veil of mystery which has enveloped their productions has yet to be fully lifted, and it is just possible that a key to the solution is a thorough investigation of the part taken by Stone, whose record embraces much of the chief work of Jones, such as the Banqueting House, Whitehall; Queen's House and terraces, Greenwich; York House, Strand; Old St. Paul's Cathedral; Somerset House; Oatlands Park, Berks.; Windsor Castle; St. James's Palace; and Hampton Court. The names of Tarthall, Bagshott Lodge, Theobalds, Cornbury Park, Nonesuch Palace, and many others recall to us past glories of the Jacobean Age, all of which held examples of his handiwork.

While there is no certainty that Jones ever visited Oxford, we know that Stone was a frequent traveller, having been to Cornbury no less than thirty-three times in two years, 1631-33, for the Earl of Danby. His cousin, Gabriel Staces, acted as his agent there, assisting him also on the Fountain

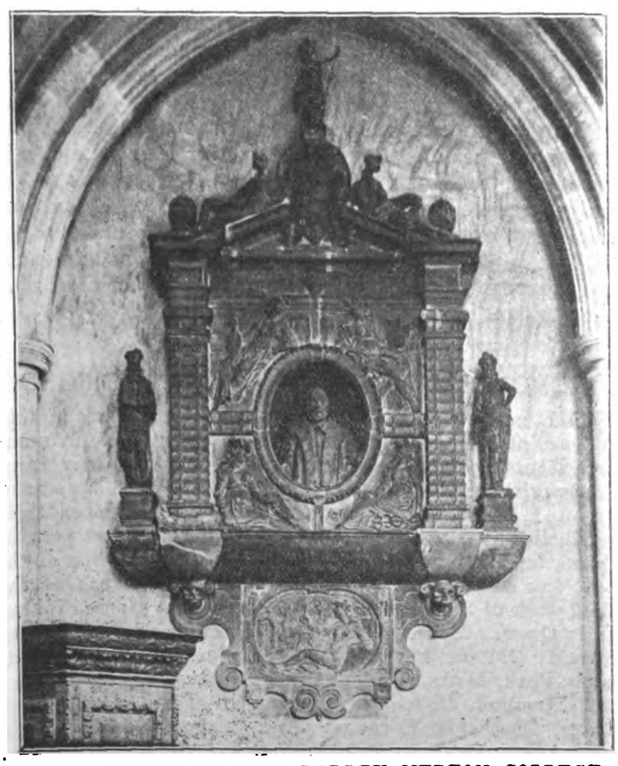
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at Somerset House in 1636 in conjunction with Hubert le Sueur, and at Greenwich the following year. Is it possible, therefore, that he was associated with Laud's alterations to St. John's College, Oxford, which works were in progress during 1631 to 1635, since we know that Le Sueur, with



TOMB OF WILLIAM, 2ND BARON SPENCER, GREAT BRINGTON CHURCH.

whom he was acquainted, executed the bronze figures there from an account in the Record Office, and that Heylyn may be mistaken in ascribing the work to Jones? St. Mary's Porch was executed in 1637 at a cost of 230*l.* for Dr. Owen,



MONUMENT OF THOS. BODLEY, MERTON COLLEGE CHAPEL, 1615.

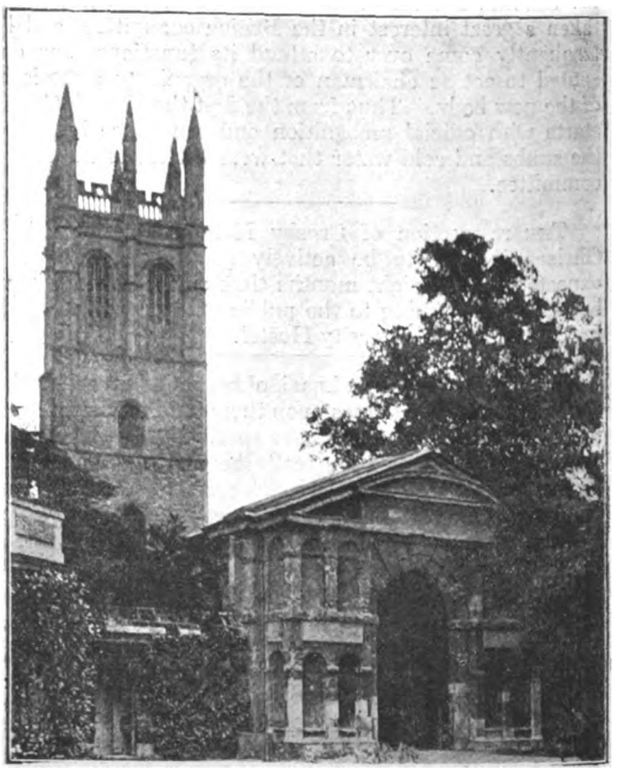
Chaplain to Archbishop Laud, and is from Stone's chisel, but the design has been similarly attributed to Jones without any apparent foundation. One has only to compare a few of the earlier monuments such as that to Lord Chief Justice Coke, at Tittleshall, Norfolk, to see that the *motif* is the same although the porch at Oxford is on a much larger scale. It is curious to note, too, the preservation of part of the fan vaulting of a previous Gothic porch; two of the pinnacles are also retained rising above the twisted columns



MONUMENT OF JOHN BANKS, 1654.

and cornices of the Renaissance addition, indicating that the original porch was of greater projection. Stone had previously used twisted columns in 1619 in the tablet to Dr. Wright at Sonning-on-Thames. The inference, therefore, is rather in favour of Stone having also designed the porch.

Some work was done at Christ Church in 1632 for which



NORTH GATE WITHIN PHYSIC GARDEN, OXFORD.

Dr. Fells, then Canon of Christ Church, paid Staces in two amounts the sum of 69*l.* There are two works of this date in the cathedral, viz., the west window to Charles Banks, Prebendary of Windsor, by Abraham van Linge, and a

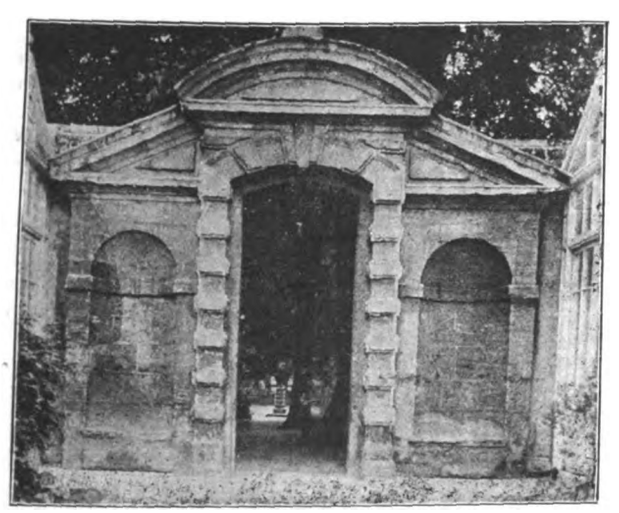
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mural tablet immediately beneath to John Weston, which is more probably the commission; the vaulted staircase is, of course, of later date, about 1640. On the south aisle wall is a delightfully executed cenotaph to Sir John Banks, deceased December 28, 1644, which John Stone records



MONUMENT TO HUGO BARKER, NEW COLLEGE CHAPEL, OXFORD.

having made in 1654 for 50*l*. The freedom of the treatment of this cartouche form of tablet, and the nice quality of the carving of the angels' heads anticipates the Grinling Gibbons work of twenty years later. Comparing this with the Merton College example carved by his father in May, 1615,



THE EAST GATE, PHYSIC GARDEN, OXFORD.

to Sir Thomas Bodley, there is a marked contrast in design. The latter is rather more Jacobean in character and has some points in common with the Sutton tomb in the Charterhouse, which, though on a much smaller scale, was his joint work with Jansens in this same year, the receipt being dated November 24. "Mr. Hacwell of Lincoln's Inn" paid Stone 100*l*. for the Bodley tomb.

Dr. Hugo Barker's monument in New College Chapel was made in 1632. It is of less interest from the point of design; the bust is placed in a black marble niche surmounted by the coat of arms and crest of the professor and the inscription, with plain festoons hanging down on each side; while the monument executed two years later to the two sons of Sir Thomas Lyttleton exhibits another phase in mural decoration, the sons being carved about one-third full size as bearers to the inscription, which describes the nature of their death by drowning in the River Cherwell. Both these examples were made for the sum of 50*l*. each.

Staces superintended the setting up of the altar tomb to Sir William Stonhouse at Radley-by-Abingdon, receiving some of the money towards the total cost of 120*l*. from Lady Stonhouse. This was originally highly coloured and painted, excepting the skull beneath the arm of the surviving son, Sir George, the third baronet, who kneels at the head. Sir John, the heir, died through grief the following year to his father, although the Lady Elizabeth survived until 1653, but the effigy would appear to have been executed previous to her decease. It was probably into this family that John Evelyn's son was married in 1680 to Mrs. Martha Spencer, daughter of Sir John Stonhouse. The arms of Lady Elizabeth are, POWELL, *three griffins' heads, gules, or, a chevron, vert.* A fuller description of this tomb, with illustrations, is to be found in Mr. Bullock's book on the subject of this sculptor's work.*

Cornbury Park, near Charlbury, forming part of Wychwood Forest, also known as Blandford Park, covers an area of over 5,000 acres. In the reign of Elizabeth the property belonged to the Earl of Leicester, and subsequently to the Earl of Danby, Lord Danvers, who added considerably thereto. Stone's "covenant of acord" for the "desine" of this house, including the three gates to the Physic Garden

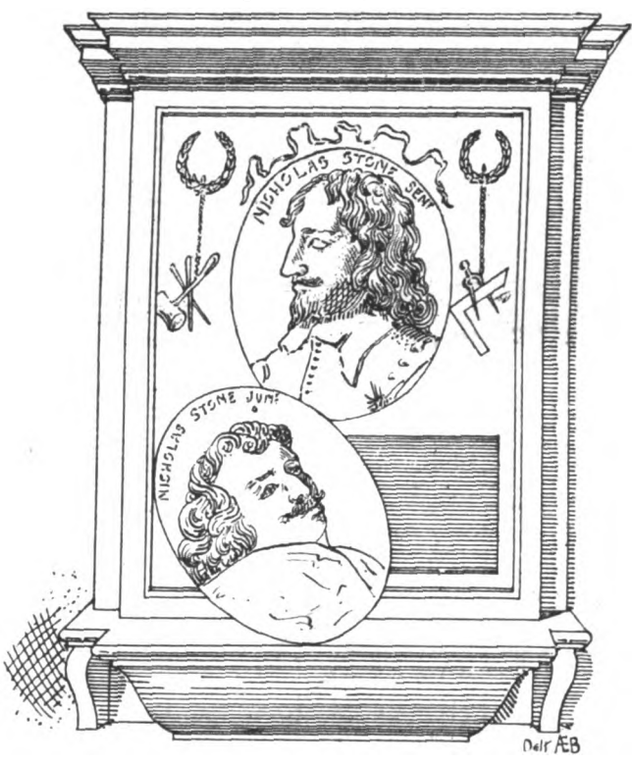


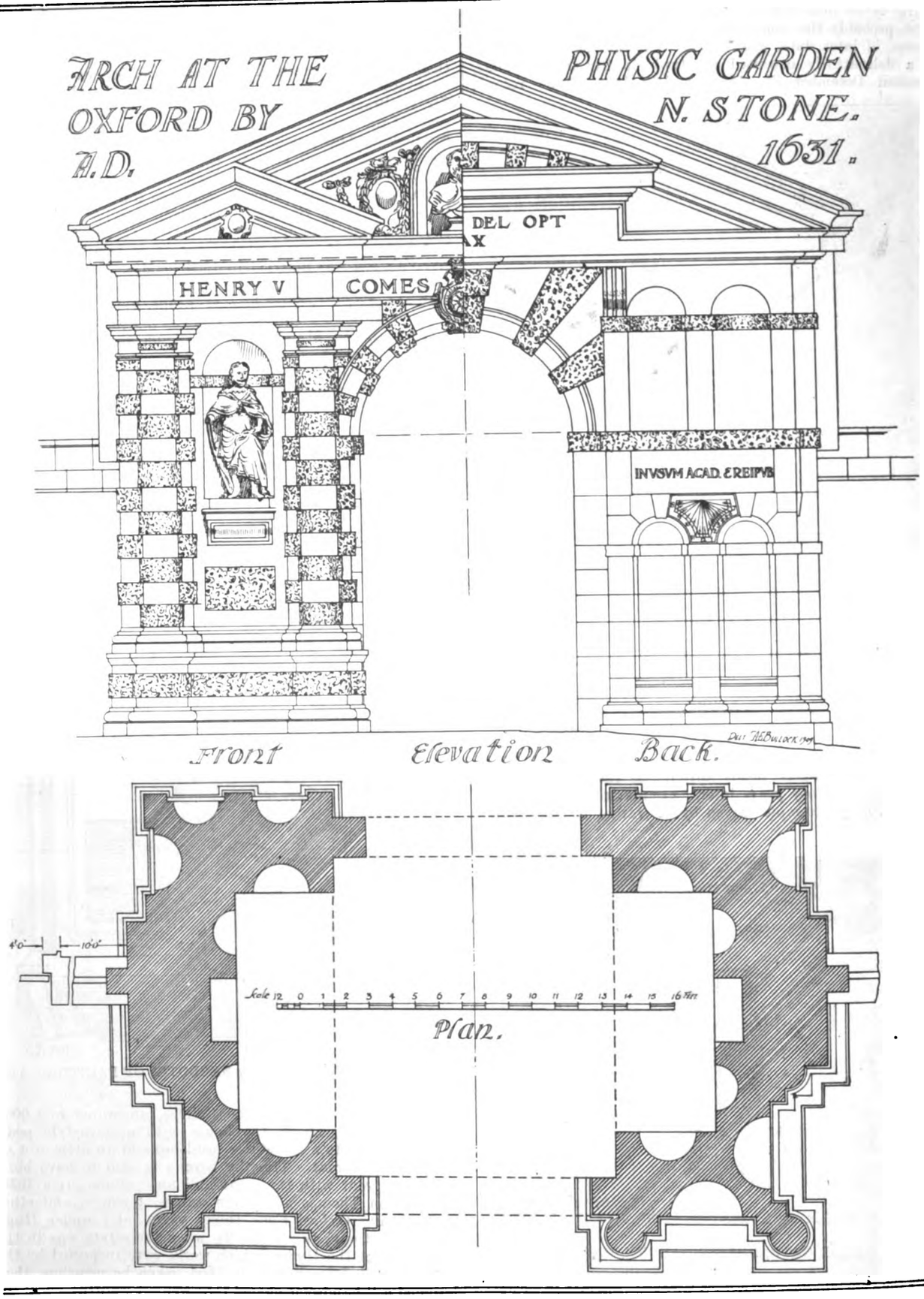
PLATE FROM WALPOLE'S "ANECDOTES OF PAINTING," 1762.

at Oxford opposite Magdalen College, amounted to 1,000*l*. Neale's drawing shows the house with a tetrastyle pedimented portico to a two-storey residence and an attic over on the principal front. Timothy Strong is said to have built the south front with the great hall and cellars, circa 1630, and his son Thomas added the stables, terraces, and other works facing Oxford some thirty years later under Hugh May's directions; this would be when the estate was in the occupation of the Hydes, which works were inspected by the architect and John Evelyn in 1664, when he mentions they designed a "handsome chapel that was yet wanting." With the exception of the chapel, very little of these additions now remain, the most modern portion being added by Mr. John Belcher, and a great part of the old work remodelled for the present owner Mr. Watney.

The three gates to the Physic Garden, of which Jacob Bobart, a German, was appointed the first keeper, are still in a good state of preservation. The principal one is placed at the entrance and has two figures in Roman armour in niches facing the High Street, that to the left evidently intended to represent Charles I., while a bust of the Earl occupies a smaller niche in the pediment, with escutcheons

* *Some Sculptural Works of Nicholas Stone.* (Batsford.)

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bearing arms on each side, and one carved on the keystone of the main arch beneath. On the south side are painted two sundials, their gnomons having perished. The treatment of the elevation here is rather different, having a curved cornice within the pediment, probably to be in keeping with the design of the other two arches flanking the square of the garden to the east and west. These latter are less ornate and rather smaller, calling for no special remark beyond the curious design of the pediment and rusticated arched opening.

From the agreements Nicholas Stone made with his workmen it would appear that he made use of a quantity of Oxfordshire stone called " Keten " (not Ketton in Rutland), employing one Spadman, a mason and brother to Thomas Spadman, cook to Lord Danby, to carve and deliver 20 tons to a certain wharf in 1632, and further consignments for Windsor Castle during 1633-4.

Stone's patent as Master-Mason and Architect to Windsor Castle is dated April 21, 1626, " for all our Buildings and Reparations," in the room of William Suthis, being paid quarterly at the rate of twelve pence per diem at the " Feasts of the Nativitie, of St. John Baptist, St. Michaell the Archangell, the Birth of Our Lord God, and the Annuntiation of the Blessed Virgin Mary," which quaint phraseology is to be found in the original wording of the patent in Rymer's " Fœdera." Of the other workmen employed by

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Stone, mention is made of William Hunt, John Thorne, John Bartholomew, Thomas Richardson, Mr. Heroon, Herbert Klellen, Mr. Woberall, Mr. Wilson, Mr. Hamton (Hampton?), Van de Stene, Robert Pooke, and Thomas Palmer.

A number of monuments were also sent to the churches in neighbouring counties, notably in Warwickshire, Northamptonshire, Bedfordshire, and Berkshire; by far the greater number, however, are to be found in Norfolk, Suffolk, Herts, Essex, Kent, and Middlesex. An example at Wroxton-by-Banbury to Sir William Pope is worthy of note from the lightness of the design for an altar tomb 25 feet high, while another at Great Brington Church, near Althorp, to Sir William Spencer, 1638, is similar, the canopy being supported on eight columns. In the same church his son John executed the monument to Sir Edward Spencer in 1656 for 64*l.*, and others subsequently to the grandparents of Col. Osborne at Campton, Beds., in value 200*l.*, and at Nonbottle Church, Northants, to a Mr. Criswell for 100*l.*, and two tablets at Sonning-on-Thames, where his father's monument to Dr. Wright is, viz., to Lady Clark, and an eagle and escutcheon. The monument to Baptist Viscount Campden at Chipping Campden, Glouc s, is said to be by Nicholas Stone, senior, and it is possible the Spencer tomb at Yarnton and that of George Reed at Bredon are from his chisel, the latter having a striking similarity in certain details to the examples at Wroxton and the Charterhouse.

At Cornbrook is another good example of altar tomb by this sculptor, namely, that to Sir Richard Verney of Compton Verney; there is no canopy, the effigies being recumbent upon the top slab as at Westminster in the Buckingham and Villiers monuments. The cost of the Verney example was 90*l.*, and was erected about 1630. It is thought the Lucy monuments at Charlecot are by Nicholas Stone. The effigy of Sir Thomas Lucy has the reputation of being by Bernini; it was more probably by Nicholas Stone, junior, who worked in the atelier of Bernini when in Italy; he carved the figure of Lady Berkeley of Cranford, which was either sent in advance or brought over by him upon his return to England in 1642. The monuments to this latter family are at Berkeley, Gloucestershire. The little son of Sir Robert Nanton is a Northamptonshire monument by the elder Stone, and that at Stow-of-the-Nine-Churches to Lady Elizabeth Carey, which was executed for Lord "Davers" (Danvers) for 220*l.*, where another was subsequently placed in 1619.

Stone's work increased very much about 1636, when he added to his land in Long Acre a further area belonging to Francis, Earl of Bedford, in addition to that he already held of Sir Wm. Slingsby. About 1642 he sent a mural tablet to Berkhampstead parish church to Thos. Baldwin, which is of refined taste in design although the inscription is now very difficult to read. In this same church, in the chancel, is a quaint undated tablet to John and Jacob Moravio. There is an Italian touch about it not unlike the tomb to Elizabeth Drury at Hawstead Church, Suffolk. Time with his scythe is a tasteful terminal if the general construction is a little weak.

There are many other works referred to, as to the whereabouts of which no clue is given in his diary, and one can only speculate that where Inigo Jones was building Stone would take some part, either in the entrance gate piers, as at the residence of the Earl of Wemyss at Stanway, Glouc., occupied by Sir Paul Tracy in the reign of James I., or the chimney pieces, as at Wilton and many other seats. His work carried him far afield, and his workmen were numerous, while in addition his three sons were kept in active employment, so that his notoriety was as great if not greater than any other sculptor of his age. It may be said, too, with very few exceptions, that the standard of refined quality by which he won his name was maintained throughout his career and continued after his death in 1647 by his two surviving sons John and Henry. During the Civil War he remained politically neutral, quietly executing his commissions in his yard at Long Acre, with the exception of the occasion when he assisted Inigo Jones to bury his treasure first at Scotland Yard and afterwards in Lambeth Marsh. John Stone took a more active part, however, by joining the forces of the Royalists, and after narrowly escaping a hanging, fled to France. On his return to England he published a book entitled "Enchiridion of Fortifications, or A Handful of Knowledge in Martial Affairs."

He was the last survivor of the family, and was buried in 1667 with his father and brothers in St. Martin's-in-the-Fields Church; the tablet, which was kept in repair by a near kinsman, Charles Stoakes, does not now appear to exist.

LOADS UPON ROCKS AND SOILS.

MESSRS. GARBUTT & MUNBY write as follows in the "Journal" of the Royal Institute of British Architects:—

It has been suggested to the Science Committee that the available information as to the weights which, under varying conditions, may be safely put upon the different rocks and soils met with in the construction of foundations is both meagre and conflicting, and that if individual members of the Institute would put at the disposal of the Committee the various detailed particulars they must possess as to actual experiences upon their own work, it might be possible to collate the whole and issue the result for the benefit of members generally.

The records of laboratory experiments as to the crushing of small pieces of stone, while useful in connection with building construction, are sometimes misleading if used in considering the bearing power of those materials for foundation purposes. And of course there are many materials, and those probably the most common, that cannot be usefully dealt with at all upon a small scale.

In view, among other things, of the facts (1) that a large uniformly loaded surface will generally sustain a greater load per unit of area than a small one, (2) that the amount of moisture in the soil may greatly affect its value as a foundation, (3) that the possibility of the lateral escape of the load-carrying material is an important consideration, (4) that the compressibility of materials varies much, and (5) that, under some conditions, sliding of the building upon its foundation or of underlying strata upon one another may be anticipated, it is clear that a mere tabulation of the weight-bearing capacity of rocks and soils at so much per square foot cannot be a trustworthy guide in practice.

The Committee therefore invite all who have items of information in their possession to send them to us for the purpose indicated above. It is especially requested that all notes sent be as full as possible, and that all facts likely to affect the results be mentioned. It will be helpful if the spot to which particulars refer can be named, and particulars of the strata both above and below the actual foundation level, together with mention of the depth of foundation below the surface, are desirable.

As this is a subject of great importance to all architects, we venture to hope that there will be a ready and generous response to this appeal. The names of architects and of buildings will be regarded as confidential when such a course is desired by the correspondents; and if the information obtained by the Committee proves of sufficient interest to justify the issue of a report, a draft of the proposed document will be sent to each contributor of material used.

MATT. GARBUTT,
ALAN E. MUNBY,
Hon. Secs. Science Standing Committee.

ILLUSTRATIONS.

MONUMENT TO THE LATE MARQUIS OF SALISBURY, WESTMINSTER ABBEY.

THE national memorial to the late Marquis of SALISBURY in Westminster Abbey was uncovered four weeks ago without any ceremony. It stands under the north-west tower, on the site of the southern screen and close to the allegorical monument by WESTMACOTT to CHARLES JAMES FOX. The Marquis of SALISBURY monument comprises a bronze recumbent statue on a pedestal of Belgian black marble, eight Biblical figures, and six figures of early members of the CECIL family. Lord SALISBURY is represented in his robes as a Knight of the Garter, with the Collar, and in his left hand he clasps a small cross. Behind the cushion upon which the head rests are shields bearing the arms of Trinity House and the Cinque Ports, the late Lord SALISBURY being an Elder Brother of Trinity House and Lord Warden of the Cinque Ports. At the feet of the effigy there is the badge of the Garter, St. GEORGE and the Dragon, encircled in a wreath of oak leaves, and on one side of the wreath there is the shield of Oxford University and on the other that of Westminster. The coats of arms of the four CECILS who have been Knights of the Garter figure prominently on the pedestal. The six figures of the earlier members of the family are—on one panel, Lord BURLEIGH, Queen ELIZABETH'S High Treasurer; Sir ROBERT CECIL, the first Earl of SALISBURY (holding a model of Hatfield, which house he built); and

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[*Forbes & Tate, Architects.*

HOUSE FOR BUSICK E. PEMBERTON, ESQ., ON HAREWOOD DOWNS GOLF CLUB COURSE, CHALFONT ST. GILES, BUCKS.

THE accommodation consists of four public rooms, eleven bedrooms, two bathrooms. The house stands on the top of a hill, is built in brickwork covered with extra fine rough-cast and hand-made sand-faced tiles on the roof. Mr. A. J. BATES, of Chorleywood, is the builder.

the late Lord SALISBURY'S father, the second marquis; on the other panel, their wives. The Biblical figures stand in couples at the corners of the pedestal, and represent SAMUEL and ZERUBBABEL, ISAIAH and DANIEL, MOSES and JEREMIAH, ABRAHAM and JOSHUA. The inscription round the top of the pedestal is as follows:—"Erected by Parliament to ROBERT ARTHUR TALBOT GASCOYNE CECIL, third Marquis of SALISBURY, K.G., G.C.V.O., thrice Prime Minister. Born February 3, 1830. Died August 22, 1903. Domine Refugium." The bronze casting was done by Mr. A. B. BURTON, of Thames Ditton, and the masonry work by Messrs. JENKINS & SONS, of Torquay. Mr. W. GOSCOMBE JOHN, R.A., was the designer and sculptor.

WAREHOUSES, 84-87 CHISWELL STREET, FINSBURY.

THE three warehouses erected for Mr. J. A. CARRAN, furrier, comprise well-lighted basements, ground floor and five floors above. The front elevations are faced with vitrified terra-cotta to the top of the first floor and green glazed bricks with vitrified terra-cotta strings, window dressings and cornice above, executed by the Leeds Fireclay Co., Ltd. The slope of roof in front is covered with green Westmoreland slates, and the flats are constructed with steel joists and concrete, covered with Val-de-Travers asphalte. The windows are fitted with Messrs. HOWARD & Co.'s iron casements, and the same firm have carried out all the steel construction, fire-escape balconies and iron guard rails. The staircases are fire resisting throughout, carried out in accordance with the London County Council's regulations. The pavement lights and stallboard lights were supplied by the Improved Pavement Light Co., Ltd. The strong-room doors were supplied by Messrs. CHUBB & SONS, LTD., of Queen Victoria Street. The general contractors were Messrs. PATMAN & FOTHERINGHAM, LTD., and the architect was Mr. C. E. JACKSON, of Broad Street House, E.C.

UNITED COUNTIES BANK, WALSALL.

THE whole of the capacious ground floor and basement are occupied by the bank. The first and second floors, which have a separate entrance from the street, are let off for offices, and caretaker's quarters are situated on the third floor. With the exception of plinth and entrance doors, which are of polished grey granite, the whole of the front is faced with Grinshill stone. The contract, amounting to about 5,200*l.*, was carried out by Messrs. T. ELVINS & SONS and the desks and fittings by Messrs. T. INGLESANT & SONS, from the designs of Messrs. COSSINS, PEACOCK & BEWLAY, Birmingham.

UNITED COUNTIES BANK, DUDLEY.

THE whole of these premises, situated on an exceedingly narrow site, are occupied by the bank, with caretaker's quarters at back. The front is faced with Leicestershire bricks with dressings of green Quarella stone. The contract, amounting to about 1,600*l.*, as well as all fittings and desks, was carried out by Messrs. J. DALLOW & SONS, from the designs of Messrs. COSSINS, PEACOCK & BEWLAY, of Birmingham.

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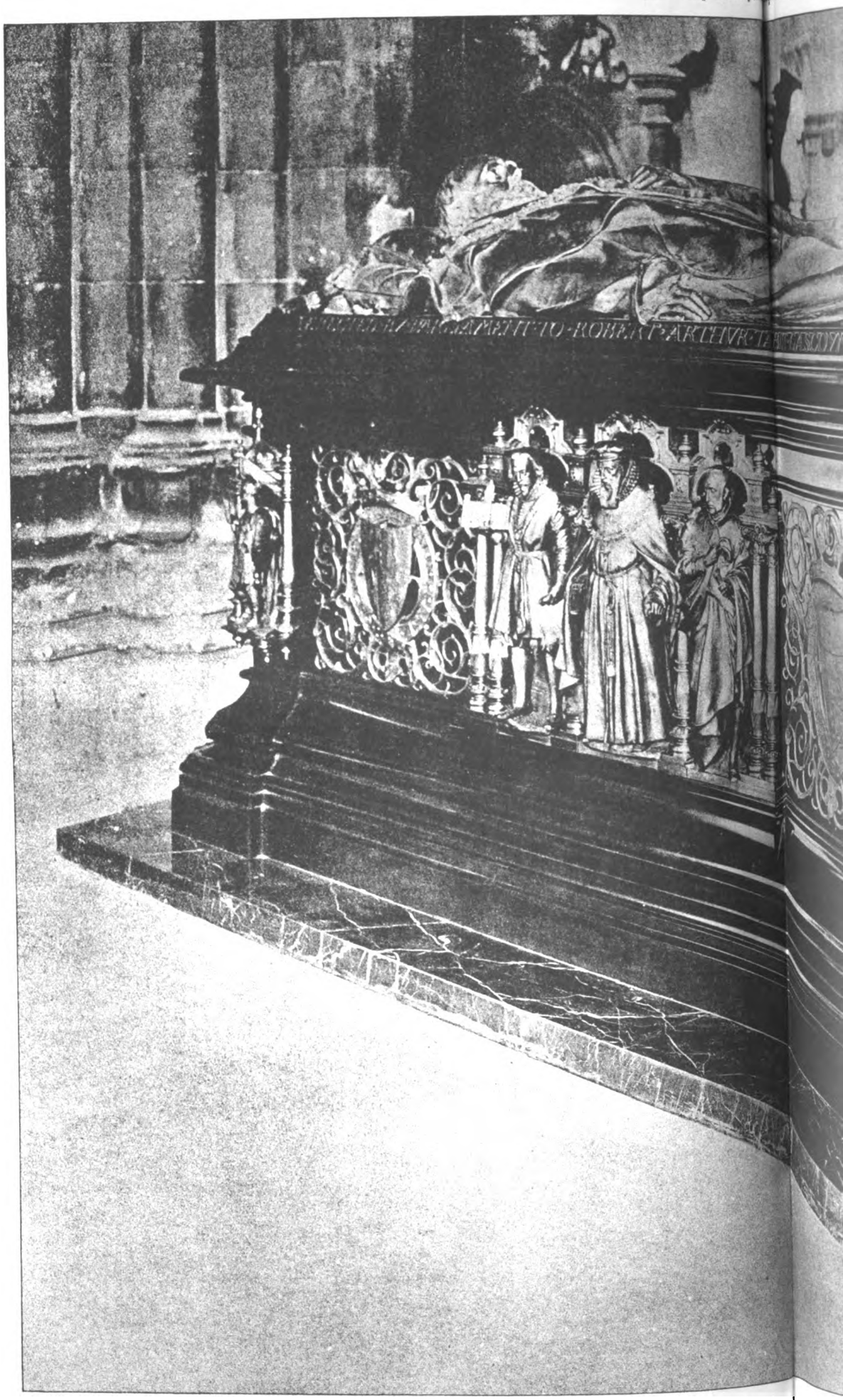
UNITED COUNTIES BANK, WALSALL.

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MONUMENT TO THE LATE MARQUIS OF SALISBURY.

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LATE MR SALISBURY, WESTMINSTER ABBEY.

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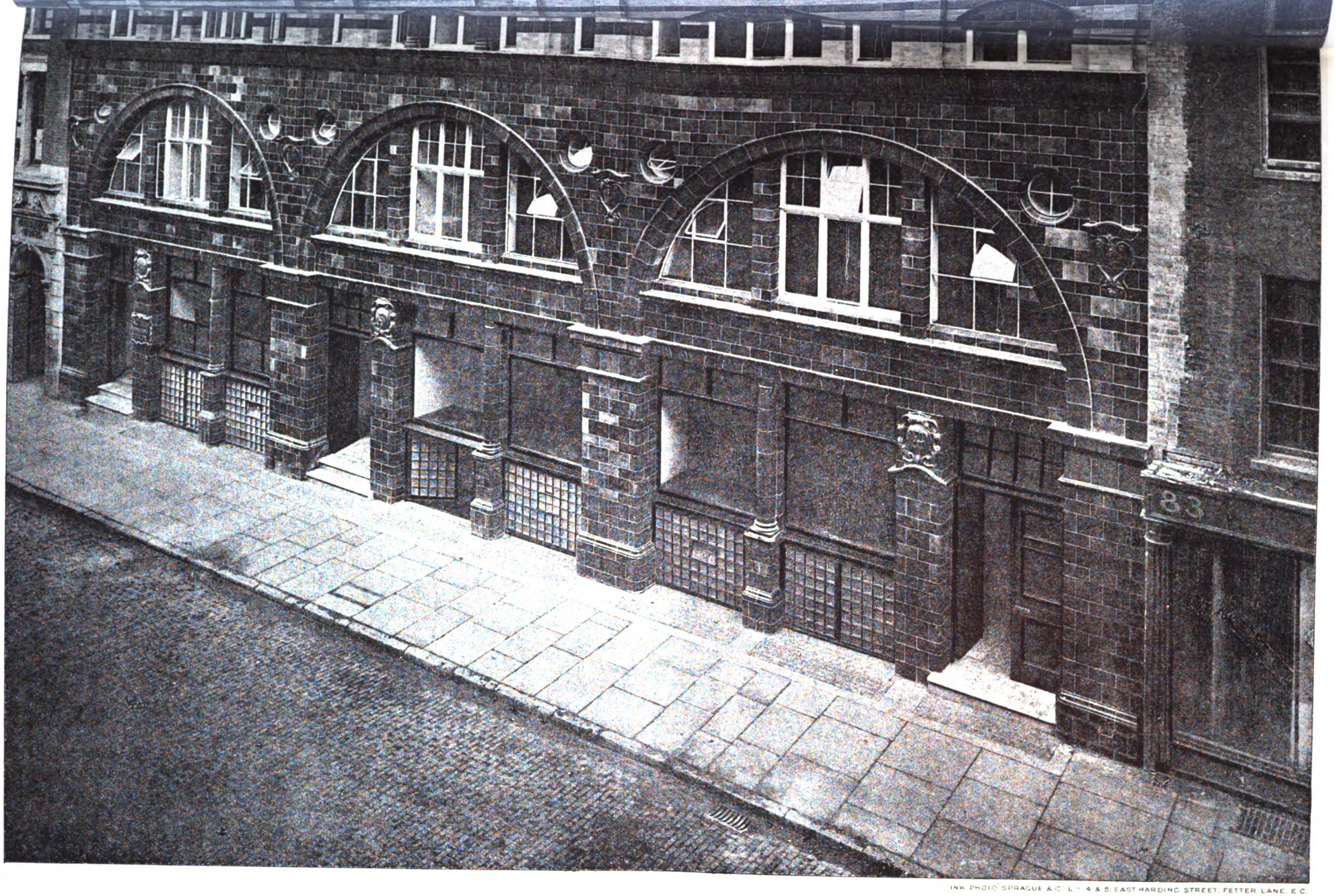
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WAREHOUSES, 84-87 CHISWELL STREET, FINSBURY.

CHARLES E. JACKSON, Architect.

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UNITED COUNTIES BANK, DUDLEY.

Messrs. COSSINS, PEACOCK & BEWLAY, Architects.

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[*Forbes & Tate, Architects.*

STIVERS HOUSE AT CHALFONT ST. GILES

THIS house is situated in the centre of open woodland, has four reception-rooms and ten bedrooms. The builder was E. H. BURGESS, of Gerrard's Cross. It is built in Dutch bricks, and roofed with old pantiles, all supplied by Messrs. AMES & HUNTER, London.

THE SETTLEMENT OF THE SAXONS.*

(Concluded from last week.)

TO cast doubt on the story of Hengist and Horsa, some one stated that the names mean horse and mare; and that half-truth has been retailed by successive writers on the subject. But though Horsa means mare, the word was also applied to a cob, and the short-legged, thick-set younger brother we may regard as the pony. With the early settlers in India the Aswa-Medha, or sacrifice of the horse, was the most sacred of all rites. In the Sanscrit Mahabharata and in the Ramayana it is minutely described. Tacitus, in his "Germania," tells that sacred white horses were kept in the groves of Germany at the public expense, and at the close of the eighth century synods in Mercia and Northumbria prohibited horses being sacrificed to Woden. The banners of the Saxon pirates had the white horse worked on them, and they cut white horses on the hills at Uffington, Berkshire, and Westbury, Wiltshire. It remains as the cognisance of Hanover and Brunswick, and is the symbol of Kent. On the hill above Kits Coity House is a boulder called the White Horse Stone, on which it is said Hengist was installed first King of Kent; the stone was lost sight of for some years, but has again been brought to light. The White Leaf Cross at Princes Risborough is traditionally stated to have been fashioned as a memorial of a successful battle fought there by Hengist and Horsa.

Although in the Chronicle Hengist and Horsa are associated with the Angles, they are generally regarded as having been Iotas (Jutes). After the Jutes came three hordes of Saxons—Ælla and his three sons in 477, who founded Sussex; Cerdic and his son in 495, who established the kingdom of Wessex; and in 527 the party who founded Essex, which then included Middlesex; and finally came the Angles in three companies. The first, about the year 527, gave name to East Anglia; in 547 Ida took possession of North-humbria, later divided into Bernicia and Deira; and about 586 Crida established Mercia; and these seven main kingdoms are termed the Heptarchy.

Later as various kings conquered their neighbours they were termed Bret-Waldas or Weilders of Britain.

The Anglo-Saxon language was derived from the Gothic, was spoken by the Plats, or Low Germans, and was brought here by the Jutes, Saxons and Angles; and modified in spelling and pronunciation, and extended with words from other tongues, it is the language we speak to-day. At first they had a Runic alphabet consisting probably of only sixteen signs; gradually it was increased to twenty-four, v and z not included; but the simplicity of the Roman alphabet soon caused many of the letters to be adopted, and in the revised alphabet j, k, q, v and z had no place; a few combined letters and abbreviations, however, were introduced, and later k and q were occasionally used. The earliest specimen of English is the maker's name in Runic characters on a gold cup found at Schleswig, and ascribed to the middle of the fourth century. Very few Anglo-Saxon Runic stones have been discovered, and seemingly only one in England. It was found in Nottinghamshire about 1618, and William Grimm gives the inscription as Rices Dryhtnes, meaning the dominion of the king, and it is supposed that the cross was a boundary mark.

In 565 or 560, according to Bæda, Æthelberht succeeded to the kingdom of Kent. He married Bercta, already a

* Read at a meeting of the Upper Norwood Athenæum by W. F. Harradence.

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Christian, and he gave her the church outside Canterbury which Hasted quotes as St. Mary's, and states that her chaplain, Bishop Luidhard, rededicated it to St. Martin. At the coming of St. Augustine Æthelberht was baptized on June 2, 597, and gave to Augustine the little chapel of St. Pancras; and Arthur Penrhyn Stanley cites the legend that the "Old Demon" tried to pull it down, and the marks of his claws are still shown. Pope Gregory wrote to Augustine that heathen temples were not to be destroyed, but turned wherever possible into Christian churches; oxen were not to be killed for sacrifices, but for feasts for the poor; and so many Pagan customs, including the nyd-fyr, which lingers in the lighting of the Paschal candle, were retained and gradually adapted to Christian usage. To assist Augustine, Bishop Paulinus was sent by Gregory in 601, and in 627 he converted Edwin, King of the Northumbrians; and Bæda tells us he first built a little church of wood, and later enclosed it with a larger and nobler church of stone, dedicated in honour of St. Peter the Apostle, and this is regarded as the first church of stone built in Britain, and from it York Minster arose. In 604 Sebert, King of the East Saxons, had been baptized by Bishop Mellitus, but not until 654, when St. Cedd laboured among them, was Christianity established. In 635 King Cynegils and the West Saxons submitted to Bishop Birinus. In 636 Bishop Felix converted the East Angles. In 653 the Middle Saxons, under Peada the ealdorman, received the true faith, and in 655 Bishop Diuma converted the Mercians. Although about the year 650 King Ædelwalch had allowed Dicul and his Irish monks to settle at Bosham, it was not until 681 when Wilfrith, driven from York, was shipwrecked at Selsey and built his wooden church there, that the South Saxons gave up their pagan worship. King Ceadwalla, who died in 689, to enable the Archbishop of Canterbury to visit him without leaving his own territory, granted to him all the manors lying between the Canterbury diocese and Lewes, and so the Archbishop's Peculiars originated.

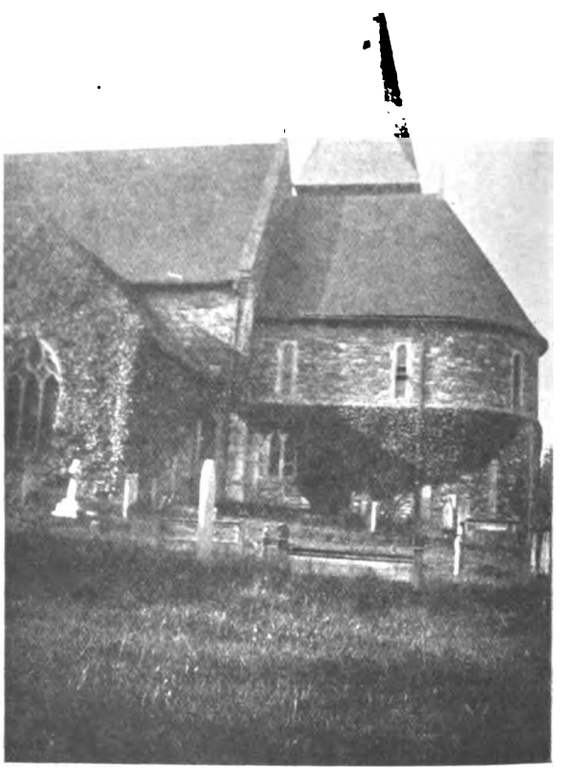
For many years the Anglo-Saxons had no coinage of their own, small Roman copper money being in circulation. Copying the French, they produced a few gold pieces, followed by a silver coin called the sceat, or penny. In Northumbria the chief coin was the copper stycas, the eighth of a penny. The moneyers were scarcely successful in imitating the Latin inscriptions, but reverting to runes they were more intelligible. These bore the name of Peada, who reigned 655; Epa, possibly Eoppa, the brother of Peada; and Æthelred, of Mercia. Offa of Mercia about 775 introduced the silver penny, the most artistic coin yet produced; and pennies were struck in Kent, East Anglia and Wessex. A few halfpence were also coined, but as a rule the penny was cut in half, and occasionally into quarters, and so the four-thing originated.

Offa's annual grant of money to Rome is regarded as the origin of Peter's Pence. His wife is stated to have been a Danish lady, and so would be the first Dane in Britain of whom we have any record. Her name was Kynethryth, and she was instrumental in the murder of Æthelberht of East Anglia. In 787 King Bertric of Wessex married Eadburga, one of the daughters of King Offa, and "in his days" the first accredited descent of the Danes was made, and the question arises, had Eadburga and her mother anything to do with their coming? Asser states that Eadburga by poison removed everyone the king loved, and unwittingly he tasted the wine and died, and henceforth no queen was allowed to sit on the throne by the king, and they were not even styled queen, simply the king's wife.

Ecgberht fought and conquered the neighbouring kings, and in 827 the Heptarchy was virtually dissolved, though Alfred and Æthelstan had to extend and complete the work he had commenced.

In 865 a Danish sea-king, Ragnar Lodbrog, being wrecked on the coast of Northumbria, was captured and killed by being put into a pit of snakes, and his sons, variously quoted as Guthrum, Inguar, Halfdene and Hubba, and thousands of Danes swore to avenge him. It may be mentioned that sea-kings generally were younger sons whose only inheritance was a sword and a ship. Inguar (Ivar the Boneless) and Hubba took possession of Deira in 866, and in 871 Halfdene and Guthrum were with Bagscag when he attacked Reading; and later Guthrum compelled Alfred the Great to take refuge in the Isle of Athelney. In 878 Hubba, with twenty-three ships, sailed to Devon; and Asser tells that with 1,200 other Danes he met with a miserable death, and the Saxons captured his banner, the enchanted raven, which so revived their courage that Alfred emerged from his retreat and completely routed the Danes. Asser further mentions that in the event of victory the raven came to life, but in this battle it hung down motionless. From the Icelandic Edda we learn that Odin has two ravens, Hugin and Munin (thought and memory), who during the day fly all over the world, and returning at eve perch on his shoulders and whisper to him all that has happened, and one of the titles of Odin is Hrafnaguth, the raven's god. Guthrum in his conquest of East Anglia in 880 was aided by Hrolf (Rollo) the Dane, the ancestor of William the Norman.

Alfred, though often compelled to use the sword against the Danes and others, found time to use the mightier weapon, the pen; and there is little doubt that the compilation of the Anglo-Saxon Chronicle was commenced at his Court at Winchester. Of the seven variants now extant, five had been collected by Sir Robert Bruce Cotton in the days of Charles I. To Cotton also we owe the preservation of the "Song of Beowulf." The MS. is late tenth century, but it is regarded as having been compiled at the Mercian Court by a scôp, or minstrel, between 660 and 680, and Stopford Brooke conjectures it was first sung in the fifth century. Little attention had been paid to A.-S. MSS., and when in 1699 Dr. George Hickes, Dean of Worcester, commissioned Humfrey Wanley to search throughout England for them, in the Archiepiscopal Palace at Lambeth a MS. volume of homilies was found in a parchment cover on which appeared a portion of an Anglo-Saxon poem regarded as earlier than Beowulf. Even then no attention was paid by the authorities, and when the volume was rebound, the cover was destroyed. Fortunately Hicks had copied the fragment, which is known as the "Fight at Finns Burgh." The first native Anglo-Saxon poem "The Miraculous Hymn" was written by Cædmon about 670. Bæda, born about 673, besides writing in Latin had translated St. John's Gospel into his native tongue; the MS. was probably burnt by the Danes; a few of his short poems are still extant, and there are some others by Cynewulf assigned to the eighth century, and several earlier poems not of native origin. Alfred endeavoured to make Anglo-Saxon the language of literature; and several works he translated from the Latin, sometimes making additions to them. His works include Bæda's "Ecclesiastical History," "De Consolatione" by Boetius, the "Universal History" by Orosius, and the "Regula Pastoralis" by Pope Gregory. Original Saxon literature virtually died out with the "Vision of Piers Plowman," written by William Langland about 1362; of late date too is the short story "Apollonius," better known to us by the version in the Latin "Gesta Romanorum." In the translation by the Rev. Charles Swan, it is Tale CLIII., and it is interesting as having formed the foundation of Shakespeare's "Pericles, Prince of Tyre."



WORTH CHURCH.

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It was in Alfred's time, 895, that 250 Danish ships entered the Limine, and a ship supposed to be one of them, sixty-five feet long, was found at Northiam in 1822. The Danish and Saxon ships were similar in form; some years ago a Saxon one was dug out of a peat bog in Schleswig, and from Roman coins it contained it is believed to date from the first half of the third century. It is seventy feet long by nine broad.

In the northern parts of Britain the Saxons burnt their dead; in the south they buried their warriors in full military dress, and from the remains considerable information has been derived as to their habits; swords a yard long with double cutting edges have been found, with other arms and various kinds of ornaments.

Alfred's daughter, Æthelflaed, known as the Lady of the Mercians, was the first Saxon who displayed any tactics in war, and places she conquered she retained by erecting burhs or fortresses within them. Commencing in 912 she gradually constructed burhs at Starrat, Bridgnorth, Tamworth, Stafford, Eddesbury, Warwick, Cherbury, Wardbury, Runcorn, Derby, and Leicester; and her brother Eadward the Elder, following her example, erected them at Hertford, Witham, Bedford, Nottingham, Stamford, Manchester, Bakewell, Chester, and Colchester. Eadward in 901 was the first to assume the title of King of the Anglo-Saxons, and it is interesting to note that Eadred in 955 styled himself Cæsar of the whole of Britain.

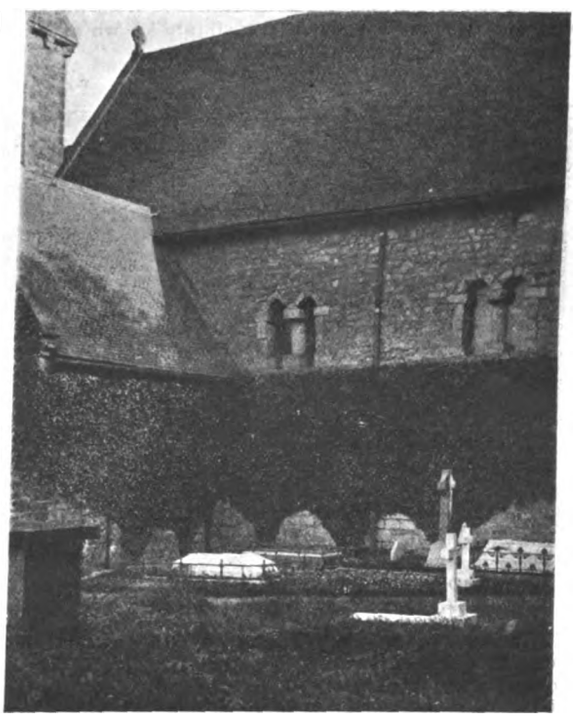
Eadward's son Æthelstan ascended the throne in 925, and was the first king hallowed at Kingston-upon-Thames. Several foreign princes were brought up at his court, and among them was Haco the Good, King of Norway; and among the visitors was Egil, the Danish skald, who in the Icelandic saga bearing his name writes of Æthelstan. In the massacre on St. Brice's Day, 1002, ordered by Æthelred the Unræd̄ig, or council-lacking king, Gunhild, sister of Swein, although a Christian, was killed. Swein was terribly incensed, and the overthrow of the Saxons soon followed.

Worth.

The early Saxon churches were built of wood, as were the cathedrals at Dunwich and Selsey, where the sea now rolls. The only specimen remaining is the little church of St. Andrew at Greenstead, which Dugdale records was constructed in 1013 for the body of the martyred King Edmund to be lodged in on its return from London to Bedriceworth (Bury). The first stone churches of the Saxons merely consisted of a small nave and chancel, and not until the eleventh century was the cruciform plan adopted. The chief features of Saxon architecture as given by Parker are small windows high up in the walls, quoins of hewn stone alternately flat and on end, flat vertical strips slightly projecting and resembling pilasters, semicircular arches and small triangular doorways and windows; and Freeman says:—"The towers are tall and slender, with small round-headed windows with shafts (sometimes balusters) set in the middle of the wall; towers, however, seldom keep their low four-sided spires, but at Sompting the original capping remains." Saxon work remains at Monkswearmouth built by Benedict Biscop in 674, and in the oratory at Jarrow, which he built in 684. St. Lawrence, Bradford-on-Avon, was erected about 694 by St. Aldhelm, who is regarded as the first Anglo-Saxon who wrote in Latin. St. Wystan's, Repton, has a Saxon crypt with pillars and the two original staircases. The Priory of the Holy Trinity and St. Mary at Deerhurst, founded by Earl Dodo, has some arches stated by Walcott to date from 980, and the adjacent chapel of the Holy Trinity, built by Earl Odda in 1056, has suffered little from the desecration it has undergone. Barnack Church is stated to have been built by Canute, and Lower suggests that he was the builder of Holy Trinity, Bosham. He had a palace there, and in the church his little daughter was buried; the stone coffin containing her remains was exhumed in 1865 by the Rev. Henry Mitchell. The churches at Escomb, Earls Barton, Barton-on-Humber, Lewes, Colchester and many others also have distinctive Saxon features.

The great forest of Andreadsleas stretched for very many miles, and the portion that became known as Worth Forest included the present Tilgate Forest, and in a small clearing a Saxon tribe or family had formed their seat or settlement. Although in Alfred's will there is no mention of Werth being left to his son Æthelward, as has been stated, for his legacy consisted of the sum of 500*l.*, it may be that Æthelward received it by deed of gift, for we know that it was a royal manor in the days of Edward the Confessor, and being royal property a wooden church may have existed there in Alfred's time, and almost certainly there would have been one in the days of Æthelstan, for he enacted that if a ceorl (freeman) thrived so as to have five hides of land, a church, a kitchen, a bell tower, and a seat in the Witenagemot, he became a thegan (nobleman); and this was a great incentive to church-building. In the Saxon charters collected by Kemble, three Worths are mentioned—Wrth, in Lincolnshire; Wyrth, in Oxfordshire; and Weorthig, in Buckinghamshire; but there is no allusion to Worth in Sussex. Worth, with its variant spellings, is defined by Bosworth as a close, field, farm, manor, estate, &c. In Sussex the word also occurs in Worthing, Petworth, Densworth, Aldsworth, and Fittleworth.

As late as 1870 Lower wrote, "Worth is not mentioned in Domesday," repeating the words that had been used by Horsfield in 1835. Worth, however, joined the Surrey border, and at the Norman survey it was included in the Hundred of Churchefelle, now Reigate; and it appeared as Orde, the unfamiliar W being omitted by the Norman scribes. As translated by Mr. L. F. Salzmann, B.A., the entry runs:—"Siward holds of Richard, Orde. Oswol held it of King Edward. Then and now it is assessed for half a hide. There is one villein with half a plough. In the time of King Edward it was worth thirty shillings, and afterwards two shillings, now twenty shillings." There is no mention of a church, but in this particular Worth did not stand alone, for in the Survey of Sussex there is no entry of a



SAXON WINDOWS, WORTH CHURCH.

church at Selsey, which a few years before had been the cathedral, of St. Dunstan's Church at Mayfield; nor of the nine churches at Lewes, which, from charters of the time, are known to have then existed. So may we not believe that there was a church at Worth? And as the ablest judges place its date about 1050, I venture to suggest that the rich Saxon Oswol was its builder.

The Richard of the Survey was Richard FitzGilbert, who owned 176 manors, and building the castle at Tonebrige was generally styled Richarde de Tonbridge; and Mr. J. A. Archer regards him as the first Earl of Clare. His property, including, as we may suppose, Worth, passed to his son Gilbert, who, dying in 1115, was succeeded by his son Richard, whom King Stephen had created Earl of Hertford. His son Gilbert died in 1152, and his brother Roger succeeded to the titles and estates, and, dying in 1173, left the property to his son Richard. This Earl Richard had married Amicia, one of the daughters and co-heiresses of William, Earl of Gloucester—also a De Clare—and her sister Isabel was the wife of King John; and we may surmise it was by a friendly exchange of manors that the king acquired possession of Worth.

The Rev. Arthur Bridge, in a very interesting book on his church, quotes from the Burrell collections of an expenditure for timber for Worth Church during the minority of a De

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Warenne, owner of the manor, assumed to be the John, Earl of Warenne, who in 1255 "came in the Octave of St. Martin, at Cycester, and said that in Worth"—and elsewhere—"he had parks, and asked if the king (Henry III.) had any claim" to them, "to which William de Gyselingham said that, for the present, he claimed nothing therein." Dugdale records that in 1278 (Edward I.) John de Warenne, Earl of Surrey, was questioned before the justices itinerant by what right he claimed free warren in Worth and other places. He replied that his ancestors had lost their lands in France through adhering to King John, who had compensated them with lands in England; and he also claimed free warren in the king's manors by right of his name, and his claim was allowed. The rector further says that Worth Church is mentioned in the taxation of Pope Nicholas about 1291. From Horsfield we learn that John, the seventh and last earl, died seized of the Barony of Lewes, including Worth, in 1347. A year or two later his daughter married Thomas Fitz-Alan, Earl of Arundel, and on the death of the fifth earl in 1415 Worth and the other lands passed to the Nevills, Earls of Abergavenny. A survey of Worth was taken by Richard Benton, measurer, October 15, 1583, when the whole forest comprised 5,134 acres 2 roods. Mr. Stebbing shows that as late as 1808 Worth was known as Word or Worde. In Capper's Topographical Dictionary of 1839 the present spelling is given. Worth then consisted of 264 houses and had 1,725 inhabitants, and he gave the value of the rectory as 13*l.* 3*s.* 4*d.*, as quoted by Horsfield from the king's books; and Capper mentions places simply known as Worth in Devonshire, Kent, and Cheshire.



WOODEN HOUSE AND LYCH GATE, WORTH.

Although the original dedication of the church is not known, it is believed to have been in honour of St. Nicholas, who was made Bishop of Myra by Constantine the Great, and took a prominent part in the Council of Nicæa in 325. No better description of the church can be given than in the words of Mr. Philip M. Johnston, F.R.I.B.A., who says the apsidal and cruciform plan, the chancel arch of bold proportions and wide span, the massive transeptal arches, the lofty north and south doorways, the windows in pairs with mid-wall balusters, the external string-course and the pilaster strips are the most noteworthy features of this remarkable church. Mr. W. P. D. Stebbing, who has written the latest and fullest description of Worth, states that the church is built of the local Tilgate Forest sandstone, and adduces evidence to prove that it was erected about 1050, and that the ground plan has never been altered. The position of the Saxon windows—with the exception of one in Oxford Cathedral—he regards as unique. Various opinions have been offered as to why windows were placed so high, but I think it may have been to allow space for mural paintings, which were a factor in the education of the people; and we know the custom survived in the construction of royal and other banqueting halls, where tapestry took the place of wall-paintings. Of mural painting only a little thirteenth century ornamentation remains around a window on the south side. The arched recess in the south transept Mr. Stebbing regards as coeval with the church, and the font he considers is the original one and ornamented in the thirteenth century. The font, curiously, is stated to consist of two basins, the one supporting the other; the panel on the south side is peculiar, having two tiers of pointed quatrefoils, three in each row. In the window of the north transept the arms of a De Warren have been preserved, and it would be interesting if we could regard it as having been made at the early glass works at Chiddingfold. The oak pulpit is dated 1557 and is beautifully carved with figures of the Saviour and Evangelists. Mr. H. S. Vaughan states that it came from Worth, in Germany, a special reason why it was purchased by the Rev. G. C. Bethune in 1841. The inscription is of great interest, as it shows how the language of the Plats—the ancient English—had altered in its native country. As literally translated by the rector it runs:—"Who me loves the same will my word hold, and my father will him love, and we will to him come and a dwelling with him make." (St. John xiv. 23.) The sixteenth century altar rails of foreign workmanship are carved with scriptural and other subjects; the oak minstrels' gallery is inscribed, "This gallerie is the gift of Anthony Lynton, late Rector of this parish, who deceased the xv. day of June, Anno Domini, 1640"; and Horsfield says his name appears on one of the windows of the rectory with the date 1592. Some of the old pew-ends form a panelling in the south transept; near by is an old raised-topped chest with three locks, and two beautiful candelabra of twelve lights adorn the church, upon which about forty years ago the sum of 3,831*l.* was expended. Memorials remain to the families of Gale, Smith, and Blunt, of Crabbet, and to members of the Bysshe, Shelley, and Bethune families. The register dates from 1600, and the old lych-gate gives an added charm to one of the most interesting parish churches in the kingdom.

The place names denoting Saxon settlements can scarcely be numbered, Kemble deriving 1,329 from tribes and families alone. The Saxons gave us the hondred and the scira (shire); from their folk-moots arose trial by jury, and the High Courts of Parliament are the development of their witenagemots. Many noble families point with pride to the Roll of Battle Abbey where the names of their ancestors are inscribed, but a few trace their lineage from the Saxons; among them are the Earl of Durham, the Earl of Scarborough, descended from Liulph in the time of Æthelred II.; and the Marquess of Abergavenny, whose ancestor, Dolphin, son of Uchtred, had a grant of Raby Castle, which Canute had built; and by the marriage of King Alfred's daughter Ælfthryth with Baldwin, the second Count of Flanders, Edward VII. is descended from the great Saxon kings.

In addition to the writers quoted, I am indebted to several others, including William Howitt, Ernest A. Baker, M.A., H. M. Scarth, M.A., Grant Allen, B.A., Romesh Chandra Dutt, C.I.E., J. A. Blackwell, and Wentworth Huyshe; and to Mr. J. Downes I tender my thanks for considerable assistance given me.

THE HOUSE SANITARY.

WHO should be responsible for the healthy home, its drainage, its ventilation, its sanitary condition at large? "The individual," says Mr. Mark H. Judge, whose article in the *Westminster Review* upon "Communal and Individual Responsibility as Regards Health Conditions" has just been reprinted in pamphlet form. "The State," says Mr. B. G. Bannington in the current number of the same Review under the title of "The Rule of Liberty and Health Administration." Says Mr. Judge, "We expend our means on purposes which are outside the proper functions of Government"; he quotes Ibsen's "Enemy of the People" with its bitter satire upon municipalism, and declares that the mass of modern legislation, while pretending to make our public authorities responsible for the condition of every house drain, succeeds in weakening the feeling of individual responsibility and "fails to insist on anything with consistency. Public authorities often do as much to hinder sanitary improvement as they do to advance it."

Mr. Bannington, *per contra*, literally attacks the whole principle of liberty; draws the opposite moral from Ibsen's play—that if the community is blind to danger it "should be led by others more enlightened and experienced in the public needs. The public health is a public charge." . . . Against "malign factors war must now be waged in the interests of the public health. This is a task for the State and not for the individual." It would hardly be possible for issue to be joined more clearly.

The public authorities, says Mr. Judge, too often neglect the public sewers, allow dwelling houses to be directly connected with them, and then, to guard the inhabitants against the resulting evils, "the private dwelling is intruded upon by a public officer." The owner or occupier

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should be held responsible for the sanitary condition of his house, and "it is no more the business of the local authority to provide a sanitary surveyor to design the sanitary arrangements of a house than it is to provide an architect to plan the building." If the communal plan of life be adopted "why not, when in legal difficulties, an application to the local authority's solicitor?"

Increased individual responsibility rather than increased interference by public authorities is what Mr. Judge recommends as the road to improvement in matters sanitary, with the following simple rules to be enforced.

All public sewers or common drains to be public property and in charge of the sanitary authority; between every house and the sewer an air-chamber and disconnecting trap where it can be readily inspected; the drain between the trap and sewer to be public property and in charge of the sanitary authority; flushing and ventilation to be the duty of the authority; no house drain to be connected to any public sewer until after a duly signed certificate as to the sanitary condition of the house has been deposited with the authority; the owner or occupier to be responsible for the disconnecting trap, flushing, and ventilation of the drain on the house side of this trap, "and for keeping the sanitary arrangements of the house in such a condition that no nuisance shall result."

Underlying these details are larger questions vitally affecting the architecture, the health, and the social condition of our great cities. Does the State exist for the individual or the individual for the State? Shall the individual virtually lose his identity and become a municipal unit, allow the sense of personal responsibility to decay and look to the State for everything? Unquestionably the State has advanced and extended its claims of late years to an extraordinary extent, and nowhere more insistently than in building and, above all, sanitary matters. How far shall the system be carried? Can it be extended beyond the point it has at present reached with advantage to the community? These are questions for the public, deeply affecting the future of our great cities. There is another question also which is raised in this connection, a question which greatly affects the architect. Up to a comparatively recent period in England the law confined itself to telling a man what he might not do; the tendency at present is towards laws which tell him what he must and shall do. The subject is too large to be pursued here, but no law can be considered an improvement which weakens the personal responsibility of the citizen for the home in which he lives.

THE OUTLOOK FOR TIMBER SUPPLIES.*

MUCH attention has recently been given to this subject, and the general opinion is that prospects are not reassuring. Britain paid twenty-seven millions sterling for wood on the average of the five years 1904-8, as compared with eighteen millions 1889-93, an increase of 50 per cent. Even Germany, with nearly twelve times the area of forest that we possess, pays annually some twelve millions sterling for imported timber. Although the U.S.A. exports wood and wood-products to the value of twenty millions sterling per annum, she has to pay as much for imports. In Europe, Sweden and Russia are the chief timber-exporting countries, and it seems unlikely that these countries can maintain supplies. Sweden, it is officially stated, is over-cutting her forests to the extent of more than 100 million cubic feet yearly, while Russia is already reducing her exports. In various official publications the Department of Agriculture of the United States has drawn attention to the prodigal method in which her forests are exploited, and has pointed out that in a few years she will not even have timber enough for her own supplies.

There are only two regions of the world that may contain sufficient areas of virgin coniferous forest appreciably to affect the situation. The one is Canada, which in the north-west, and also north and east of Lake Superior, contains large tracts of untouched forest. The growing stock of large stretches of country west of the Rocky Mountains is undoubtedly large, and is now having an appreciable effect on market supplies. The timber that may become available along the line of the new Grand Trunk Railway is much more problematical. The area is vast, but the density of the stock is said to be poor, and the individual trees and rate of growth are small. The other region of the world that contains large stretches of virgin forest is Siberia. Although the density of Siberian forests cannot compare with well-stocked land in Europe or America, her areas are so vast that it cannot be doubted that this country possesses enormous stores of wood. But the difficulty in her case is to get them out. The navigation of the Arctic Ocean is too dangerous to be undertaken for timber cargoes at anything like present prices. Nor would it be profitable to move timber along the Trans-Siberian Railway. The only way to get part of Siberia's timber to market is to float or ship it down the rivers, such as the Amur, that debouch into the Pacific. This is already being done to some extent, and in time such supplies will go some way towards satisfying the demands of China, Japan and Australia.

The growing scarcity of supplies of timber is clearly reflected in the prices on the world's markets. Thus in Britain the largest class of timber has risen in value 28 per cent. in the last fifteen years. Concurrently with the rise in price there has been a marked falling off in quality, so that the real rise in price has been much more than the figures indicate. The United States Department of Agriculture recently issued a table which showed the prices ruling for various classes of timber in various American markets during the past twenty-two years. Of thirty-two brands of timber, nine had risen over 100 per cent., and only two had risen less than 25 per cent. Effective relief through the agency of timber substitutes seems improbable. Concrete and iron are, of course, used to some extent in place of wood, and there is a talk of sugar-cane stalks becoming important in paper-making. But with it all, the demands for wood continue to grow, and although economic prophecies have often proved to be wrong, it seems impossible to escape the conclusion that the future of the world's timber supplies is distinctly disconcerting. It would therefore appear to be in the interests of every country to take energetic steps to prevent the wasteful destruction of timber by forest fires, to see that denuded areas are at once regenerated, and to undertake the planting of all land that can be better utilised under silviculture than through the agency of pastoral occupation.

* From a paper by Professor Somerville, read before the British Association for the Advancement of Science at Winnipeg.

THE AGE OF STONE CIRCLES.*

IN planning the arrangements for further excavations at Avebury Stone Circle, in continuance of the work done last year, the committee were of opinion that the most satisfactory results were likely to be obtained from renewed examination of the silting in the fosse, particularly the lowest layers occupying the original bottom of the huge trench. It was also considered desirable, as a minor operation, to explore the ground at the base of one or more of the prostrate stones of the circle, with a view to examining the original sockets in which the stones stood when erect. Instructions were accordingly given to Mr. H. Gray, whose services were again secured, to concentrate attention upon these two main objects. The details of the excavations, and the results obtained, are given in the appended report by Mr. Gray, and the committee have every reason to feel satisfied with the manner in which the work has been carried out and the care with which the exact position of all "finds" has been determined and recorded.

To expose even a small area of the original bottom of the fosse is of necessity a work involving great labour, owing to the enormous amount of silting which must be moved, and in view of the smallness of the available grant it was necessary to invite subscriptions from other sources. The response made to the appeal for funds has been gratifying, substantial assistance having been forthcoming from societies and from private individuals. A list of donations appears in the accounts for the year, and the committee take this opportunity for thanking those who have contributed so generously; without their assistance, work on any substantial scale would have been impossible. The Rev. E. H. Goddard very kindly undertook to collect subscriptions from members of the Wilts Archæological Society. The thanks of the committee are also due to Lord Avebury and to Captain Jenner for permission to conduct excavations on their property; also to the Rev. T. G. Ward, vicar of Avebury, for assistance in securing labourers. The committee wish also

* Abstract from report of the committee, consisting of Dr. C. H Read (chairman), Mr. H. Balfour (secretary), Lord Avebury, Professor W. Ridgeway, Dr. J. G. Garson, Dr. A. J. Evans, Dr. R. Munro, Professor Boyd Dawkins, and Mr. A. L. Lewis, appointed to conduct explorations with the object of ascertaining the age of stone circles. Drawn up by the Secretary.

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to acknowledge gratefully the courtesy with which the Somersetshire Archæological Society made it possible for Mr. Gray to have leave of absence from Taunton during the period of the excavations.

The main result achieved from the deep cuttings in the fosse is a confirmation of the opinion arrived at last year as to the probable date of the monument. Additional positive evidence has been obtained from the objects discovered in the lowest layers of silting and on the original bottom of the ditch. These in all cases are objects such as are characteristic of the Neolithic period, and although it would be hazardous to state definitely that they must be of Neolithic date and cannot belong to the Bronze Age, the negative evidence afforded by a total absence of copper or bronze and of objects which are certainly of Bronze Age affords powerful confirmation of the probability of the earlier date being the right one. A transverse section of the fosse close to the modern road was expected to reveal the sloping sides of the causeway presumed to exist, connecting Kennet Avenue with the interior of the monument, since at first sight it seemed likely that the road would have followed the line of the causeway. No trace of the latter, however, appeared in this section, and as it was of considerable interest to ascertain whether or not such a causeway had existed, exploring trenches were cut on the opposite side of the road, and the causeway was discovered to the east of the present roadway. This locating of the original line of approach to the interior of the huge circle is a most interesting result of this year's excavations.

Sectional and other plans of all the parts excavated have been prepared with very great care, and a large number of excellent photographs are now available.

The grant from the Association having been expended together with most of the money raised by subscriptions, it becomes necessary to apply for a fresh grant to carry on the work. The committee ask to be reappointed and apply for a grant of 75*l.*, and also for leave to invite subscriptions in order to make up a sum sufficient for carrying out effective exploration. The huge scale of the earthwork renders its investigation comparatively costly and laborious, as the mass of silting in the fosse is very great. It is very desirable to continue the work next spring, in order that making good the already disturbed ground and conducting fresh exploration may proceed together. The advantage, moreover, of being able to secure men who have already worked under Mr. Gray's supervision is obvious, and some of those employed in this year's excavations would no doubt be available next year; continuity in their employment would undoubtedly save much trouble in training them to the work. The thorough investigation of this splendid monument is of the greatest importance, and it is to be hoped that adequate funds may be available.

THE AVEBURY EXCAVATIONS, 1909. By H. ST. GEORGE GRAY.

I. *Introductory Remarks.*

In the report of the excavations, 1908 (*Brit. Assoc. Reports*, 1908, pp. 401-13), an epitome was given of the existing archæological literature on Avebury, having reference to its stone circles, surrounding earthworks, and ancient remains in the immediate neighbourhood; and a summary representation of the opinions and observations of several authorities on Avebury, including Aubrey, Stukeley, Hoare, Crocker, W. C. Lukis, Fergusson, and the Revs. A. C. Smith and Bryan King, was also placed on brief record. In another section a condensed account was given dealing with previous and less extensive excavations which had been conducted in various parts of "the Temple" between 1865 and 1894; none of these, however, produced any definite evidence of date, for the reason, mainly, that scientific method in archæological fieldwork had not then attained to the standard aimed at in the present century.

Having dealt with Avebury under these headings in the previous report, the present account will be almost confined to the excavations conducted from Monday, April 26, to Monday, May 17, the filling-in, completed this year, continuing till May 20.

A maximum number of sixteen men was employed this season, eleven being engaged in 1908. The weather was highly favourable during the three weeks, only four hours being lost owing to rain. Last year we were much hindered by falls of silting from the almost vertical sides cut as the digging penetrated into the lower levels of the great fosse. But, having grown wiser, we left a considerable batter to the faces of the silting this season, at the expense, however, of uncovering a relatively shorter length of bottom of the fosse.

A number of sectional diagrams were made as the work proceeded, in which the various soils were indicated and the exact position of every object of importance found during the exploration was projected into these sections, notes being made relating to each numbered "find." Eleven sectional drawings and plans were made, and a scale map of the whole area excavated in 1908 and 1909. An average section of the southern fosse having been given in the Report of 1908, it will be unnecessary to publish another on the present occasion, the previous one being fairly representative of the other sections made for the sake of careful record and precision.

Twenty-two satisfactory photographs (half-plate) were taken during the season and sixteen last year, some showing the progress in the excavations from time to time as new features presented themselves, others being interesting views of various parts of "the Temple" taken under favourable conditions of light.

The excavations were visited by some of the members of the British Association Stone Circles Committee, by Fellows of the Society of Antiquaries, and members of the Wilts Archæological Society and Marlborough College Natural History Society.

Most of the excavations have now been filled in, but Cutting II. through the fosse has been left open for the inspection of visitors during the summer.

II. *Geological Note.*

Avebury is on the Middle Chalk, but Mr. A. J. Jukes-Browne, F.G.S., informs us that the area has not yet been accurately mapped, and it is uncertain whether the site stands on the *Terebratulina gracilis* zone or that of *Rhynchonella Cuvieri*. Of the fossils from the Avebury fosse, 1909, all are *Inoceramus mytiloides* except two, which are *Rhyn. Cuvieri*. Mr. Browne also reports that "the evident abundance of *Inoc. mytiloides* is greatly in favour of the zone of *Rhyn. Cuvieri*; they are seldom abundant in that of *Terebratulina*, which always consists of fairly soft white chalk, while that of *Rhyn. Cuvieri* is harder, more nodular, and often yellowish."

Iron pyrites were commonly found in the fosse cuttings.

III. *Excavations into the Fosse.*

(*a*) *Cutting I.*—Rather more than three-quarters of the silting from this cutting was re-excavated last year. It was 24 feet long, all the upper deposits down to the top of the Roman stratum being removed in 1908, and a length of 17 feet cleared at the bottom (*Report*, 1908, pp. 408-10). It remained, therefore, to uncover 7 feet on the E. margin this year. Roman pottery was found at depths of 5.7 and 6 feet respectively, and a human clavicle, depth 8.5 feet. The mixed silting was reached at a depth along the E. margin of 9.1 feet (the depth on the W. margin being 8.7 feet). After having penetrated the chalk rubble to a depth of 12 feet from the surface a large fall of several tons of material from the E. face had to be contended with, and, although the labour entailed thereby was considerable, the final results were satisfactory. Eventually the bottom along this margin was reached at a depth of 17.8 feet from the surface of the silting, and we were rewarded by finding, in all cases on the floor, four antler picks. Cutting I. produced in all (1908-9) parts of ten picks of red-deer antler and a shovel of shoulder-blade bone—implements which had been used in the original excavation of this huge fosse.

But the most interesting discovery on the floor was the chipped flint knife, a piece of flint full of sponge-spicules which appears to have been slightly scorched but never burned red-hot, and a piece of charcoal. The knife is not only of characteristic Neolithic type, but most probably of Neolithic date. It is of a kind frequently found on the site of an ancient factory of flint implements on Windmill Hill, about a mile to the north-west of Avebury.

(*b*) *Cutting II.*—This cutting was pegged out last year also to a length of 24 feet, the W. margin being 69 feet to the E. of the W. margin of Cutting I. Being nearer the road on higher ground, it was obvious there would be a greater amount of surface silting to remove than in Cutting I. Last year a length of 9.5 feet was dug to a depth of 5.5 feet, and in the re-excavated material were found a number of shards of Norman and mediæval pottery (*Report*, 1908, p. 410). It was at this point that we continued operations this year. The surface silting was found to extend to an average depth of 5.8 feet in the middle. Nothing worthy of particular record was found in it; but a number of shards of mediæval date and even later, together with an Irish halfpenny of George III. and a seventeenth-century tobacco-pipe of clay, bearing the name of "Thomas Hunt" on the heel, were collected from depths varying from 1 to 3 feet. Another tray of pottery of similar character was preserved from depths of from 2 to 4.5 feet, and other mediæval fragments were found along the

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E. margin of the cutting at depths between 4.5 and 5.8 feet. The upper deposits had probably been disturbed, and further inquiries led me to believe that the surface of this part of the fosse had been cultivated up to the third quarter of last century.

The next deposit—mixed silting, consisting of mould with a larger proportion of small pieces of chalk—extended to an average depth of 10.3 feet in the middle. The lower 2 feet of this silting was found to be of a finer kind with a smaller admixture of chalk.

Eight lots of Roman or Romano-British pottery were found in the mixed silting at depths varying from 5 feet to 8 feet. One piece was picked up at a depth of 8.5 feet, but it may have tumbled down during the digging. Several pieces of pottery of bronze age type were also found in the mixed silting at depths between 8.5 and 9.5 feet and above the pure chalk rubble. This pottery was of the soft smooth hand-made cinerary-urn type containing few grains of quartz; one piece has a typical cordon or encircling ridge. This deposit also produced human remains in two places to a maximum depth of 9 feet. Flint flakes were also found, and four objects of flint, including a good specimen of an oval scraper.

Between the mixed silting and the chalk rubble in the middle part of the silting, tapering in both directions, a seam of crystallised chalk, almost impenetrable to the pick-axe (indeed, it broke two points), was reached; it occurred at the same level in all the cuttings made. Carbonate of lime had consolidated the chalk and rendered it as solid as the hardest concrete to a thickness of 1 foot in places. The workmen considered it to be the bed of an ancient watercourse. In any case, there must have been a considerable soakage of water to deposit carbonate of lime in such quantity.

Owing to the curvature of the stratum in the silting, the chalk rubble on the sides of the fosse extended almost to the top; in the middle it was reached at a depth averaging 10 feet. From here to the bottom, as elsewhere, silted chalk rubble only had to be removed, with thin seams of dark mould caused by the occasional falls of turf. A piece of early British pottery was dug up at a depth of 8.7 feet near the southern margin of the fosse. No other pottery was discovered, but four pieces of worked flint were found at depths between 6.5 feet and 9.5 feet (none in the middle depths of the fosse).

The greater parts of two antler picks were found in deep positions, as described below. Six of these picks were recovered during the season. Since the Avebury Report, 1908, was written, explorations at Maumbury Rings, Dorchester (which I had the charge of), revealed a Neolithic shaft, 30 feet deep, in the solid chalk below the floor of the Roman arena, in which no less than nine antler picks were found, some being in good preservation, two having the smoothed grips like some of the examples from Avebury and the Grime's Graves. The Dorset County Museum contains parts of antler picks also from Jordan Hill, Fordington, Hambledon Hill, &c.

Close to the bottom of Cutting I. last year we found a fragmentary *scapula* in a shattered condition, its position, &c. (*Report*, 1908. p. 410), suggesting its use as a shovel of the character of those found in the Neolithic flint-workings at Cissbury, specimens from which may be seen in the British Museum and the Pitt-Rivers Museum at Oxford. A number of worked *scapulæ*, one being finely ornamented, were found in the Meare Lake Village. In the 1909 excavations at Avebury three well-defined specimens of these shovels were found in Cutting II. fosse, two shoulder-blades of ox (*Bos longifrons*) being found on the floor of the fosse at depths of 18.5 and 18.8 feet respectively; the other was a *scapula* probably of pig (*Sus scrofa*), found at a depth of 14.3 feet in the chalk rubble, having perhaps slipped down from the vallum before it became turf-clad. The two shovels of *scapulæ* of ox measure 13¾ inches and 12½ inches in length. In two cases the large anterior spine has been cut away, or partly removed, and from this fact and the worn appearance of the three specimens, together with the great scarcity of other animal remains, except the antler picks at such a great depth, we think it more than probable that they were used as shovels in the original excavation and clearing of the fosse.

The bottom of the fosse, Cutting II., was just as smooth as in Cutting I., but it narrowed slightly. In Cutting I. the width at the bottom varied from 16 to 17.3 feet. In the W. half of Cutting II. it varied from 11.8 to 17 feet; in the E. half it averaged 14.3 feet. The walls of the fosse in the lower parts (Cutting II.) became steeper and were very uneven, there being considerable projections of hard chalk left apparently for no particular purpose. We experienced no fall from the E. face of the silting, it being sloped as the excavation proceeded to the extent of 4½ feet out of the vertical. The bottom was found to rise towards the east slightly, and along the E. margin a ridge (height about 0.9 foot) of solid chalk crossed the fosse as shown in one of the sectional diagrams; in the middle of the ridge was a slight hollow. We could not, of course, ascertain whether this sudden slight rise continued in an easterly direction.

The depth of Cutting II. from the surface of the silting on the west was 18.8 feet; on the east 20.5 feet; the difference being accounted for from the fact that the surface rises considerably towards the road.

(*d*) *Cutting III.*—The E. margin of Cutting III. was only 6 feet W. of the middle of the western hedge bounding the modern road into Avebury from the south. A length of 14 feet of fosse was marked off for examination. It was close to the gate of the high road, and was dug to ascertain if the fosse rounded off to form a solid entrance-causeway.

Both Aubrey and Stukeley apparently show the position of the Kennet Avenue entrance into Avebury as being exactly on the site of the present road, and this fact rather led one to suppose that the fosse of the W. side of the solid entrance-causeway must have terminated in about the position of the present western hedge. But our excavation into the fosse of Cutting III. proved that their plans are incorrect and misleading.

In 1908 (*Report*, p. 410) we made several trial holes to ascertain the direction towards the east taken by the upper margins of the walls of the fosse exposed in Cutting II. Holes were made along both margins, and in all those nearest to Cutting II. the solid chalk upper border of the fosse-wall was revealed; but instead of the fosse narrowing it widened as it approached the hedge and road.

This year before re-excavating a part of Cutting III. we dug a trench about 32 feet long and 5 feet wide, connecting the northern face of Cutting II. with the northern face of Cutting III., and clearly exposed the upper walls of the fosse. On the top of the solid chalk "wall" in the N.N.E. corner of Cutting II. a slight platform was observed. It was found on excavation to continue a little towards the north, but judging (1) from the apparent hollows in the turf-clad inner bank for some little distance round, and (2) the fact that modern shards were found down to the solid chalk, it appeared evident that a recent excavation had been made here, perhaps for chalk, as in the much larger mutilation in the vallum opposite on the south.

Having re-excavated Cutting III. to a considerable depth we felt bound to complete the northern portion of it to the bottom, which the fine weather permitted us to do, but, as we shall see presently, we proved the existence and position of the ancient entrance-way on the E. side of the modern road.

It soon became clear in digging Cutting III. that the fosse approaching the causeway from the west not only maintained its great depth, but expanded considerably towards the point where it rounded off to form the causeway under what is now the high road into Avebury.

The top margin of the fosse in Cutting III. proved to be 52 feet wide, and the whole of the filling to a depth of 5 feet was removed. This produced no object of importance and consisted entirely of silt from the hedge and road and a loamy tenacious material said by the local people to have been brought to this spot from the site of the "New Bridge" across the Kennet stream on the Devizes road, quarter of a mile S.W. of our diggings, when it was built. It entailed much manual work to remove this "dumped" material, but afterwards we came upon the same ancient deposits as occurred in Cuttings I. and II., making "finds" of pottery and a well-worn flint scraper.

At length we reached the bottom at a depth of 23 feet from the surface, but nothing was found in the lowest depths but a *scapula* of sheep at 18 feet; and no remains actually on the smooth floor of the fosse, which was exposed for a width of 8 feet and a length averaging 3.8 feet. In no part of the excavations could one realise better the immensity of the great fosse and the labour its construction must have entailed when metals were unknown in Britain. This inner slope of Cutting III. was the finest example of cut chalk exposed in any part of the excavations; and the uniformity of the slope and the absence of projections seemed to indicate that the fosse was originally excavated with greater care near the entrance-causeway than elsewhere. The average inclination of the fosse wall was at an angle of 63½°, and covered a length of 26.5 feet on the slope; but the steepness of the profile in the lowest 6 feet was remarkable, being at an angle of 81°, the chalk resting in immense solid blocks in its natural condition. No ancient tool-marks were observable on the walls of the fosse, near the bottom or elsewhere.

(*To be concluded.*)

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THE BEHAVIOUR OF DUCTILE MATERIAL UNDER TORSIONAL STRAIN.

A PAPER was read by C. E. Larard, Assoc.M.Inst.C.E., M.I.Mech.E., before the British Association for the Advancement of Science at Winnipeg. The researches reported in this paper were carried out on different diameters of wrought iron, mild steel, and nickel steel, varying from half an inch to three inches. Some of the results obtained may be summarised as follows:—

1. For ductile material there is no well-marked yield-point similar to that obtained for tension tests.

2. When the maximum torque is reached failure takes place by the specimen commencing first to shear round the periphery over a small annulus of material, this shear gradually extending inwards from annulus to annulus at a reducing torque until the final fracture of a more or less central core in tension, accompanied by a loud report. This failure in two stages is brought about by the irregularity in the form of the fracture during shearing, whereby a wedging action is set up over the large annulus surrounding the core, thus producing compression across the annulus and tension in the core. The diameter of the tension core is roughly proportional to the diameter of the specimen. For a homogeneous material the relationship between torque and local twist is given by a rectangular hyperbolic curve.

3. The torque twist curve throughout the entire test, from the elastic limit to the breaking torque, follows a compound interest law, and an expression has been obtained by means of which the work to destroy the specimen can be calculated; and the result has been confirmed by integrating by means of a planimeter the autographic torque-twist diagram.

4. For a homogeneous material the work done is proportional to the volume, whatever the diameters and lengths of the specimens.

5. For a homogeneous material the torque at fracture is directly proportional to the cube of the diameter of the specimen, when the diameter varies.

6. (*a*) Principal transverse sections by planes at right-angles to the axis before twisting remain plane during twisting. (*b*) The unitary structural parts of the material at different radii in a given section undergo during torsion the same angular displacement. (*c*) Straight generating lines on the cylindrical surfaces before torsion are twisted up into helical lines, defining lines of helical shear. (*d*) Any sector of a homogeneous cylinder is twisted up so as to form a sectorial screw. (*e*) The shear stress at any radius and also along the helical lines may be calculated from the usual shaft formula. (*f*) For a homogeneous material the angle of the helical lines of shear tends to have a constant value for any diameter of a specimen; consequently simple mathematical relationships between the variables of the experiments may be obtained.

7. A specimen under torsion undergoes changes in its dimensions, there being an axial elongation following the compound interest law and a small reduction in diameter. Further, it would appear that when work is done in producing plastic deformation with corresponding increase in elastic resilience the volume is slightly increased.

8. The elastic limit and the elastic resilience of material may be raised above the primary limit, which is purely an artificial one produced by manufacturing operations, by (*a*) overstraining, with full recovery of elasticity to a higher limit by heat treatment at low temperatures. (*b*) By indefinitely long rest after overstraining. (*c*) By continuous stressing of material at a fairly constant load above the primary elastic limit. (*d*) In manufacturers' works by scientific straining with subsequent heat treatment. (*e*) Considering the forms of iron and steel, by the addition of a small percentage of some other element. Any one of these methods increases the ratio of elastic limit to maximum load, and the ratio of elastic resilience to the total work which has to be done on the specimen to destroy it. That is to say, the useful "play" energy for practical working stresses may be increased in some cases with resulting economy of material.

9. A comparison of the results of the tests on wrought iron and steel shows the great superiority of steel as compared with wrought iron for shafting.

10. The author, in conclusion, drafted a specification for torsion tests based on the results of the experiments given.

The Date for sending in designs for a college at Hull for the training of teachers for elementary schools has been extended from October 11 to October 18.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* has an article on "Fireproof Houses" by Mr. Frederick Squires, but these houses are really only less combustible than the ordinary "frame house," which has long been the normal type for the smaller suburban house or country cottage. The construction advocated is terra-cotta tile with a minimum of concrete. The illustrations comprise a number of small houses designed by Messrs. Squires & Wynkoop, which are examples of "fireproof houses," but although sometimes suggestive are not very remarkable.

La Construction Moderne illustrates the designs that have this year obtained the first and second awards in the students' competition for the Grand Prix de Rome, the blue riband of the French architectural student. An exhibited drawing from the Salon is also reproduced, the subject being a purely academic one—a triumphal bridge designed by M. Maurice Durand. A series of articles is commenced on how to draw perspectives with a home-made trammel, avoiding vanishing points and other troublesome features of the routine method.

Deutsche Bauzeitung has an interesting article, with illustrations, on the Mediæval town of Cordes, in Southern France. The restored Diana Well in Hildesheim is also illustrated. There is an article descriptive and explanatory of the new police regulations for the planning and building of theatres in Berlin.

Dekorative Kunst gives us a description with illustrations of some modern German cemeteries, in which the inherent ghastliness of the wilderness of monuments in the older type is masked by extensive tree-planting. The most successful of these seems to be the Ohlsdorfer Cemetery at Hamburg. Another and more cheerful article describes and illustrates the interior decoration and fittings of the Bodensee steamship *Friedrichshafen*. A pleasant change from the normal flat residence is a one-family house in Hanover, designed by Karl Hubert Ross, which is full of piquant internal effects.

Moderne Bauformen, *à propos* of the Düsseldorf exhibition of Christian art, gives us a purview of modern ecclesiastical architecture, of which the examples are not confined to German lands, but include some of the work of Henry Wilson, Nicholson & Corlette, Walter Crane, and Bentley & Marshall, the last being of recently added fittings for the Westminster Cathedral.

The *Scientific American* gives a short account, with some striking illustrations, of the excavations at Delos carried on since 1903 by the French School of Athens.

Construction has an interesting illustrated article on "Bonds, Mortar, Joints, Colours and Patterns" of brickwork which is eminently suggestive of the variety of texture that can be given to brick walling by thoughtful originality.

NOTABILIA.

THE *Art Journal* contains an original etching by E. Marsden Wilson, A.R.E., of Didcot Church, which is a charming presentment of a small but picturesque building. A. L. Baldry contributes another of his instructive articles on "The Treatment of Drapery in Sculpture," with fine illustrations from both ancient and modern work. An interesting article on "Coffers, Chests and Caskets," by Luther Hooper, deals with Egyptian, Greek and Roman examples, and is to be continued.

The *Journal of the Royal Society of Antiquaries of Ireland* has a "pioneer" paper on "Dublin Harpsichord and Pianoforte Makers of the Eighteenth Century," by W. H. Grattan Flood, Mus.D. The productions of the musical-instrument makers of Dublin in the eighteenth century are not only interesting from a musical point of view, but also from the artistic. The illustrations to J. S. Fleming's article, "Irish and Scottish Castles and Keeps Contrasted," bring out the picturesqueness common to both.

GENERAL.

Mr. Charles John Holmes, M.A., Slade Professor of Fine Arts at Oxford, has been appointed director of the National Portrait Gallery in the place of Mr. Lionel Cust, M.V.O., who has been obliged to retire for reasons of health. Mr. Holmes is forty-one years of age, and for the past five years has acted as editor of the *Burlington Magazine*. He is also an occasional exhibitor of landscape subjects.

A Water-Colour Drawing by Turner entitled "The Falls of the Clyde" has been presented to the municipal collection at Liverpool as a memorial of the long connection of Mr. R. D. Holt with the local arts committee. In consequence of the overcrowding of the Walker Art Gallery a sub-committee was appointed last week to consider in detail and to prepare a scheme for the enlargement of the gallery.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, September 11.

Architectural Association: Camera and Sketching Club, Visit to Guildford and district.

Society of Architects: Sketching Party to Rochester.

Northern Architectural Association: Visit to the Romano-British city of Corstopitum.

Monday, September 13.

National Association of Master House Painters and Decorators Annual Meeting opens at Sheffield.

Tuesday, September 14.

National Association of Master House Painters and Decorators: Exhibition opens at Sheffield. Lecture by Sir W. B. Richmond, R.A., "House Decoration for the Masses."

Saturday, September 25.

Institution of County and Municipal Engineers: Eastern District Meeting at Lincoln.

Monday, September 27.

Architectural Association: School of Architecture, Winter Term begins.

COMPETITION DRAWINGS FOR NEW OFFICES, BERKSHIRE COUNTY COUNCIL.

THE competition for proposed new county offices and committee rooms, &c., for the Berkshire County Council has proved unusually attractive, no less than 177 sets of drawings having been submitted. It is difficult to account for this rush unless it be that proximity to London has induced many young architects in the metropolis to try for a job near home and to neglect a larger one at Burslem, where there were only twenty-three designs sent in, and several of these alternatives. True, one guinea only was asked for particulars instead of the two at Burslem, and the name of the assessor was announced beforehand.

A very large number of good designs have been submitted, and though there can be no doubt of the superiority of the design by Messrs. WARWICK & HALL, placed first, despite some obvious minor defects, the assessor must have had considerable difficulty in selecting the other two that he considered worthy of a premium, and in our opinion has not been entirely successful, although we are willing to grant that he would devote more time to the consideration of the eligible competitors than we are able to do. Still in a closely fought competition much depends in the making of the award on the method by which an assessor decides superiority, and the methods adopted by various assessors are not all alike. It is highly probable that had the competition been assessed by another architect, shall we say more experienced in the judging of competitions, the result might have been different as regards the second and third places.

Strictly speaking several of the competitors ought to have been disqualified for violating the instructions, the most frequent infringements being the use of tinted or toned paper for mounts and the colouring of the half-inch detail.

There may probably be some discussion as to whether the selected architects have not infringed the conditions by arranging their bicycle store, coal store and packing room so that access from without is only possible by the use of Messrs. SUTTON'S private road. The question on this point raised by competitors reads:—"38. Is space between building lines to be a joint private road?" and the answer was, "No, this land belongs to Messrs. SUTTON & SONS." Most of the competitors have understood this to mean that the County Council and its staff would not be allowed the use of Messrs. SUTTON'S private road, but although the Council have no right, it is quite possible that the courtesy and generosity with which Messrs. SUTTON have treated the County Council in respect of the site might be extended to the use of their private road by officials, though not by the public. Messrs. WARWICK & HALL have evidently staked their chance of success on this further courtesy, and apparently justifiably. Thus when this point is carefully considered we cannot see that the winners have really violated the instructions of the competition.

Messrs. WARWICK & HALL have a delightfully simple plan, with a central entrance and direct corridor 6 feet wide leading therefrom. At right angles to this from about the centre is a corridor on the ground floor that communicates with the Assize Court, and off it is the staircase with lift running the whole height of the building. This staircase hall is sufficiently well lighted from an internal area, although only 9 feet wide. This area lights besides the stair and corridor, lavatories and store-room, and on the first and second floor offices for building inspector and the County Treasurer's chief clerk, who will scarcely have more light than they want. On the ground floor Messrs. WARWICK & HALL have located the Clerk's Department, the general office being at the end of the central corridor at the rear of the site, so that the public on entering have its door immediately facing them. The Clerk of the Peace and the assistant solicitor have their rooms to the front with the second assistant and the waiting room adjoining. The rooms of this department at the rear of the building and in connection with the general office are:—The chief clerk, second general office, typewriting room and store room. Well arranged between the principals and the clerical section of the department is a committee room, its doorway directly facing the corridor leading from the Council entrance from the Assize Court. Thus a plan effective in its interior architectural effect and conveniently arranged is obtained.

On the first floor is the Education Secretary's Department, arranged on a similar principle to that adopted on the ground floor, with committee room centrally placed between the officials and clerical staff. Minor accommodation overflows from this department, which requires more superficial area than any other, on to other floors, spare room, sun printing, store and packing rooms. On the second floor are accommodated the Medical Officer's Department, County Treasurer's Department and the Land Steward's Department. On the third floor are placed the County Surveyor's Department and the caretaker's quarters. Messrs. WARWICK & HALL have not considered it necessary to give the caretaker access to his rooms other than by the main staircase and lift.

In their external treatment the authors of the winning design have wisely not attempted to follow in any way, except in a maintenance of the chief horizontal lines, the design of the Assize Courts, but have designed a building thoroughly in consonance with the atmosphere of old Reading. A very clever piece of design is the one-storey colonnaded portico, the plan of which is admirably effective, both externally and internally. One commendable point in which Messrs. WARWICK & HALL excel almost every other competitor is that they have not built the back part shabby, but have treated their south and west elevations quite as architecturally, if not quite so expensively, as their front to The Forbury. This is not only æsthetically correct but is a delicate compliment to Messrs. SUTTON, as if the

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architects would say, "You have been very good to our clients and so we will give you something pretty to look at." Most of the other competitors show elevations that are absolutely brutal in their callous indifference to the outlook of Messrs. SUTTON and their customers.

Coming to the design awarded the second premium, that by Mr. E. J. SHREWSBURY, we cannot help thinking that this was selected by the assessor amongst the three from which the final choice was to be made by himself and two members of the Council as coadjutors, to enable him to present a strong case in favour of what is undoubtedly the best plan submitted in the competition. The governing idea of this plan is best seen on the first floor, where the centre of the site is occupied by a lavatory block on either side of which is a small area 10 feet by 14 feet. The staircase flanks one of these, and around this group is a continuous corridor 5 feet wide, and surrounding this are the offices. The two small areas mentioned are not considered sufficient by the author, so he has a third 9 feet by 15 feet on second floor, and 9 feet by 7 feet on the ground floor. The main entrance is in the centre of the principal façade and opens immediately upon the principal staircase and lift, and from this on the several floors access is obtained. Thus the directness of the first premiated design is lacking. The external architectural treatment of this design is confined to the front elevation, and though good in its general composition is somewhat weak in the treatment of the entrance. Thus the plans of the first and second designs show two distinct principles, that of the first a straight central corridor, that of the second a central open court with circumscribing corridor, a sort of "here we go round the mulberry bush" arrangement, and nearly all competitors follow one or other of these types.

Messrs. WILLS & ANDERSON, the authors of the third premiated design, have placed their main entrance at one end of the principal front, leading to a hall or glorified corridor, 10 feet wide, from which opens the principal staircase, semicircular on plan, with the secondary stair leading to the caretaker's rooms adjoining. These are both lighted from a single central area, around which on three sides is a corridor 6 feet wide, off which open the various rooms. As in the second premiated design this arrangement of plan rather suggests going "round the mulberry bush," especially as the general offices of each department, to which of course the public need most frequent access, are impartially placed, so that it does not much matter which way visitors turn, as they will in either case have about the same distance to go, that is as far as possible from the stair and lift. In this respect the second premiated design is better, for the general offices are close to the stair. Messrs. WILLS & ANDERSON have a fairly successful elevation to The Forbury, but their other fronts are void of architectural design. This competition has not been the occasion of one of the best efforts of Messrs. WILLS & ANDERSON, and the merits of their design are still further obscured by very unfortunate colouring.

To notice, far less to criticise, all the remaining 174 designs would be more than our space would permit, but there are some that we cannot pass over, and we may as well say at once some of them in our opinion are superior to either the second or third premiated designs. We do not profess to place these in order of merit but take them haphazard as they are hung.

No. 73 has a plan of the corridor round an area type, but more direct and satisfactory than those premiated. The elevation is unfortunate in composition with a richly treated projecting pavilion on one side only of a symmetrical disposition, of which the entrance forms the centre. In detail the design is good.

No. 37 has a plan somewhat on the lines of the first premiated, but with two branch corridors from the main one, a good plan but not quite equal to the best. The front elevation and detail are excellent, though not reminiscent particularly of Reading.

No. 39 again follows the type of the winner, but a slight variation in the planning of staircase and the secondary corridor, which in this case is needed on first and second floors, renders the plan less direct and compact. The elevation to this design is quiet and refined, but would have been improved if the end pier pilasters had been carried down through the ground floor.

No. 97 is another variant on the selected type, but the secondary corridors being more extensive bring it nearly to the "mulberry bush" type. This is distinctly one of the good plans submitted and is accompanied by a powerful elevation and detail.

No. 88, with a central entrance, has managed to combine the principal features of the two typical plans, and on the first floor, but there only, has the continuous circumscribing corridor. The elevation is fair and not too municipal, but lacks the interest that a *pianta nobile* would give. The first-floor windows are right in detail, but not in scale to make them dominant.

No. 5 is a good example of the application of the winners' type. Compactness is gained by the avoidance of internal corridors to rooms of the same department, some of which are therefore necessarily corridor rooms. For example, in the County Treasurer's Department the assistant clerk cannot reach his room without going through the chief clerk's room or the general office. This is a method of planning public offices that many have followed. Apparently it saves corridors, but really the ostensible area of the rooms is diminished by the space left free for the through traffic. The elevation is quiet and refined, but suffers from a lack of principality in any floor of the four and the too great importance of the attic.

It is of course difficult in designing the elevation for a block of offices to give the greater importance to one floor, qua *pianta nobile*, that a satisfactory composition demands, and when, as in most designs, there are four floors the difficulty is increased. Some competitors have managed to provide the accommodation required on three floors above the basement, and these generally have the most satisfactory elevations, for it is easy to give enhanced height to the windows of the first floor and to pinch a little those of the second floor. Others have tried the device of a giant order, but that has produced designs usually of too important a character for the purpose of the building, for which somewhat of a domestic feeling appears to be the most suitable, or at least a compromise between stately domesticity and municipal grandeur.

No. 170 has managed by a development of the principle of self-contained departments, with rooms *en suite*, to produce a very compact plan on his first and second floor, and thus reduce the height of his building to three storeys above the basement instead of the four that most other competitors have found necessary. This, as we have explained, makes easier the design of the front, and a very satisfactory and excellent composition results.

No. 83 has taken the bold step of making his entrance to the new building in the part of the Assize Courts available for re-use with a new porch and vestibule. The result is by no means unsuccessful, although there is a somewhat wasteful arrangement of internal hall with galleries on upper floors which it must be admitted would give excellent interior effect. The elevation does not attempt to be too municipal, and suggests a dignified domestic building quite suitable for County Council offices.

No. 135 is another design whose plan is similar to that of the winner, and is quite an architectural plan, workable and internally effective. The elevation is distinctly good and the detail excellent, but almost too good for the size and importance of the building, which indeed looks to be part of a larger scheme rather than a complete entity.

No. 134 follows the selected type, and like most others of this type produces a good plan. The elevation is one of the best attempts submitted to harmonise with the existing Assize Courts without copying their design or detail.

No. 107 also follows the selected design in type of plan, but has minor faults in detail which detract from its excellence. Like many others the desire to utilise the "rooms available" in the old building has rather spoilt the plan.

No. 139 boldly refronts part of the Assize Court and makes his entrance in the re-entering angle between the new and old building. The working out of the idea leads to the lighting of a very large proportion—say quite one-third—of the offices from an internal area 27 feet by

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20 feet. The elevation and detail are distinctly good, but would be improved by greater height to the first-floor windows and less to the second.

No. 69 has a central entrance leading to a corridor around a central area, an example of the "mulberry bush" type, but has a good elevation and detail.

No. 34 has a good plan with central entrance and corridor, following the type of the winning design, and one of the best elevations in the competition, an instance of the superiority in this respect of the three-storeyed front.

No. 144 is remarkable in plan as being free from any internal area, a central corridor with another at right angles being lighted from an ample staircase on an external wall. The elevation is good, but would have been better with the omission of the balcony to the first-floor windows, as this detracts from the principality that their height would otherwise have given them.

No. 70 is compact in plan with little apparent corridor and no internal area, merits obtained in part by the *en suite* arrangement of the departments, with the consequent thoroughfare rooms. The author of this design sends a very good detail drawing.

No. 66 is another plan with its entrance from the Assize Court building, and is quite a successful development of the idea. In this plan also the several departments are individually planned *en suite*. This design includes a good eighteenth-century semi-domestic type of elevation.

No. 75 is an example of the type of plan followed by the second premiated competitor, but the "general" offices and porter are rather out of the way.

No. 1 has a nice detail drawing of an originally treated adaptation of the Greek Doric as a giant order of engaged columns, but the plan is not worthy of the elevation.

No. 104 is a good instance of the central-corridor type of plan with semicircular stair off it, and is accompanied by a well-drawn detail.

No. 82 has the entrance at the side leading to a corridor around a central court, which on the ground floor is occupied by offices top lighted. The elevation is rather effective, with an excellent detail drawing, but would be better without the ventilating flèche, which is hugely out of scale with and crushes the detail of the front.

No. 165 was surely worthy of a premium. The main feature of the plan is a central hall with a light well in the middle and a gallery around with the stair off it. The elevation and detail are both good. Perhaps this design was disqualified because it has a mount that is not white.

We shall illustrate Messrs. WARWICK & HALL'S design next week.

NOTES AND COMMENTS.

IN the decision of Mr. VEREY, Official Receiver, on the case of HAWKINS *v.* The KING, there occur some important points as to the liability attaching to contractors in connection with work contracted for with Government departments. The question raised in this case was whether the plaintiffs, Messrs. HAWKINS, who under contract with the War Department carried out work that appears to have necessitated "extraordinary traffic," were liable to indemnify the Crown against claims made by the highways authorities for the "extraordinary traffic" and its damage to the roads. The learned Official Referee found that the contractor was "liable to the Crown for the amount of every claim made by a local authority upon the War Office (whether covered by a certificate or not, provided that a certificate could be got, and that there was at the date of the claim time to get it) so far as the items therein represented money expended by the authority in repairing damage done by extraordinary traffic caused by the contractor in the execution of that contract within twelve months before such claim was made, or under a contract either still in course of execution at the date of the claim, or which had terminated so far as it was capable of causing damage to roads within six months before the claim."

THE writer in the *Cornhill Magazine* whose lament that "with the death of WREN architecture begins its old age," and that the eighteenth century marks the growth of decadence due to eclecticism as opposed to the influence of tradition, appears to be scarcely cognisant of the fact that architecture to-day, as always, reflects the spirit of the times. He complains that "architecture has become the slave of fashion and an anarchy of taste has succeeded the long reign of tradition." That is to say, architects to-day do not design exactly on the lines their fathers followed, but start their inventions from some other basis, now Gothic, now Greek, now some phase of Renaissance, and follow the fashion set up by some leader of the moment. Perfectly true; and does not this reflect what is going on in other departments of national life? Not to rely for an argument upon the variations of costume, particularly women's costume, which has ever been the field of quickly changing fashions, do we not find violent changes of fashion a feature of modern life in our amusements? Ping-pong, tennis, croquet, rinking, diabolo, are for a time the universal rage till displaced in popularity by some other temporary craze. Similarly in dramatic entertainments, there is now a vogue for one form, now for another. In literature now one author and then another is the popular favourite. If the author of the article really appreciated the trend of our modern architecture, he would know that at no period in the history of English architecture was there greater virility and a higher level of achievement than at the present day.

LORD ALDENHAM in the *Great Western Railway Magazine* has been lamenting the dispersal of the interior architectural features of the old Jacobean House, No. 47 Lime Street, London, the "Compting House" of the GIBBS family, which he would have been glad to purchase and to incorporate in his house at Aldenham, only unfortunately he spoke a little too late. There does not seem to be much, however, to be regretted on this score in the hall of the Worshipful Company of Cordwainers, erected in 1788, and now being demolished to make way for a new building designed by Mr. HOWARD CHATFEILD CLARKE. The fine modern stained-glass window to the memory of JOHN CAME is to be preserved and incorporated in the new building.

THE difficulties of local authorities in dealing with low grade not to say unhealthy houses are illustrated by a case just decided at the Liverpool Police Court. In Liverpool, as stated by the medical officer, Dr. E. W. HOPE, there are thousands of houses unfit for habitation, but the housing committee are not at present in a position to deal with them all by demolition and reconstruction. Now comes the difficulty, Are these insanitary houses to be left till the finances of the city can bear the cost incident to their rebuilding? It might be possible to close them all by magisterial order, but where are the displaced inhabitants to go? In the case just decided a number of houses were condemned by a closing order in May last. The owners have reduced the number and carried out certain works to the remainder. They then applied for the determination of the closing order, and this was opposed by the Corporation on the ground that the houses did not yet come up to the standard required by the authorities, but the medical officer was obliged to admit that as the Corporation were not prepared to provide housing accommodation they felt they must allow the tenements in question to be inhabited. Under these circumstances the magistrate felt he could no longer rule that the closing order should remain in force. We all desire that the poorest should be healthily housed, but there are so many considerations to be borne in mind that counsels of perfection may readily inflict great hardship not only on landlords but on tenants, and therefore the Augean stable cannot be cleansed in a day.

EXTENSIVE additions to the building of the Glasgow School of Art have enabled the managers on the opening yesterday of the sixty-eighth session of the school to make a considerable development of its work in the adequate provision of lecture-rooms and studios for subjects previously suffering from lack of adequate accommodation. A joint course of instruction in architecture is

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given in the School of Art and in the Technical College, and the joint classes form the Glasgow School of Architecture, the work of which during its five years of existence is admirably justified by the high standard of achievement reached by those who have been fortunate enough to share its advantages. Artistically Glasgow is one of the most remarkable cities of the Empire for the ability of its architects and especially of its younger men.

THE restoration by Commendatore BONI of one of the footpaths beneath the Arch of Constantine to its original level gives an opportunity once again of seeing the monument in its original proportions. In the course of the work of excavation the subterranean exits of the *Meta Sudans* have been discovered. The rescue of the relics of Imperial Rome and Italy from the accumulations of ages is a work in which Commendatore BONI has achieved most valuable results, and it is to be hoped that he may long be able to continue what he has so well begun.

ARCHITECTURE: ITS TRUE PRINCIPLES.—XVIII.

By R. OWEN ALLSOP.

THE RECTANGULAR BASE.

A GREAT point about the rectangular mass as a groundwork is that it forms a frame for the better setting-off of forms less severe. The use of rigid rectangularity in general mass gives greatest scope to perspective effects, especially to colonnades and the like. It possesses the majesty of the sheer cliff, that is lacking in more broken composition. The rectangle forms a base for square attached secondary masses or wings as transepts, giving the full contrasting value to the meeting of two planes at right angles and the light-and-shade effects. It is to be noted that all arises naturally from the rectangular plan which in itself is best suited for practical service, giving the room with right-angle corners. One main, more or less central and dominating rectangular block, in the spirit (if not actually arranged after the manner) of a cathedral nave, forms the most fitting base for axial, monumental planning. It ensures a fine main-roof mass. A building even of small dimensions, arranged as a plain rectangle composition, will always show well among neighbours wanting in unity of massing by reason of the purposeless breaking up of main lines of such. Any kind of magnificent effect can be given to the severe, plain, right-angled building, as may be seen in any country affording fine specimens of the architect's art. It is a good start, if not an absolutely necessary one, as a building of poor body and large wings immediately suggests subdivision and want of unity, such as one sees in the broken-up institution with its wards and pavilions. It is fortunate for city architecture that the sheer, plain, square wall based on a straight line is the most effective of building backgrounds (so to speak); or city architecture would be in a more hopeless condition than at present, where the only scope is a flat façade flanked by neighbours' party walls.

It must seem therefore a law in architectural design that some dominant mass is required as a basis of composition, and that this mass should preferably arise from a strictly rectangular plan, hence becoming of itself of necessity rectangular in form, for, as we have ventured to suggest before, two-thirds of architectural design must be referable to the plan. Given this prime mass of effective and imposing squareness (in the sense of right-angled corners), we can add on wings, pavilions, enhance the centre, vary the methods of flanking, mark out parts by special massing, and so endeavour, as an ulterior motive, to render the whole *one building* as distinct from a hospital-like collection of architectural units. Herein lies the great interest and problem, and the greatest difficulty, and probably one of the least studied attributes of present-day architectural design.

The effect of rectangular mass is to enhance the value of cylindrical ones, as plainly shown in sharp perspective views of St. Paul's, and perhaps observable in fig. 40.

The form of the crystal results from law. It is curious that the only suggestion of anything like the solid forms that are the base of universally admired buildings are to be found in crystals of various primitive varieties of matter. The cube, the parallelopiped, the prism, the pyramid on various bases, the tetrahedron, octahedron—the elementary geometrical solids, are exact counterparts of the forms best suited to obtaining dignity and grandeur in main architectural masses. A half crystal of a chemical compound gives the geometric form of the top of Sompting Tower. Many of the elements (the components of *matter* which is the material of the builder) give more varied geometrical figures. The whole are distinguished by those definite axes and planes of symmetry that we

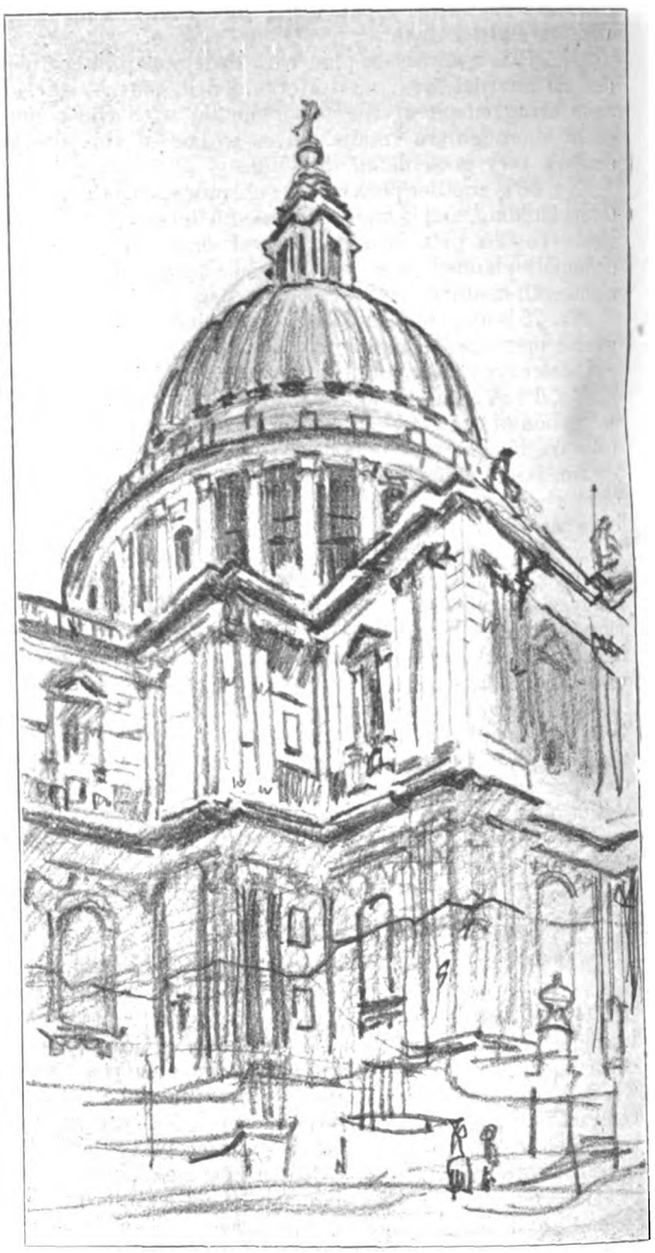


FIG. 40.—ST. PAUL'S.

have suggested must be found in all imposing architectural compositions.

This is a curious fact, leading to curious reflections. Nowhere in creation (except in the domain of crystals) is there suggestion of pure architectural form. We may take suggestions for imposing grouping from mountains, for majestic, sheer, vertical walls from the cliff and precipice, for columns from tree trunks, and for coursing from the stratification of rocks; while certain natural stone formation closely resembles actual grouped piers and moulded columns. There is no suggestion of elementary architecture found in the beaver's hut or even the wigwam of the savage. We look in vain for anything in the

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vegetable world—beyond the column's trunk, which is moreover referring only to mere architectural detail. Leaves and flowers suggest symmetry and balance, and the animal world the value of one symmetrical part and the little importance—if not actual wrongfulness—of symmetrical sides or flanks. But from a selection of natural crystals dressed only by splitting on their natural lines of cleavage, we can quite easily construct a model of the main masses of any rectangular building that ever has been erected that has a high degree of architectural merit according to the universal judgment of enlightened persons. A plain, cubical mass surmounted by a prism is the beginning and end of the mass-outline of the Parthenon, ignoring of course columnar construction and projecting details, and constructing a geometrical figure by vertical planes bisecting the columns and utilising the prism for the roof planes and the triangular forms of the tympana. From such a consideration we can at once see that all attempts to construct effect of mass outline on the fretwork or wedding-cake or vase principle, must be diametrically opposed to sound principles of architectural composition and grandeur of effect. Such fretwork design can only become suitable in towers that rise out of a main composition and are seen clearly all round, as for example the Antwerp spire.

It may give to some a sense of humiliation to refer all architectural mass-form to the apparently insignificant world of crystals. A little consideration will show that this is a wrong view. The cause of the crystal is law. The end of the law is order. It is surely ennobling to work under law.

The last words of a great and good man* "all right—*all under rule*," express the true spirit of a noble worker. The laws that bring about the crystal formation were laid before the foundation of the world, and to compare crystals with architecture, is only, after all, another way of stating the fact that all architecture is based on geometrical principles—founded that is to say on eternal truths alike binding and controlling the chemical atoms and the planet in its course.

Moreover, this line of argument is justified for other reasons. The artist deals with the representation of life and the sculptor likewise; the architect models inert matter, and there is no life in the building any more than in the rock. It therefore seems unreasonable to look for hints and suggestions into the living world of plants and animals. If we deal with lifeless matter, and essay to produce a real or apparent sense of order from so-called chaotic (or what we may term the sublime) system of order—humanly called "disorder"—we do well to inquire into the question of the proportions and characteristics of the elements that comprise that which is generally classed as "matter."

Order, as we understand it, principally consists of a process of selection, whereby like things are aggregated. In the chemical processes necessary to the "sorting" of the separate elements, we find that the purified elemental substance naturally—that is, by law—arranges itself into a definite, geometrical, solid shape or form of three dimensions—as an accurately arranged stack of correctly-shaped bricks, or as a pile of round-shot arranged in the most compact formation. The then exhibited attributes are—definite shape, geometrical basis, mathematical ratio, axis and plane of symmetry.

All these properties are equally found to be the root-cause of noble architectural design—man's mind impressed on matter for definite ends and purposes.

(To be continued.)

The King's Norton Education Committee are about to erect a secondary school, and proposed to mark the occasion by a stone-laying ceremony. The Worcester county authorities have strongly discouraged the idea. They are to be asked to reconsider their decision in view of the importance of gaining all possible publicity for the school.

* Charles Kingsley.

TOWN PLANNING.*

THE advent of the Town-Planning Bill opens up a vista of reform and social progress of the very first importance.

It is a true saying that we are creatures of environment, but it is none the less true that we may, if we so desire, be the creators of our environment. Unfortunately in the immediate past opportunities for this have come to but very few, and to these without reference to ability or desire to take advantage of the opportunities conferred.

The creation of civic environment must not be allowed any longer to be regarded as a matter entirely of individual interest; it must be recognised rather as a matter of public responsibility.

In the Town-Planning Bill we have the first of what I hope will be a series of Bills directed to securing public control of environment. I may appear optimistic in saying so, but I feel that this Bill, if wisely directed and skilfully handled in its operation, can be made to exert an influence not only on the physical but also on the moral and intellectual life of the community, of a nature more real and more direct than any other measure of reform that has been placed on the Statute Books during recent years.

But to proceed to a criticism of the Bill. Several clauses call for especial attention. In drawing up the Bill there is evidence that the intention has been not so much to frame a set of conditions so definite as to exactly meet every exception and contingency that may be met with in its operation, as to leave very much to the discretion of the officials responsible for its direction: a wise course where there are wise officials. It is of the utmost importance that the positions occupied by these officials be well filled. I refer in particular to the officials in the offices of the Local Government Board.

In clause 55 the Local Government Board may make regulations which shall provide according to the Fifth Schedule, restrictions, whenever circumstances so require, on the number of buildings which may be erected on each acre, and the height and character of the buildings.

How in this practice this will be interpreted remains to be seen, but it is to be hoped that the following observations will be taken into consideration:—

That in determining the character of the buildings to go on to a certain site, whether the word character be interpreted as class, meaning factory, public office, residence or shop; or whether it be interpreted as having reference only to effect; it be borne in mind by those whose duty it will be to decide this point, that the ways in which one building or class of buildings may be detrimental to others are not confined to a few practical considerations such as rights of light, lines of frontage, &c., nor even to such considerations as would come under the head of public nuisances as those fitted to contain noisy machinery, those designed to carry on objectionable businesses, or those erected for the purpose of manufacture in the process of which are emitted an excess of smoke or noxious and pungent smells. All such may very obviously and easily bring about the ruin of a neighbourhood in a very short space of time. But besides these there are also other classes of objectionable property which on the ground of being objectionable in character ought just as certainly to be ruled out. I mean buildings which are offensive to the sense of sight; and amongst these I would without hesitation class the interminable terrace of speculating builders' design; all buildings obviously designed as advertisements, and intruding either as irregular monstrosities in form, as vicious exhibitions of colour, or as vulgar expressions of other kinds. I am aware that the result of such an interpretation might cause individual suppression, but at the same time I feel sure that individual expression at such an expense is less worth while. Let us hope that the word character will cover all this.

Again, may those who interpret the Act use discretion in enforcing restrictions on the heights of buildings. An unwise jurisdiction over heights of buildings to be erected even over one acre, may produce a scientific yard-measure sort of result quite incompatible with the varying character of the sites provided even on so small an area as one acre.

But to revert from the Town-Planning Bill to the preparation of suburban town plans. Here there are many points which should be kept in mind at the outset. First, areas for operation will have to be decided upon, and much will depend on the outline of the area selected. The outline of the areas which form the boundaries of many of our garden suburbs are very unfortunate as having no connection with

* A paper by Professor S. D. Adshead, School of Civic Design, Liverpool University, read at the National Town Planning Congress.

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natural surroundings. In outlining areas for town planning the boundary should always be influenced by some natural or historic line of demarcation, as a watercourse, an old road, or the edge of a wood. Outlines which follow ridges or centres or valleys, should be avoided as these should form the centres of the divisional lay out.

The area for operation having been decided upon, the next consideration is the class of property to be erected thereon. This should be influenced by the result of a well-considered sociological survey of the whole city, which to my mind should in all cases be prepared by every town before commencing to make town plans. Such a survey would ensure each zone or district having a well-considered reference to the whole. In Germany the statistician assists largely in the preparation of the town plan. I presume that his duties are of a sociological nature, so that we have precedence in Germany for such procedure.

It would be inopportune to discuss all the considerations which are likely to govern the distribution of population about a town, but looking at the subject broadly, two alternatives are clearly presented. The first would delegate areas to distinct and separate uses, there would be residential areas for different classes and industrial areas for different industries. The second would create centres of interest at chosen points, and about each centre would be clustered dwellings for all classes, with such public buildings and business premises as immediate convenience dictated a need for. Judging from tendencies in modern civic extension it is clear that the latter alternative is generally the one which should receive our first consideration.

Glancing at the sociological growth of our larger cities it is clear that this has ever been the tendency, and a tendency which has had excellent results. Each outlying district has grown more and more to depend upon itself for immediate resource. Note how London has formed itself into separate boroughs, how Kensington, Brixton and Chelsea has each become an important shopping centre, has its suburban theatre, its library and its town hall. The same tendency may be seen in the suburbs of Liverpool, Manchester, and other provincial towns, though in a less obvious way; and so the mother city is continually throwing off fresh seedlings in her sporadic growth. It is for us to see that these are favourably planted and are supplied at the outset with all the essentials of individual existence. Each subsidiary centre would have its church, its public hall, its almshouse, its school, its shops and village green. I do not say all these, but what in modern suburban existence corresponds to such. The civic centre, the public buildings, the stations for tram and train, the theatre, the library, the club, the shops, the school. Close around these, and each with its garden, and in close proximity to a park or place of recreation, would be the dwellings of the workers. These clustering about the suburban centre would be judiciously arranged to occupy the back lands. As the one or two main roads which would radiate or circumscribe the city drew away from the suburban centres they would be aligned with the villa residences of the middle classes. Such residences would need to conform to a more formal treatment of elevation and surrounding than would be expected in the dwellings of the poor and working class, and further out, occupying the intermediate spaces, and generally well elevated between each suburban centre would be the dwellings of the rich, where stately mansions, formal in treatment, and surrounded with extensive grounds would give breathing space and form points of interest amidst the verdant richness of the suburban landscape.

The advantage of such a suburban lay out would be that it would prevent the possibility of one class of property encroaching upon and spoiling another. Individually separated, yet placed in juxtaposition, the classes could most favourably assist one another. The rich are necessary to the poor, the educated to the uneducated, the refined to the vulgar. Mutual assistance would breed organised citizenship, and diversity of interest would lead to practical attainment.

Such a general sketch would never be absolute in its concrete expression. Other factors of a geographical and historic character such as pronounced natural configuration, old roads, rivers, valleys and historic centres will react on any system, also questions involved in the realisation of special interests such as those of sport, art and recreation; these definitely separate a class.

In this country most suburban centres are already well marked out, but in their development some such well-organised system as the above must be kept in view. In planning the future of an existing town, not only is it necessary to consider the laying-out of fresh tracts of country but much thought and energy must be devoted to the destruction and abolition of what already exists. I refer in particular to slum property of any class, and also to the hideous railway encroachments, which in a money-making age have cut up the approaches to the city in a most disastrous way. The former can only be regarded for the time being as vacant land, held on a fixed but limited tenure, the length of tenure depending upon the supply of cheap land available in the vicinity. To obtain cheap land we must have improved and rapid communication so as to swell the market, induce competition, and so bring down the cost. Given an unlimited supply of easily accessible and cheap land the work of the speculating builder is doomed. When land is comparatively cheap, and not less than ten cottages are erected to the acre, the money invested in bricks and mortar compared with that invested in land is out of all proportion greater; so that the interest on the investment when taking into consideration the added improvement of a garden and general aspect is practically in favour of ten cottages to the acre, and not forty; and not only should it be immediately greater, but it would be more secure, so much so, that I prophesy that in the near future landowners will not grant leases to the speculative builder subject to the erection of property of the hideous terrace class; and so useless and decimated will that class of property become that eventually in the interests of ownership it will be found absolutely necessary to pull it down.

Our second object of attack will be the unsightly and wastefully disposed railway approach. It is deplorable that most of our large towns and many of our smaller ones should be gashed, hacked, and divided asunder by hideous embankments, or systems of arches penetrating to the very heart of the city. Such must eventually be demolished and replaced as regards main trunks where it is essential that they come into a town, by cuttings immediately under the surface of the road, or in the case of lines which penetrate and circumscribe the centre of the city, by deep laid tubes.

In conclusion let me dwell for one moment on the units of the suburb. First we have the cottage, the dwelling of the working class. Let this be a cottage in the best sense of the word, the embodiment of a simple life, its garden planted with old-world plants and bushes, and its apartments furnished every one for use. Avoid the association of Italian ever-greens, monkey puzzle trees and exotic cultures of every kind. Speaking generally these have no place here, nor has the brick fence, the asphalte path, nor the iron gate. I need say no more. We in England possess a wealth of tradition in this respect incomparable with what is to be found elsewhere throughout the world.

Let our cottages be approached by grass bordered paths, and let the roads be the simplest of well-kept tracks.

For the residence of the middle-class I would advocate a more formal and refined type of architecture than is at present usually associated with the residence of this class. I rather feel that the usual middle class residence savours too much of the glorified cottage; there should be a distinction, the manners of the middle class surely call for something more refined than the brick hearth, the open beam ceiling, the bull's eye glazing, and rustic stair. This aping of the cottage is unfair to the lower class. Without laying down any hard and fast rule, may I direct attention to the formal middle class residences of some fifty to a hundred years ago, a time when refinement of manners, scholarship and good taste attained to a very high standard amongst those responsible for building development?

In the future the houses of the rich will necessarily be in great variety of taste. Isolated, and not forming part of a scheme, each will be a scheme in itself; and not only as an incident in the landscape will they affect the town plan.

The actual system or fashion of plotting out the roads in the suburban plan will depend upon the character and style of the architecture which dominates the scheme. There are varied styles in planning roads as there are styles in architecture. Each must complement the other. The rustic cottage aligns a rustic road, and a rustic road depends on the irregular but picturesque arrangement of trees, banks and contours for the interest which it evokes.

The formal dwelling must align a formal road, which again depends for its interest on its avenue of trees, its formal gateways and garden fences, its well-kept side-walks, its regularly placed lamp standards, its seats and other furnishings.

These are some of the general principles which should control the suburban plan, but the suburb is not the only part of a town requiring attention. The Town-Planning Bill emphasises its importance at the present moment, but like America, we have need very shortly to look to our civic centres, for it is only here that architecture can fully attain the proud position she holds as mistress of the arts.

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SNAP-SHOT DRAWING FOR ENGINEERS AND ARCHITECTS.

AMONG the lectures arranged to be read at the Congress Hall, Imperial International Exhibition, White City, on Saturday last ("Engineering Day"), was one by Mr. T. R. Ablett, founder and art director of the Royal Drawing Society, entitled "Snap-shot Drawing for Engineers and Architects." In the course of his remarks he said it has come to the knowledge of the Council of the Royal Drawing Society that in various branches of technical drawing, such as that of practical mapping, botany, zoology, geology, war, surgery, architecture, engineering and other constructional drawing, students with undeveloped pictorial imagination have extreme difficulty in realising the natural pictorial aspect of the objects represented by such technical delineation. The Council has therefore made special efforts to develop practical imagination through the realisation of the natural pictorial aspect at first solely as "The Art of Childhood," for the veriest baby delights in it, and later as a necessary auxiliary to other kinds of drawing which are not as readily invented by the young people themselves. To facilitate the early acquirement of all kinds of drawing the Council has made their scope and relationship clearer by lay or popular definition, analysis, explanation, and also by reproductions.

General Definition of Drawing.—Drawing is the process of producing by human efforts certain markings of a descriptive nature to serve as records and convey information in connection with pictorial, mathematical, diagrammatic and decorative work.

Analysis of Drawing.—1. The most important branches:—Pictorial drawing represents the appearance of objects observed by means of converging rays of light; mathematical drawing represents the imaginary observation of objects by parallel rays of light. The latter describes the facts of the three dimensions in connection with practical, plane and solid geometry as dealt with in the mathematics and other branches of general education, and which forms the basis of constructional drawing as used by engineers, architects and many other workers. It is by working these together judiciously that the precious gift of practical imagination is developed. 2. Subsidiary branches.—Subsidiary branches are found in diagrammatic and decorative drawing.

The Unbiassed Observer.—Practical imagination develops well in such unbiassed observers as are assisted in their early efforts without being interfered with.

The born artist is an unbiassed observer reflecting his environment by self-invented delineation according to the measure of his intelligence, and every intelligent child with good, serviceable eyes is to this extent a born artist. A picture is the embodiment in form and colour of an idea formed in the mind of the artist from, and based on, his observation of nature. The more realistic a picture, the more useful for scientific purposes, and realism is founded on the most expert use of the eye as an optical instrument. This self-invented delineation by the unbiassed observer is called common-sense drawing, and is the method of becoming expert by experiment.

Reproductions of the "snap-shot drawings" by young unbiassed observers were shown by lantern-slides of sheaves, umbrella, human nature study, value of structure to the artist, animal machinery, man's machinery, Achill Island.

The youthful unbiassed observer, judiciously handled, comes early to skill in pictorial drawing, and he first makes acquaintance with mathematical drawing in connection with geography. In general education all sorts of plans have been tried to found the mathematical drawing of geography on its pictorial appreciation, which through early neglect is generally found very rudimentary in the young as well as the teacher.

It is well known that the youth of the country, especially the boys, have a passion for the study of engines, steamships and other forms of machinery. The Royal Drawing Society desires engineers to help the Society in giving them correct information about these machines, so that those who come to be the engineers of the future may have that most useful of all faculties, "practical imagination."

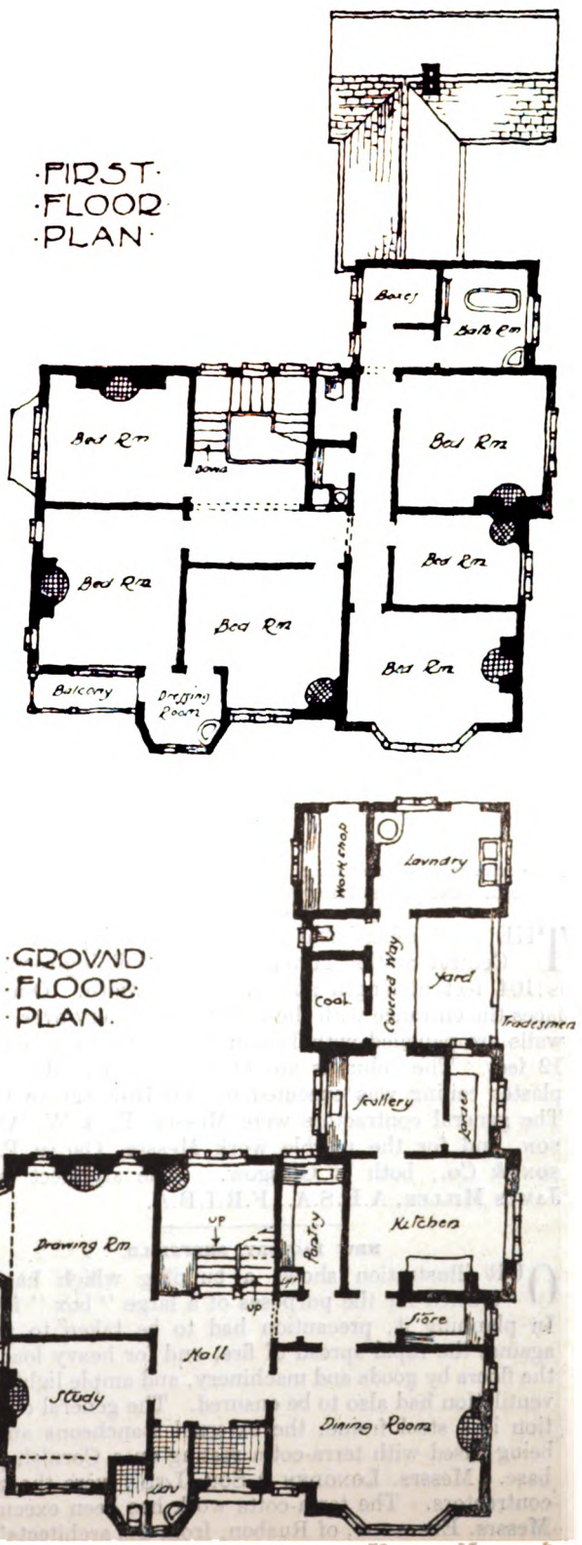
An eminent engineer lately said that when any draughtsman had a difficulty in his drawing office he was told to draw the look or perspective view of the object, and this generally got over the trouble.

The "snap-shot drawing" of perspective appearance is of use to engineers as well as to many other observers.

ILLUSTRATIONS.

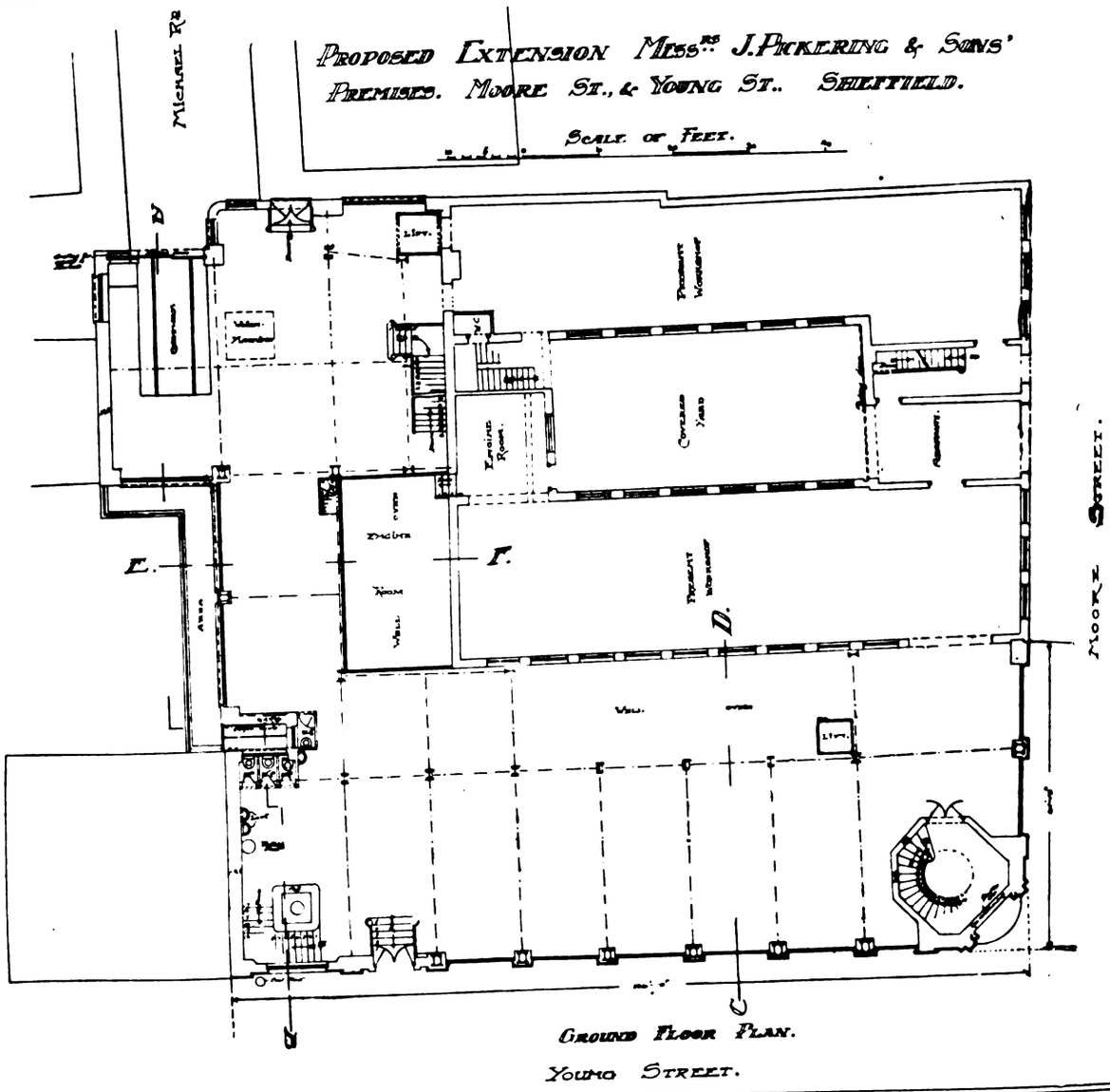
HOUSE, GAYTON, CHESHIRE.

THIS residence is situated on the Cheshire side of the river Dee, on the Glegg estate. The site is considerably elevated, giving an extensive view of the river and the Welsh hills. The main aspect faces south, and commands a fine view of Gayton Hall and woods. The materials are brown roof tiles, fine grit stucco with brick



base, oak half timbering and Cefn stone dressings. Oak is principally used for the interior woodwork. Messrs. WM. FLEMING & Co., of Neston, were the general contractors, and Messrs. APPLEYARD & QUIGGIN, A.R.I.B.A., of Liverpool, were the architects.

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THE CENTRAL STATION HOTEL, GLASGOW.—THE LARGE DINING-ROOM.

THE most remarkable of the recent additions to the Central Station Hotel is the large dining-room. It is 104 feet in length and 47 feet in width. Our view faces the entrance with the musicians' gallery over. The walls are panelled with Italian walnut up to a height of 12 feet. The columns are of Pavonazzo marble. The plaster ceiling was executed by the Bromsgrove Guild. The general contractors were Messrs. P. & W. ANDERSON, and for the marble work Messrs. OSCAR PATERSON & Co., both of Glasgow. The architect is Mr. JAMES MILLER, A.R.S.A., F.R.I.B.A.

NEW FACTORY, SHEFFIELD.

OUR illustration shows a building which has been erected for the purposes of a large "box" factory. In planning it, precaution had to be taken to provide against the rapid spread of fire, and for heavy loading of the floors by goods and machinery, and ample lighting and ventilation had also to be ensured. The general construction is a steel frame, the external stancheons and bays being cased with terra-cotta resting on a Cornish granite base. Messrs. LONGDEN & SON, LTD., were the general contractors. The terra-cotta work has been executed by Messrs. EDWARDS, of Ruabon, from the architects' drawings. Messrs. HADEN & SONS are responsible for the heating and ventilation on the "Reck" system. The constructional steelwork was carried out by Messrs. DORMAN, LONG & Co., in consultation with Messrs. READE, JACKSON & PARRY, engineers. The architects were Messrs. C. & C. M. HADFIELD, of Cairns Chambers, 19 St. James's Street, Sheffield.

A FACADE IN KINGSWAY, LONDON.

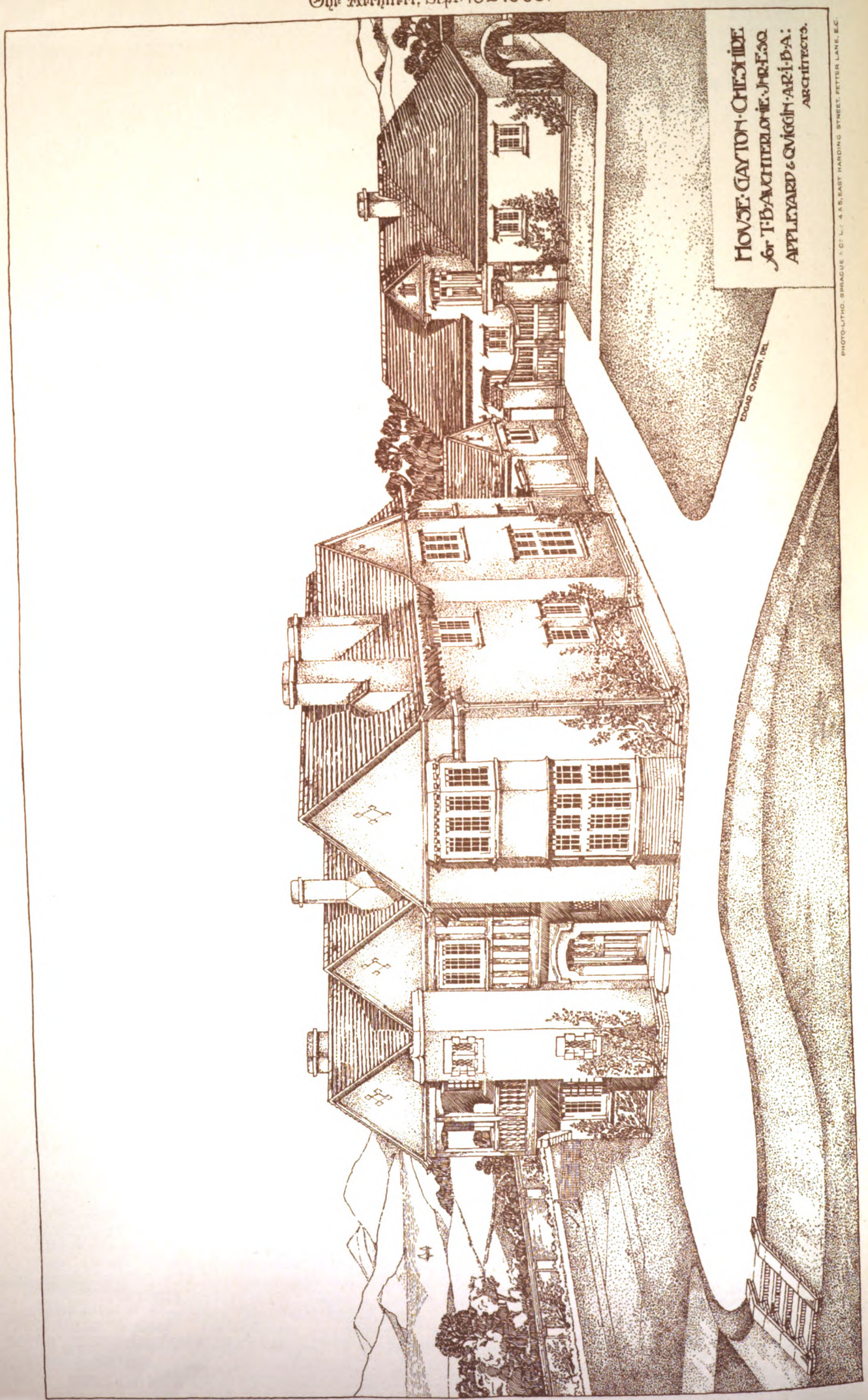
THIS is one of the few buildings as yet erected on the east side, and is built on land formerly partly occupied by the back buildings of 63 Lincoln's Inn Fields. Thus a good site was obtained for an extensive block of offices, for which Messrs. PILDITCH & Co. prepared the plans and Mr. EDWIN L. LUTYENS designed the elevation and the artistic elements of the interior. As is required invariably by the London County Council for work in Kingsway, this façade is carried out in Portland stone. The drawing from which our illustration is taken was exhibited this year in the Royal Academy.

A Meeting of the subscribers of the Perth City and County Royal Infirmary was held on Monday for the purpose of considering a report and sketch plan of the proposed new infirmary. The directors recommended to the subscribers the adoption of a site 11 acres in extent at Western Avenue, Glasgow Road, and this was agreed to. Some time ago Mr. James Miller, F.R.I.B.A., Glasgow, was instructed to prepare a sketch plan as to how this ground might be utilised. In his report he said the buildings would consist of wards with accommodation for 120 beds, with the administrative block in the centre and the kitchen, offices, and laundry, &c., behind. Each portion of the building is detached. Mr. Miller points out that if one of the north ward blocks were omitted meantime a saving of 3,000*l.* would be effected, making a total cost of 33,800*l.*, in which case the total accommodation would be reduced to 94 beds. In preparing the estimate strict attention had been given to economy as regards materials, methods of construction, and architectural design. The directors will now take such further action as they see fit to mature the scheme of the new infirmary, and to report further to the annual meeting of the institution to be held in February next.

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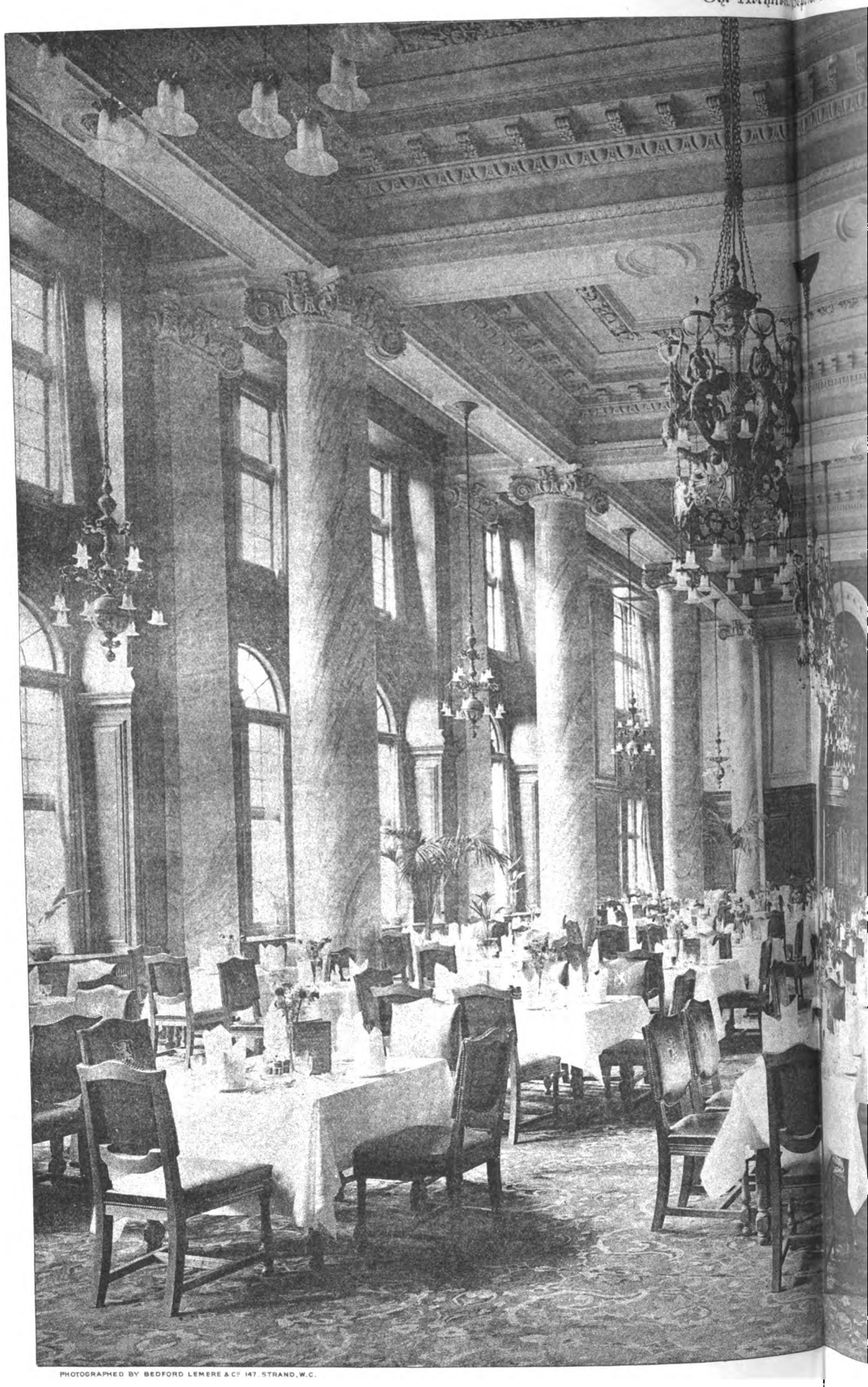
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HOUSE: GAYTON · CHESHIRE
for THE RIGHT HON. LADY HESKETH
APPLEYARD & GARDNER
Architects

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PHOTOGRAPHED BY BEDFORD LEMERE & Co 147, STRAND, W.C.

THE CENTRAL STATION HOTEL, GLASGOW: THE
JAMES MILLER, [illegible] Architect

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The Intercept. 10th 1909.



INK PHOTO SPRAGUE & C° LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

TATION HOUSE, ROW: THE LARGE DINING ROOM.
JAMES [illegible], Architect.

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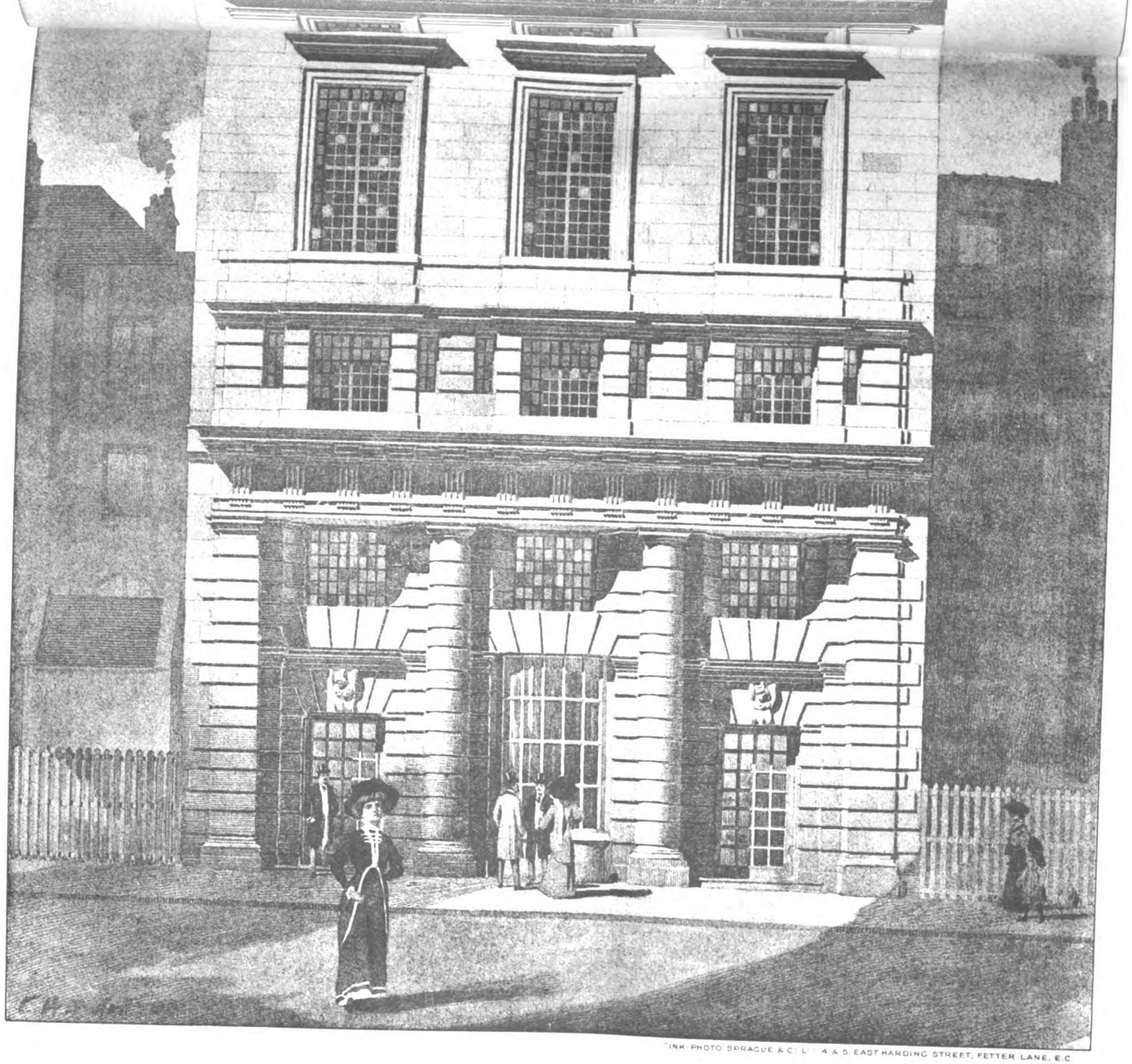
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A FACADE IN KINGSWAY.



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TINK-PHOTO SPRAGUE & C° LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

A Façade in Kingsway, London.

EDWIN L. LUTYENS, F.R.I.B.A., Architect.

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PHOTO BY THOS. LEWIS, STRATFORD ROAD, BIRMINGHAM

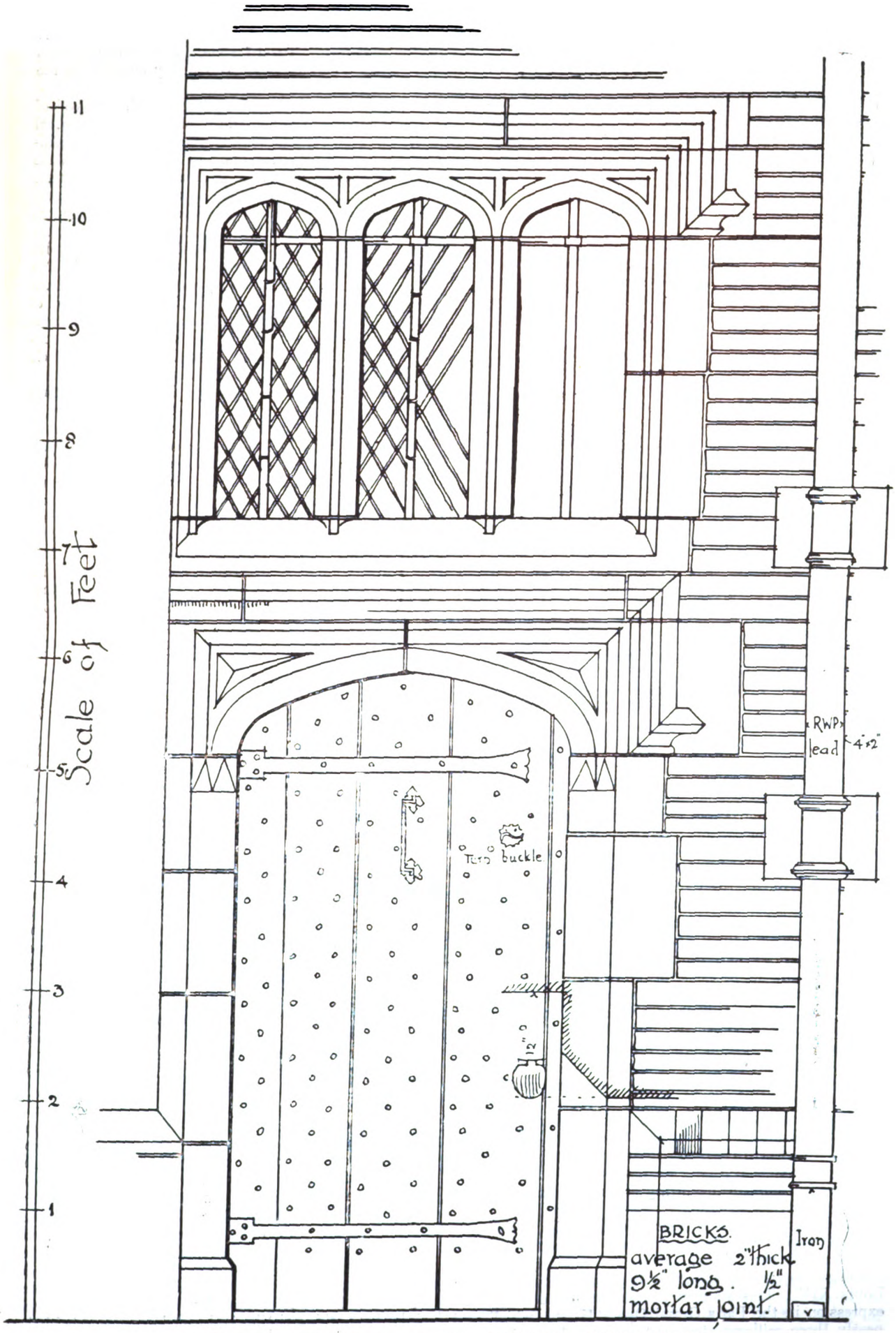
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NEW FACTORY, SHEFFIELD

Messrs. HADFIELD & HADFIELD, Architects

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DOORWAY IN SOUTH FRONT, COMPTON WYNYATES, WARWICKSHIRE.

MEASURED AND DRAWN BY BANISTER FLETCHER.

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MODERN STYLE.

By LAURENCE HARVEY, Geneva.

GERMANY, France, and Italy are studded with new, queer-looking buildings, where fancy abounds and common sense seems to be absent. When asked what is the style of these buildings, the answer is given by Germans, Frenchmen, and Italians with the English words, "Modern Style." English has been adopted for this new architectural style, just as it is adopted all over the world for sport. Everywhere people speak of "bookmakers," lawn tennis (pronounced by Frenchmen "*lane tes nièces*," just as English sailors have made Leghorn out of Livorno), croquet, and football. In French towns you will hear even young roughs say to one another, "Allons jouer au football." The English title, "Modern Style," enjoys the same honours. Why? In England, as well as in the rest of Europe, up to 1880 architects were guided by the idea of reviving or using ancient historical styles of architecture. In France, under the reign of the first Emperor NAPOLEON, the aim was to imitate ancient Rome. Hence the colossal triumphal arch of the Etoile and the smaller one of the Carrousel. Hence also the building of a temple of fame surrounded with a colonnade of Corinthian columns. It is now used as a church under the name of Eglise de la Madeleine. For the Ministry of Foreign Affairs an immense palace was erected along the Seine on the lines of the Colosseum of Rome, with the three storeys of arches and columns one above another. Evidently the great French Emperor wished to suggest by his public works on Roman precedents that he was himself a successor of the ancient Roman emperors. In private dwellings Roman architecture could hardly be adapted, and architects were content with repeating the different forms of the Renaissance which were developed in France. Reaction against the too great playfulness of the architecture inspired by the free and easy ladies of the Court of LOUIS XV. was the cause of the severe yet elegant style of building created in Paris under the reign of the unfortunate king LOUIS XVI. Windows became devoid of all mouldings, and depended for their effect solely on harmonious proportions. Sculptured ornamentation was scarce, but placed with much taste where it could give point and interest to the building. This style was continued in a somewhat heavy fashion in the architecture for private residences and houses to be let in flats during the reign of NAPOLEON I. and the succeeding reigns up to LOUIS PHILIPPE, or, say up to 1848. With NAPOLEON III. architecture began to flourish again. Innovations were tried in different directions. Engineering began to make itself felt in architecture. The Central Markets of Paris were constructed entirely of iron, and offer the most successful example of iron architecture, for the Paris markets are not only convenient, but are really works of beauty. Archæology had also its say. Several eminent architects endeavoured to design modern buildings in the spirit in which ancient Greek artists would have worked if they had been living in our times, in the presence of our actual requirements. Such was the origin of the Bibliothèque Ste. Geneviève near the Panthéon, the new Law Courts facing the Pont Neuf, the reading-room of the public library in the Rue Richelieu, and of several other monuments of an equally distinguished character. They were really innovations in architecture, for the aim of the authors of these great works of art was not to copy the motives or the details left by the Greeks, but to be inspired with their spirit. In both the Bibliothèque Ste Geneviève and in the National Library iron work is freely used, undisguised, for the authors believed that if Greek artists were living now they would never think of disguising either their materials or their means of construction.

Gradually the Court of NAPOLEON III., ally of England in the Crimean War, intimate friend of Queen VICTORIA and Prince ALBERT, became more and more magnificent, and began to vie with the great displays of luxury of even LOUIS XIV. This state of things has found its artistic expression in the Paris Grand Opera House, which cost nearly three millions sterling to erect. It reminds one of the architecture of the great monarch who built the Palace of Versailles, but it differs therefrom by a liveliness of outline and a striking self-advertisement of form and colour which reflect the life of our modern democracy. Altogether the Paris Opera House was a most original building, but it did not start a new style of architecture. As to the so-called "Modern Style," it is about ten years old in France, and that is all we can say about it for the present.

In Germany the last century began with a revival of Greek architecture in Berlin and in Munich. This revival consisted in copying and adapting Greek details of architecture to modern requirements. In Berlin this was done with singular taste by an artist of the name SCHINKEL. He had caught the picturesque spirit of many a Greek building or group of buildings. Can there be anything more fanciful and picturesque than the group of small fanes called the Erechtheum, with the small gallery of caryatides placed in one corner and dedicated to PANDROSE? The Propylæa must have been also picturesque and far from severely symmetrical. One of the best known of SCHINKEL'S works is the Old Museum of Berlin; another is the Theater, of elegant outline, but spoilt by conventionality and sameness of details. Munich is a vast receptacle of copies from all kinds of buildings.

Dresden possessed several examples of German interpretation of the French Louis XV. style, and SEMPER, in about 1840, designed for it a kind of refined Roman architecture for its Museum and its Opera House. The Opera House was, in fact, as much as possible on the lines of a Roman theatre, such as the Theatre of Marcellus, with a circular façade surrounding the house. This Opera House was burnt down, and another was erected in its place from the designs of the same architect SEMPER, but on totally different lines. The general scheme was that advocated by the great composer RICHARD WAGNER. The now existing Opera House is surely more original in character than the former, and perhaps more practical and comfortable, but it is, we believe, far less harmonious.

Although Austria has been kicked out of the German Empire, we may fairly consider Vienna as one of the German artistic centres. It is German, but very materially modified in spirit by the numerous races of men of which Vienna is the capital. Here men in whose veins flow Italian, Czek, Hungarian, Slave, and other oriental races, even Turks, are at home, and therefore Viennese art has a suppleness, an adaptability to all tastes which one would vainly look for in purer German regions. Vienna creates objects full of taste, to which there are no precedents. We all know Vienna chairs, so elegant, so light, yet unbreakable, thanks to the use of wood curved by steam. In architecture Viennese art creates works in all styles. Greek architecture is used with much cleverness in some of the largest public works, and to Viennese art must be attributed that jewel of Greek art applied to a modern building, the Academy at Athens. Gothic, inspired by the splendid cathedral of St. Stephen, has found also clever adaptations in several public buildings. Then SEMPER of Dresden was called upon to work out his ideas in Vienna, where by the construction of two museums and a theatre he produced an *ensemble* of monuments to be compared to the ancient Forum of Rome. At the present time "Modern Style" of a certain kind is all the fashion in Vienna.

In Italy, after the establishment of the Italian Government in Rome, public and private works were started on a large scale. Like all buildings in Italy, they were of large proportions, but in every other particular most commonplace—mere unintelligent copying of old work. Yet genius abounds in that country. In Turin, the ancient residence of the Italian Royal Family, was erected the so-called Mole Antonellianum, one of the highest buildings in Europe, some feet higher than the cupola of St. Peter's at Rome. It is a marvel of constructive ability; the whole seems carried on apparently thin walls and gracile piers, yet is so stable that even the earthquakes that have done some damage to other buildings of Turin have not affected this one. It might be quoted as an example of a modern style, for nothing similar had ever been attempted before, but it remains unique of its kind, as nobody has ever attempted since to vie with the great work of ANTONELLI,

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and he himself died before the completion of his building. It seems that in this work a new principle of construction has been adopted, and that the elasticity of materials plays a great part in the structure, the whole being built of carefully selected bricks. Iron appears also to have been used not as a support, but as ties in the brickwork to counteract thrusts. At all events, this building is too scientific to ever become a popular model for architects, and had no chance of being the starting-point of a modern style. Rome is the political capital of Italy, but for wealth and go Milan far surpasses it. The gallery Victor Emmanuel, a kind of Burlington Arcade of immense dimensions, has served as a model to others in several parts of the world. Although novel in its general conception, it uses simply Classic architecture for its walls, and exhibits in its roof bold iron arches which are to be found elsewhere. Some of the new houses which surround the Castle are magnificent by their colossal dimensions and by the costliness of workmanship. They remind one of the Palace Strozzi at Florence, with its diamond-headed stone facings; but with this difference, that in Milan the entire building is faced with granite, exhibiting every kind of surface from the roughest hewn block to the most polished mouldings, and producing thereby most piquant and harmonious contrasts. The freedom is very near to what we call "Modern Style," still it remains well fixed to moorings of the past. Florence has too great a past to ever think of changing it for anything new, and Venice possesses an architecture so fanciful that our "Modern Style" falls flat by the side of it.

In England the noble and the wealthy have been brought up for centuries in the worship of Greek language, literature, and art by the University of Oxford. The lesson has been pushed home by the delivery of great plums in the form of headmasterships worth a thousand pounds a year and upwards, by exceptional good livings in the Church, and even by bishoprics at ten thousand a year to those happy scholars who had been eminent in the manufacture of Greek verses. The veneration for everything Greek has filtered down to the masses, and it has come to pass that translations of HOMER were found in shopkeepers' hands, and some sayings such as "When Greek meets Greek, then comes the tug-of-war," have passed into the common language of even the lower orders. Favoured by this state of public opinion, when STUART and REVETT at the end of the eighteenth century went to Athens and brought back measured drawings of all its principal remains, their work met with great success. Architects began immediately to dip therein to find architectural features for the buildings they had to erect for their aristocratic clients. The reasoning for this kind of employment of Greek features was simply this: everything Greek is perfect. If we produce a building made up of Greek features, this building made up of perfect parts will be, of course, perfect. Hence the numerous mansions in Belgravia and elsewhere with Greek porticos, some Ionic, some Doric, some of prehistoric heaviness, like those of the Temple of Paestum, forming a most amazing jumble of grand monumental features and everyday practical objects such as windows 12 feet high and several storeys, a jumble of which present architects feel somewhat ashamed when showing these mansions to strangers. But the acme of ridiculous unfitness of architectural features is shown when Greek styles are used in building Christian Church of England churches, such as St. Pancras and St. Philip's Chapel, Regent Street. In the former on each side are porticos supported by caryatides, exact copies of the Temple of Pandrose. If these marble ladies could think, they would wonder what service they rendered to the Church, or in what way they were connected with the Christian religion. Equally absurd is the delicate Ionic portico at the entrance, crushed by the tower immediately behind it. In the chapel in Regent Street we have the Choragic Monument known under the name of Lantern of Demosthenes doing service as clock tower above the entrance, to the intense amusement of foreign artists and the painful disgust of all men of taste.

Sir CHARLES BARRY introduced an architectural model to follow, much more in keeping with modern requirements, when he designed the Reform Club and the Travellers' Club in Pall Mall. Both are derived from the famous Palazzo Farnese in Rome. In our opinion Sir CHARLES BARRY's works are superior to their model, and exhibit perfectly good taste and fitness for their purpose. There is nothing redundant or useless in this architecture. It consists in plain walls pierced by doorway and windows. The windows are simply framed with mouldings and crowned with cornices useful for their protection. The whole building is crowned by one rich cornice. The beauty of such architecture depends entirely on the harmony of proportions in every part and detail. But to be effective it must deal with lofty rooms ranging from 24 to 30 feet from floor to ceiling. In private dwellings such as one has in London, that architecture is apt to look very tame and uninteresting. Here the Gothic Revival has rendered greater services than the so-called Classic styles.

It is, in our opinion, the adoption and practice of the Gothic style in all its branches that has at last given England the lead in art. For there is no doubting it. Paris is no more the centre towards which artists look, but it is London. What is called Classic architecture is founded on Roman architecture, even when adopting Greek details as in the church of St. Pancras. Roman architecture is based on false principles. It separates construction and decoration in two different operations. The structure is one thing which may exist without decoration; the decoration is another thing which may cover the structure as with a mantle, hiding it behind its folds. This decoration, conceived apart from the requirements of construction or convenience, was based on geometrical regularity of recurring parts, and being therefore deficient in suppleness tyrannically governed the whole building, so that convenience had often to give way to the cast-iron scheme of decoration. In Classic architecture windows of similar size and decorative importance may light a hall, a closet, or a staircase. Symmetry, *i.e.* the exact repetition of the same features right and left of the centre, is usually insisted upon whether these parts serve inside for similar uses or for very different ones. Kitchens may be made to balance salons or libraries. Some public buildings can accommodate themselves to the exigencies of the Classic style. It is perhaps best of all applied to barracks. But for private dwellings such as we have in England, where everyone lives in his own house, the Classic styles spell artistic death.

Gothic architecture does not mean what the public has long believed, viz. a certain form of window or of roof. It means simply that construction and decoration form one inseparable whole. An observation will make this clear. All over the Continent you will see the façades of the finest houses disfigured by the rainwater pipes. These come down from the roof in front of the wall, wherever wanted, and cut through cornices and strings most ruthlessly until they reach the ground. They are painful eyesores; but people through habit take no notice of them. This exhibits the failure of Classic architecture when the necessities of structure cannot bend themselves to its ideas of decoration. On the other hand, we remember a simple London jerry-builder who wanted to build a pretty villa using the following device. He placed his water pipes at the outside angles of the house so as to appear as so many delicate ornamental shafts. This builder was, in this instance, putting into practice the true principles of Gothic architecture without knowing it. But architects for a long time limited their revival of Gothic architecture to its outward forms, and to certain structural schemes which were dependent on the requirements of the Middle Ages, and on its means of construction. For instance, small materials were usually used in the Middle Ages, because deficient roads and means of conveyance did not allow of any other. Small panes of glass were also used because large ones could not be made. In copying these features of the old Gothic remains, architects were doing good work in the domain of archæology, but their efforts, as long as the spirit of Gothic art had not been grasped, were bound to end in death.

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Happily, London offers problems to solve in which traditional architecture, be it Classic or Gothic, is bound to break down. In the narrow lanes of the City where wealthy merchants have their counting-houses, the getting of the greatest amount possible of light was of paramount importance. This had to be done through window space, for electric lighting had not yet been invented. Through the use of iron stanchions and girders the façades were changed into one vast expanse of glass, where the walls were reduced to the piers which divided one house from the other. Even the breast between the floor and the window-sill disappeared; a counter ran along the windows, and the space under the counter was added to the ceiling of the floor below. Merchants required the adoption of these structural devices, and yet wished that their warehouses should have a striking architectural appearance. Hence came all kinds of odd architectural devices, some clever based on Gothic principles, some based on no principles whatever, except that of adopting traditional architectural features wherever feasible. These went under the name of the Queen Anne style. The Queen Anne style had hardly any models to follow, for what remains of that period is very little, and that belonging to mediocre buildings. Thus the "soi-disant" revival of Queen Anne architecture was the starting-point of the liberation of architects from all precedents. At first it gave rise to fantastic follies, where neither harmony of form, nor proportion, nor even common sense in structure were to be found. But, thanks to the long training English artists have had in the Gothic Revival, the Queen Anne style has at last given rise to original architectural works of real value, where the principles of Gothic architecture are followed, but where its Middle Age features have been replaced by others more in keeping with our wants and means of construction. These real works of art are in our opinion the origin of the "Modern Style" which has started the artists of the Continent in the wake of England. For the present, Continental work in the "Modern Style" is full of incongruities. The suppleness of English architecture hardly fits the immense barracks seven storeys high let in flats either in Paris or Vienna. When bow-windows, adopted from the English, go through seven storeys, they produce a very different architectural effect from our own. Most of the Continental architects still continue under the name of "Modern Style" the absurdities of Classic architecture, and even invent features which are contrary to convenience or good construction. But time will clip the wings of those who have gone mad with their newly acquired freedom, and it is to be hoped that the "Modern Style" born in England will bring us soon into a real wholesome state of art all over the world.

THE AGE OF STONE CIRCLES.*

(Concluded from last week.)

IV. *Excavations in the Position of the Ancient Southern Entrance.*

CUTTING III. having given us no evidence of the position or existence of a southern entrance into Avebury, we found it necessary to pay attention to the area to the east, on the other side of the high road, both near the two large standing-stones of the outer circle on the property of Lord Avebury and in the position of the plantation of beech trees owned by Captain Jenner, the two properties being divided here by a barbed-wire fence. The trees were noticed to be planted on a slight ridge so near the road that it was thought possible that it might be the result of a collection of rubbish from the highway and elsewhere, and especially as the position is covered on the south by the end of the outer vallum which appears to obstruct any direct approach to the most northern remaining stone of the Kennet Avenue. But it was, on closer examination, observed that the slight ridge also extended towards the north into the meadow in the direction of the space (24 feet) which exists between the two remaining standing-stones of the outer circle.

(*a*) *Cutting IV.*—Forthwith we made a cutting (No. IV.), length 47 feet, width 5 feet, approximately at right angles to the ridge and 23 feet from the most westerly of the standing-stones. Here we reached the solid chalk in the middle of the cutting at a depth of 2 feet from the turf, and there appeared to be no sign of a continuation of the fosse in this position. The same depth was maintained to the most easterly part of the cutting, but there were occasional dips in the chalk which appeared to have no special significance. At 28 feet from the eastern end there was a step in the solid chalk down to a depth of 3 feet from the surface; at 33.5 feet another step to a depth of 4 feet from the surface; then a level floor for about 5.5 feet, followed by a gradual slope downwards to a depth of 4.5 feet. Having almost reached the hedge, we could go no further. But we had struck the causeway and what appeared to be steps down to the brink of the ancient fosse at its termination on the west of the entrance.

A large number of shards, glazed and unglazed, were found between the turf and a depth of 18 inches in the middle parts of the cutting, all of which appeared to be mediæval and later ware. In the deeper part on the west a few pieces of brown pottery, which we regarded as mediæval, were found in or on a distinctly blackish-brown seam of mould, the result probably of disturbance at such a time as the modern bank and hedge were made.

(*b*) *Cutting V.*—The next cutting made was close to the fence on Captain Jenner's property. The western half was cut 5 feet wide, the eastern 3 feet. It was begun close to the road fencing and continued in an easterly direction for a distance of 54 feet. At 29 feet from the eastern end the solid chalk was reached at a depth of 1.4 foot from the surface—the level of the ancient causeway. From this point eastwards the surface of the ground sloped towards the eastern fosse; likewise the solid chalk sloped downwards gradually, not evenly, but in rough shallow steps. At 50 feet from the western end of the cutting the solid chalk shot down suddenly at an angle of 46°, at which point the brink of the eastern fosse was undoubtedly reached. The western end of the cutting is more difficult to describe, because we met with a modern earthenware drain-pipe, for draining the surface-water from the modern road into the eastern fosse, the placing of which had destroyed the contour of the solid chalk as left by the constructors of the causeway.

(*c*) *Cutting VI.*—Another cutting (length 56 feet, width 2.5 feet) was made close to and parallel to the barbed-wire fence, and on Lord Avebury's side. This revealed the solid chalk running level for a length of 26 feet, the nearest part of the surface of the turf being at a depth of 1.6 foot. At 19.5 feet from the west end of the cutting the solid chalk dropped in two steps towards the western fosse, in the same manner as described in Cutting IV. At the E. end of the cutting the chalk sloped off very gradually.

(*d*) *Cutting VII.*—This narrow cutting was dug amongst the beech trees on the Jenner property. The length examined was 50 feet, but a part in the middle had to be left untouched on account of the large roots of the trees. This cutting gave clear evidence that the causeway was 24 feet wide at the top in this part, and at a minimum depth of 1.8 foot from the surface. From the margins of this ancient road of solid chalk rough steps downwards were traced in both directions. In the eastern half the brink of the fosse was reached at a distance of 14 feet from the eastern margin of the top of the causeway, from which point the solid chalk had been cut abruptly downwards at an angle of 51° into the depths of the fosse below.

No relics of datable importance were found in any of these cuttings.

V. *Excavations round a Prostrate Stone.*

The fallen sarsen stone chosen for examination this year is one of a group of five (two standing, three fallen) forming the south and south-west portion of the southern of the two inner circles. It is the most southern of the remaining prostrate stones of this circle, at a distance of 144 feet to the north of the most western of the two standing-stones near the entrance. Before excavation the stone was seen to have fallen in a southerly direction, the north end being considerably covered by turf. The digging was carried down to the solid chalk on all sides except the south and south-west.

This digging proved (1) that the stone measured 16½ feet long by 12 feet wide; (2) that it had fallen in or since mediæval times; (3) that a socket-hole had been cut into the solid chalk to a depth of 1.5 foot, roughly shaped to receive the base of the stone; (4) that for additional support the

* Abstract from report of the committee, consisting of Dr. C. H Read (chairman), Mr. H. Balfour (secretary), Lord Avebury, Professor W. Ridgeway, Dr. J. G. Garson, Dr. A. J. Evans, Dr. R. Munro, Professor Boyd Dawkins, and Mr. A. L. Lewis, appointed to conduct explorations with the object of ascertaining the age of stone circles. Drawn up by the Secretary.

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stone had been packed round with a considerable number of blocks of sarsen measuring from 4 inches to 16 inches across; (5) that the base of the stone had been set at a depth of 4.3 feet from the present surface of the field; and (6) that the base of the stone in its fall had kicked out in a northerly direction only to the extent of 2 feet.

A number of shards were found in this excavation, but nothing was apparently of earlier date than Norman times. Between the surface and a depth of 2.5 feet and above the level of the socket-hole cut into the solid chalk this mediæval pottery appeared to be plentiful enough to indicate the former existence of some kind of a dwelling close against the stone, and it is possible that shelter for a number of years together may have been taken in close proximity to these huge standing-stones. Some of the pottery was found under the north end of this prostrate stone; it was, however, observed that the shards were close against the stone, and none below the level of the natural bed of the solid chalk.

A scale plan and two sectional diagrams were made of this excavation.

VI. *Animal Remains.*

Last year were found the remains of ox (of two sizes), horse (of two sizes), sheep, red deer, ? roebuck, pig, dog, fox, ? wolf, and fowl. Some of these were kindly identified by Mr. E. T. Newton, F.R.S.

Besides the red deer antler picks and the shovels of *scapulæ* previously recorded, the following animal remains were found this year:—

Cutting II.

Ox.—Humerus, depth, 6.3 feet in Roman stratum; tibia with ends missing, depth 9.5 feet in bronze age stratum; part of radius of a young animal, depth 18.5 feet on bottom of fosse; metacarpus of large ox (length 240 millimetres; estimated stature 4 feet 9 inches), depth 7.5 feet in Roman stratum; two digits, depth 7 feet.

Red-deer.—Two pieces of tine of antler, depth 8 feet in mixed silting (No. 121 in section); smooth piece of tine of antler, depth 10.2 feet at bottom of mixed silting (No. 127 in section); part of a metacarpus, depth 9 feet.

Mole.—Scapula and sternum; depth not recorded.

Toad.—Ilium; depth not recorded.

Cutting III.

Three teeth of horse; depth, 9.5 feet in Roman stratum.
Astragalus of ox; depth, 9.5 feet in Roman stratum.
Digit of red-deer; depth, 11.5 feet in mixed silting.
Scapula of sheep; depth, 18 feet in chalk rubble.
Lower jaw of dog, smaller than a retriever; depth, 4.5 feet.

VII. *Concluding Remarks.*

The season's work, considering its short duration of three weeks for an undertaking of such magnitude, has in many respects been more interesting and eventful than the opening excavations of 1908. The main results of 1909 embody (1) proof of the existence and position of an ancient entrance into "the Temple" from the south, *i.e.* from the direction of the Kennet Avenue, and (2) a considerable strengthening of the evidence obtained last year towards solving the difficult problem of the date of construction of Avebury, or, at any rate, of the great fosse surrounding the circles. The finding of a worked flint knife with every appearance of great age, and of typical Neolithic form on the bottom of the fosse, is, we think, almost sufficient in itself to assign Avebury to the Neolithic period, rather than to the early bronze age—to which period Stonehenge is referred on fairly strong evidence.

It is also necessary in considering date to draw attention to the position of the pottery of bronze age type, most of which occurred about half-way down in the accumulated silting, showing that it became deposited when the fosse had become filled to a considerable extent; and some of the early British pottery was found in the mixed silting immediately below the Roman stratum.

In addition to the knife the bottom of this vast fosse has revealed several picks of antler and shovels of bone to the exclusion of other tools, and although there is no reason why such implements should not be used in later times, those found at Avebury are of precisely the same type as those of undoubted Neolithic age discovered in some quantities at Cissbury, the Grime's Graves, and in the Neolithic pit at Maumbury Rings. We have now little or no hesitation in regarding the fosse of Avebury as being of Neolithic construction; but it would be highly desirable, if not advisable, to make one or two cuttings more into a fosse affording the variety of interest which the Avebury one does. It must have been a most imposing sight—never to be blotted out from one's memory—to see that stupendous fosse open to the bottom all the way round.

Now that we know the position of the southern entrance it would be highly interesting to excavate the rounded end on its eastern side. The beech-trees and the modern road would not be hindrances in this position, and it would be necessary only to remove some scrub and small bushes. The silting not being so high as in the parts already examined, and probably at no time under cultivation, the labour entailed in re-excavating this part would be proportionately less than in this year's cuttings.

It would also be desirable to prove whether an entrance-causeway exists at the north of Avebury, and there are other details to clear up in regard to the southern entrance. In the latter work this year we were pressed for time, and were hindered in determining the exact width and form of the causeway throughout its whole length, and our work was also impeded by the plantation of beech-trees.

As far as the causeway could be examined, the top, found at an average depth of 1.7 foot from the surface, was about 24 feet wide. On either side the level of the solid chalk gradually receded as if sloping off to meet the upper margin of the walls of the fosse in the form of rough steps not always well defined. The brink of the eastern fosse was followed in two places only. On the west such obstacles as the wooden fence, the bank and hedge, and the road itself, prevented any exact determination of the manner in which the western fosse finished and the causeway began. However, the existence of the entrance-causeway is a proved fact, the portals to the central area being represented by the two great standing-stones of the outer circle still in their original position.

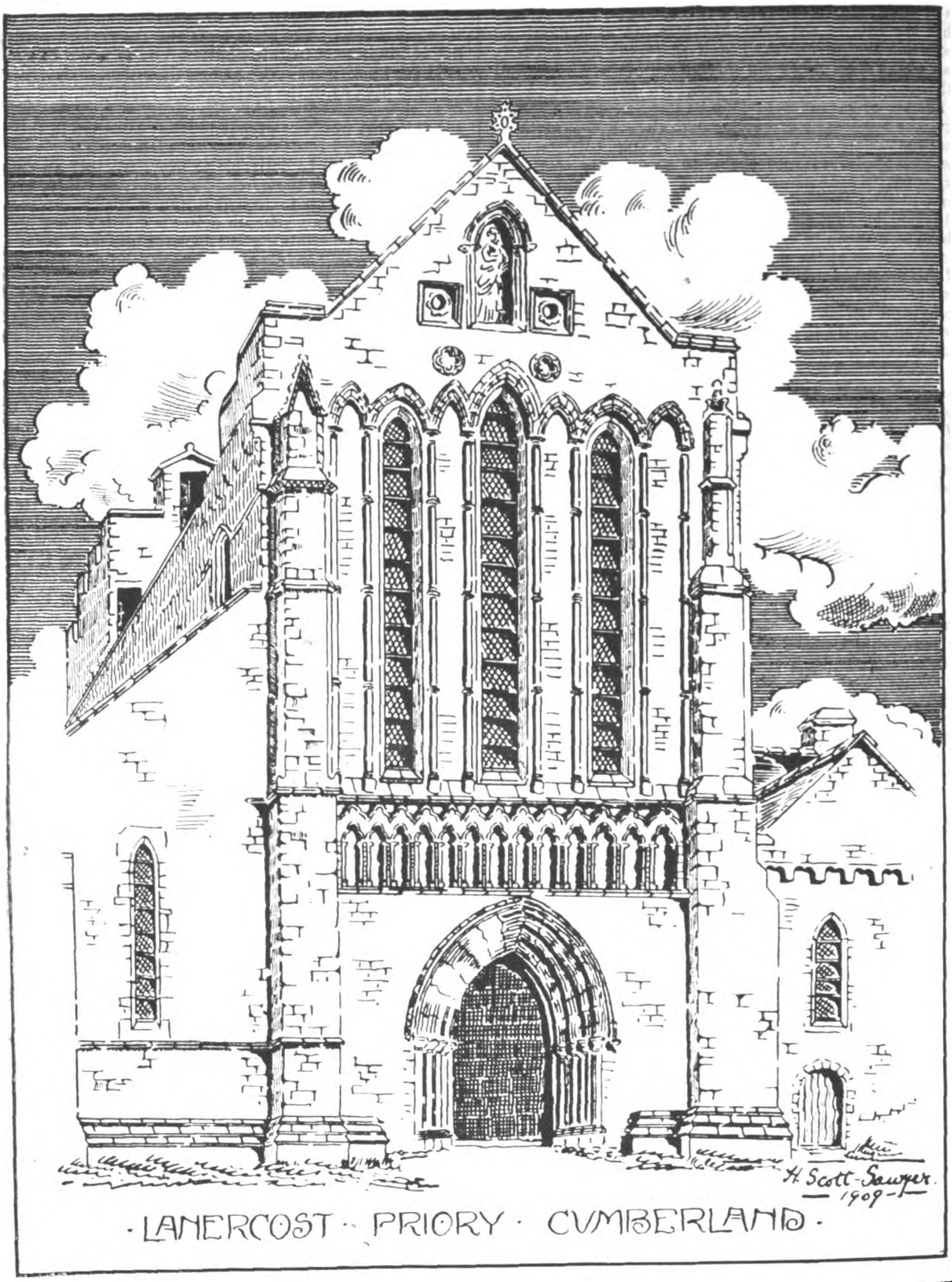
The vallum now remaining nearest to the causeway would appear to have obstructed the entrance-way from the Kennet Avenue, but this is not really so, for allowance must be made for the silting down of the material composing the vallum at its end, forming a talus, and for the fact that other beech-trees have been planted in this position, caused obstruction, and gathered round them a certain amount of decayed vegetable matter.

PREHISTORIC ANTIQUITIES IN MALTA.*

EXCAVATIONS have been conducted by the Government of Malta on the Corradino Hill, in which the co-operation of the British School at Rome has been cordially welcomed, and its investigations assisted in every way; the supervision has been entrusted to the Director of the School and to Mr. T. E. Peet, Student of the School, assisted by the constant co-operation of Dr. T. Zammit, Curator of the Museum. The great megalithic buildings of Gigantia, Mnaidra, and Hagar-Kim, which Dr. Arthur Evans considers to have been buildings of a sepulchral character in which a cult of departed heroes gradually grew up, and other smaller prehistoric monuments of the islands, have been carefully described by Dr. Albert Mayr, though others have since become known, but excavation was needed in order that many essential facts might be ascertained. The investigation of the rock-cut hypogeum of Halsaflieni, the architectural features of which imitate in the most surprising way those of the sanctuaries above ground, has for the first time produced an adequate series, available for study, of the prehistoric pottery of Malta; for from the excavations of Hagar-Kim but little has been, unfortunately, preserved. Dr. Zammit and Professor Tagliaferro will shortly publish adequate descriptions of the hypogeum and its contents. Of the three groups of megalithic buildings on the Corradino Hill, two had been already in great part excavated in the nineties, and the complete clearing of the upper one, which apparently was of a domestic character, was the first work undertaken in May. Its plan is extremely irregular, and much of it can hardly have been roofed unless in thatch or woodwork. A considerable quantity of pottery was found, very similar in character to that of Halsaflieni, and belonging, like it, to the late neolithic period. It has some affinities with pottery recently found at Terranova, the ancient Gela, in Sicily, but in many respects is unique. Many flints were found, but no traces of metal. A stone pillar was found in one portion of the building, some 2 feet 8 inches long and about 10 inches in diameter, which may have been an object of worship. The excavation of a second and smaller group, nearer the harbour, had been already completed by Dr. Zammit and Professor Tagliaferro; but a third, further to the south, on the summit of the ridge, had never been examined, and it, too, was thoroughly investigated. An even larger quantity of pottery of the same character was found, with flints and

* A report made to the British Association at Winnipeg by T. Ashby, M.A., D.Litt.

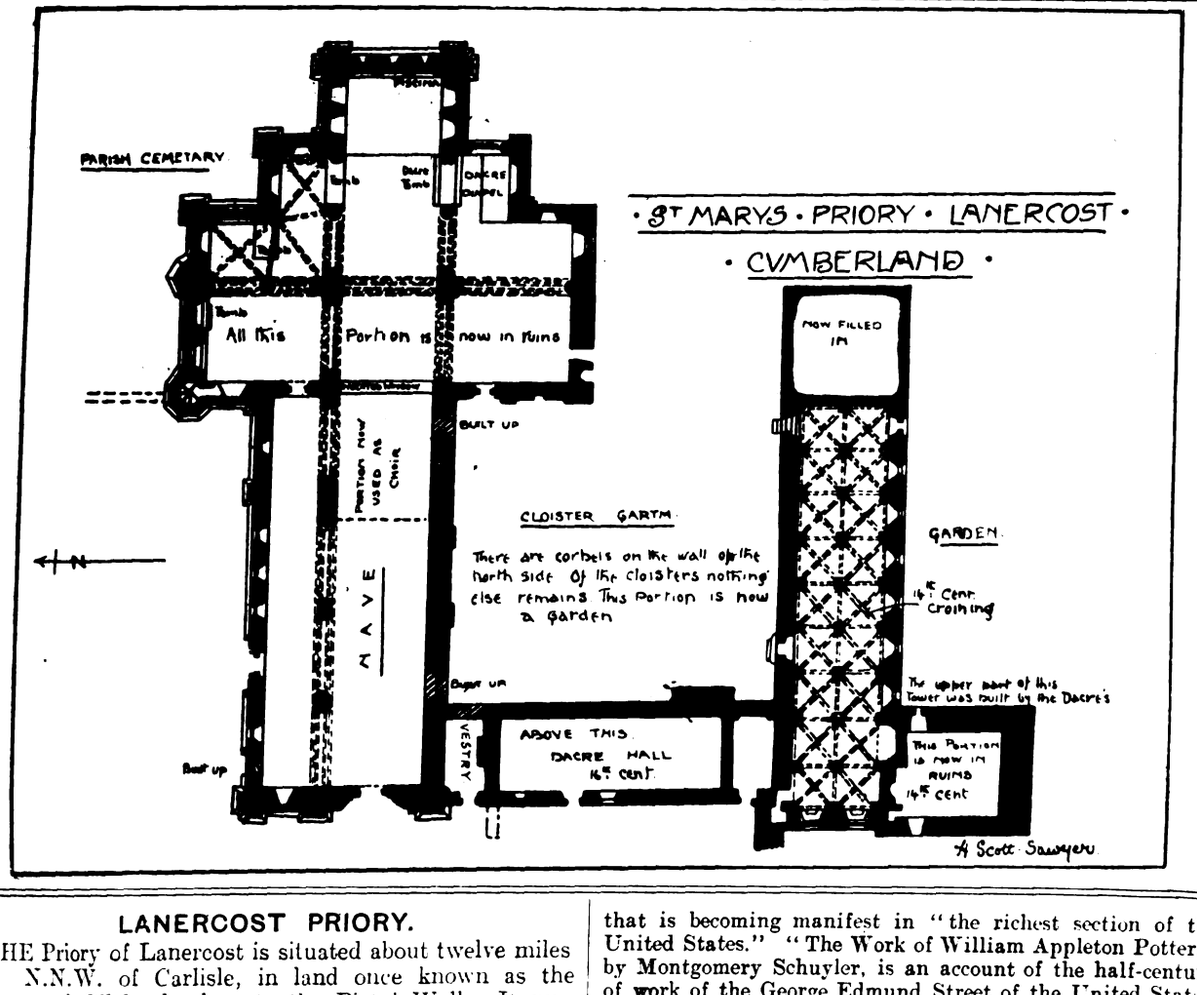
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fragments of stone basins, &c. It approximates more in style to the larger megalithic buildings of the island, and has a façade with a more pronounced curve than at Hagar-Kim, constructed of very large blocks, but much ruined. The interior consists of several distinct groups of rooms (often apsidal) not intercommunicating. The construction is of rough masonry, with large slabs at the bottom, and smaller blocks higher up; the walls begin to converge, even at the height (5 to 6 feet) to which they are preserved, as though to form a roof. Into one of the rooms a very curious trough has at a later period been inserted: it is cut in a block of the local hard stone, 8 feet 9 inches long, 3 feet 8 inches wide, and is divided by six transverse divisions into seven small compartments, which show much trace of wear. The object of it is not as yet apparent. Another more carefully constructed room, perhaps contemporary with the trough, has its walls partly of large slabs, partly of narrow pillar-like stones. The floors of these rooms are sometimes of cement, sometimes of slabs. Many bones of animals were found, but only one human skeleton, and that in disorder and at a comparatively high level. The use of standing slabs at the base of walls, with coursed masonry above, visible in these buildings, finds its parallel in the Giants' tombs at Sardinia, the prehistoric huts of Lampedusa, and in many other places.

A Statue representing the robed figure of the late Archbishop Maclagan, of York, is to be placed on the east side of Selby Abbey's new tower balustrade. Other statues that are to be placed there are of King Edward, William the Conqueror, and Abbot Hugh de Lacy, who holds in his left hand a miniature model of the first abbey at Selby, which he built.

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LANERCOST PRIORY.

THE Priory of Lanercost is situated about twelve miles N.N.W. of Carlisle, in land once known as the Barony of Gilsland, close to the Picts' Wall. It was consecrated in 1169 A.D., and dedicated to St. MARY. The west front is of a very simple design, but the proportion is good. The west door is a very good example of the Early English, and the mouldings, springing from circular caps, are formed upon a square order. Above the doorway are thirteen niches, and at one time very probably they had sculptured figures of Our LORD and His twelve apostles. In the gable within a recessed niche is a sculptured effigy of MARY MAGDALEN, carrying an alabaster vessel, and kneeling before her in a supplicating attitude is the figure of a monk. As is common with Augustinian buildings, the nave has only one aisle, which is on the north side of the church, and in it the vaulting is a beautiful example of the early development of the English vaulting system. The choir, now in ruins, contains some very interesting tombs, &c., and the plan of the priory is cruciform.

Our sketch and plan are by Mr. H. S. SAWYER, 12 Howard Place, Carlisle.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* specially devotes itself to description and illustration of the architecture of Atlanta, Georgia, which is practically a new city built since the civil war of forty years ago. The most important building illustrated is the Forsyth Theatre and Office building, a combination of theatre and business premises, of which Mr. A. Ten Eyck Brown is the architect.

La Construction Moderne illustrates a private house or "petit hotel" in the Rue de la Faisanderie, Paris, M. Blanche being the architect. This is a typical French design full of refinement and free from all eccentricities or affections of "l'art moderne." The article on perspective drawing with a home-made trammel is continued.

The *Architectural Record* has this month several interesting articles. "Drawing, Designing, and Thinking," by William R. Ware, is thoughtful and thought-inducing. "The Architecture of the Pacific North-West," by Robert C. Sweatt, illustrates the improvement in architectural design that is becoming manifest in "the richest section of the United States." "The Work of William Appleton Potter," by Montgomery Schuyler, is an account of the half-century of work of the George Edmund Street of the United States, with whose work both in its Gothicism and its ecclesiastical character Mr. Potter's designs have much in sympathy. Like Street, Mr. Potter passed through various phases of influence, Venetian, French, English Gothic and the Richardsonian manner all swayed his style. "Some Impressions of Modern German Architecture," by Alfred Hoyt Granger, is an appreciation of the remarkable movement that has taken place in the architecture of Central Europe during the last twenty years, the outcome of a well-proved development of the "new art" principle that in the hands of its best exponents has eliminated from architectural design everything unnecessary, depending only on simplicity and proportion. "Some Sixteenth and Seventeenth Century Parisian Mansions," by Frederic Lees, brings before us some of the charming domestic buildings of old Paris.

Berliner Architekturwelt gives us a description and illustrations of some of the exhibits of the Home Exhibition held at the Berlin Zoological Gardens this year, excellent examples, principally of internal treatment, of modern German simplicity and good proportion in architectural design. "Marinehaus," by Otto Leisheim, a block of buildings at the corner of Brandenburgh Ufer and am Köllnischen Park, Berlin, is a combination of concert hall and flats. Several other groups of flat-buildings are illustrated, so that we have quite a review of modern German architectural work in this direction. It is remarkable how much play of light and shade is obtained in these purely commercial enterprises by judicious use of bays, oriels, recessed loggias, balconies and studied roof treatment, although the buildings are brought strictly up to the street line on the ground floor.

Der Profanbau devotes itself entirely to the new baths erected at Breslau by private enterprise at a cost of over 66,000*l.*, from the design of Professor W. Werdelmann, a quite remarkable example of bath design, containing many features that one would hardly deem possible in a building that must be made to pay its way.

Deutsche Bauzeitung illustrates a charming open-air bandstand or "music-temple" recently erected as an adjunct to the town theatre of Dortmund, from the designs of Professor Martin Dülfer. Some picturesque buildings of the Royal Bavarian Ministry of Commerce, chiefly station-masters' houses and post-offices, are also illustrated.

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Der Architekt illustrates the competition design of Heinrich Ried for new buildings of the War Office "am Hof" at Vienna, with a nicely reproduced water-colour of the present buildings. A design for a detached private house in Vienna is delightful in its breadth, but one wonders how the rooms are lighted.

COMPETITIONS.

THE Newburn District Council have received sixteen sets of plans for a new Council chamber, offices and caretaker's house. The competition was limited to architects practising in Newcastle-on-Tyne and Northumberland. Mr. R. J. Leeson is acting as assessor.

The Lytham Town Council have been considering the question of reconstructing or adapting the baths and assembly rooms for a public hall. They have decided to invite sketch plans and estimates for (1) the reconstruction only of the baths and assembly rooms; (2) adapting the existing buildings for improved baths and public hall from the following invited architects:—Messrs. S. Thomas, Ansdell; A. S. Gledhill, Lytham; Haywood & Harrison, Lytham; and Muirhead & Co., Manchester. Plans have to be in by September 15.

Correspondence.

[*The Editor will not be responsible for the opinions expressed by Correspondents.*]

London University Appointments Board.

SIR,—It may be of interest to many of your readers to know that an Appointments Board has been constituted by the University of London. The terms of reference to the Board are "to assist graduates and students of the University in obtaining appointments, and to co-ordinate and supplement the work done by the schools and institutions of the University with this object." I am directed by the Board to express their hope that, through the medium of the Press, the objects of the Board may be brought to the notice of graduates as well as of those who are able and willing to assist in furthering the work of the Board, the aim of which is to encourage the selection of university men for all posts in the work of which the possession of a university training on scientific methods is an advantage. They wish to assist graduates to find employment, and to assist employers to find in the university ranks suitable men for vacancies.

It would assist the Board if, whenever your readers know of any vacant appointments suitable for university men, they would communicate with the Secretary of the Board, so that he may put forward selected candidates. In this way the work of the Board as an employment exchange would be greatly helped.—Yours faithfully,

HENRY A. MIERS, Principal.

University of London, South Kensington, S.W.

The People's Budget.

SIR,—It was with much interest I read the Auctioneers' Memorial, published in your issue of the 20th ult. It is an excellent and carefully drafted document which must have met with general approval, as it contained practically all that was necessary from an auctioneer's point of view, but as it seemed rather to consider the interest of the land owner it was hardly likely to meet the approval of Mr. Lloyd George. Had the auctioneers pointed out the loss and suffering sustained by the working-classes, more sympathetic consideration would have been obtained.

Of late years a number of auctioneers have speculated in building land, acting as their own architects and their own builders, giving employment to a large number of workmen. Surely some of these gentlemen could have pointed out to the Chancellor what damage the Budget was doing to all workmen connected with the building trade.

The working-classes are the predominating Parliamentary voters, who are awaking to the fact they have been played with long enough. To obtain their votes, at one time they are promised three acres and a cow, and at another ample work and a big loaf, but at no time has there been such crowds seeking for work and begging for bread.

The workmen are not the only sufferers, as many able architects, surveyors and builders have to reduce their staff for lack of work through the disinclination of men of capital and enterprise to consider any building project until the present Budget is dead and buried, and public confidence restored.—I am Sir, yours faithfully,

FREDK. NESBITT KEMP.

14 Featherstone Buildings, W.C.: Sept. 6, 1909.

GENERAL.

Maiden Castle, near Dorchester, the greatest of the prehistoric camps of England, has now been transferred to the guardianship of the Office of Works.

The Canterbury City Council have rejected a resolution that the Dean and Chapter be asked to alter the time of the cathedral clock to Greenwich time. The time is over four minutes faster than that of Greenwich.

Mr. Lloyd George, M.P., has stated that he cannot see his way to granting the request of the National Trust for Places of Historic Interest or Natural Beauty that land conveyed by gift or purchase, and dedicated to the use of the public and held by the National Trust or any such public body, should be exempt from stamp duty under Clause 53, sub-section 1, of the Finance Bill. He added that in exceptional cases of established hardship power already exists for granting relief.

The Blackburn Town Council last week adopted a formal resolution giving power to the Corporation to borrow 80,000*l.* for a period of sixty years to build and furnish public buildings on Blakey Moor.

The Public Health Committee of Dundee Town Council have agreed to instal a system of electric lighting into King's Cross Hospital at a cost of between 250*l.* and 260*l.*

The Programme of weekly lectures for the session 1909-10 in connection with the Newcastle Literary and Philosophical Society has been issued. It contains the following in the miscellaneous course:—September 27.—Professor W. M. Flinders Petrie, D.C.L., LL.D., F.R.S., "Discoveries at Memphis and Thebes." October 11.—F. W. Dendy, "The Making of Newcastle." November 1.—Herbert Thompson, M.A., LL.M., "Painting in England from Holbein to Hogarth." January 31.—George Hubbard, F.S.A., F.R.I.B.A., "Dew Ponds." February 14.—S. C. Kaines-Smith, M.A., "The Triumph of Athena: Athens and the Panathenaea in the time of Pericles." February 28.—Vaughan Cornish, D.Sc., "The Panama Canal." Mr. A. Hamilton Thompson will give a series on "Renaissance and Modern Architecture."

The Report of the departmental committee of the Home Office, appointed on March 22 "to consider and report what place would be the most suitable, having regard to convenience and economy, for transacting the Quarter Sessions business of the County of London; and what, if any, improvement could be made in the arrangements for the trial of criminal cases and the hearing of appeals," was issued on Saturday as a Parliamentary paper. The committee are strongly in favour of the purchase of a central site—i.e., in the area bounded by Holborn, Farringdon Street, the Strand and Shaftesbury Avenue—and a new Sessions House erected thereon. It is said the existing Sessions House at Newington is insufficient to accommodate all the business of the Sessions, and cannot be rendered suitable by means of enlargement or alteration unless at a grave sacrifice of convenience.

The Council of the Royal Society of Arts hold a sum of 400*l.*, the balance of the subscriptions to the Owen Jones Memorial Fund, presented to them in 1876, on condition that the interest be spent in prizes to "Students of Schools of Art who, in annual competition, produce the best designs for household furniture, carpets, wall-papers and hangings, damasks, chintzes, &c., regulated by the principles laid down by Owen Jones." Competitions, under the terms of this Trust, have been held annually since 1878. The next award will be made in 1910, when six prizes are offered, each to consist of a copy of "The Leading Principles in Composition of Ornament of every Period," from the "Grammar of Ornament," by Owen Jones, and the Society's bronze medal. The designs must be submitted by April 1, 1910.

The Cowley Fathers have granted the Vicar of Worksop the use of the Priory Gatehouse for church and parochial purposes. Its restoration at a cost of 500*l.* is now under consideration. The Gatehouse is of great archæological interest.

The Old Tramway Station in Regent Road, Bootle, is to be adapted into a roller skating rink. The alterations are expected to cost between 500*l.* and 700*l.*

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The Architect.

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FORTHCOMING EVENTS.

Thursday, September 23.

Institute of Sanitary Engineers: Opening Sessional Meeting a Caxton Hall, Westminster, S.W.

Saturday, September 25.

Institution of County and Municipal Engineers: Eastern Distric Meeting at Lincoln.

Monday, September 27.

Architectural Association: School of Architecture, Winter Term begins.

Iron and Steel Institute: Autumn Meeting in London September 27 to October 1.

Monday, October 4.

Royal Academy: Course of six Lectures on "Chemistry" by Professor A. H. Church, D.Sc., M.A., F.R.S., opens. Subject: "Paper, Canvas, Panel, and other grounds."

Friday, October 8.

Architectural Association: Annual General Meeting. President's Address and Distribution of Prizes.

COMPETITION DRAWINGS FOR EXTENSION OF GRIMSBY TOWN HALL.

THIS is one of the most unsatisfactory competitions that has been promoted for some time, even more so than Stoke-upon-Trent, for in this case not only is the sum allowed insufficient for what is demanded, but the competitors were hampered by a suggested plan, sent out with the instructions, which is virtually the idea of Sir GEORGE DOUGHTY, M.P. for the borough and prime mover in the scheme for the extension of Grimsby's present town hall. It has been made evident by the result of the competition that the suggested plan, with all its faults—and they are many—has ruled the situation, and that no design however good stood any chance of success if it departed materially from the suggested plan. The estimates of cost of the competitors have clearly been made very largely on the good old competition method of cubing at 1*d.* to see what price can be allowed. Perhaps too much credit has been given to the fact that Grimsby is a port, but it takes a lot of water carriage to bring down the price of a town hall to 4*d.* a foot cube.

The result of the unsatisfactory data of the competition is that very few architects of ability have entered, and there is therefore an exceptional display of ambitious incompetence wrestling with impossible conditions and producing futile conceptions. Those architects who have taken part in the competition have been wrecked between the Scylla of an impossible suggested plan and the Charybdis of too great expense.

The first premiated design by Messrs. EADE, JOHNS & BROWNE follows very closely on the sketch plan supplied to competitors with the instructions. The present assembly room is "extended," that is to say, it has had its front wall and two end walls removed, and the remaining wall considerably altered, thickened, and raised. Then in place of the old assembly room is built a large assembly hall 93 feet by 60 feet, with a segmental ceiling, the height to the springing being 32 feet and to the crown 42 feet. A good platform is provided at one end of the hall and a large gallery runs round the better part of three sides. The entrance is at the west end, where a crush hall, principal staircase, councillors' retiring room and committee room fill out the building in this direction. At the east end of the assembly hall is a green room with retiring rooms for ladies and gentlemen opening off it, and above these are the raised seats for the orchestra. The assembly hall with its adjuncts east and west forms a block 184 feet long by 65 feet deep, and is admirably planned for its purpose. The present stair to the assembly room is retained as a secondary stair to the new large hall. On the ground floor of the front block is located the Town Clerk's department with three committee rooms and public and private parlour for the Mayor. There is a central corridor 10 feet wide, which, like the corridors generally in the suggested plan of Sir GEORGE DOUGHTY, appears to us very inadequately lighted.

At the rear of the front block on the first floor the present banqueting room and its adjuncts are retained, as is also the council chamber. In front of the council chamber is a new corridor and committee room, the walls of which are supported in mid-air over the county court below. The new corridor between the council chamber and committee room leads to the grand staircase lobby of the smaller assembly hall, which is 61 feet by 61 feet. On the ground floor the Borough Treasurer's department and that of the Borough Engineer are placed under the smaller assembly hall, the Registrar's court below the council chamber, the county court, as already mentioned, below the large committee room, corridor, and lavatory, and the enclosing walls of these, whilst the police court is neatly fitted in between the old police station and the Registrar's court. Under the banqueting room is placed the Medical Officer of Health's department, and by a strange irony that official's private office is lighted by two windows looking into an area which is 7 feet wide in front of one and 9 feet wide in front of the other.

As in the suggested plan the public entrance to the smaller assembly hall is common also to the three courts, whilst the Borough Treasurer and the Borough Engineer can only interview the Town Clerk by going out into the street, traversing the legal portion of the building, or going upstairs, along a corridor and down again.

The plan, granting the necessity of following closely the suggested plan, is excellent, but the suggested plan has many grievous faults, and these, though minimised, are reflected in the accepted design. It is fortunate that Grimsby is not very far from Middlesbrough, as the amount of steelwork that will be required to carry walls over voids will be quite exceptional. The cost of shoring will also be very great, and we doubt very much if the work can be carried out for the sum estimated. The two assembly halls with the offices under are cubed at 5*d.*, and the rest of the new building at 6*d.* From the amount thus obtained, 2,600*l.* is deducted for value of old walls and foundations and old material re-used.

The elevations include a lofty tower, and are shown to be carried out in stone with a considerable amount of costly work of good modern municipal Renaissance character if not very original.

The second premiated design, by Messrs. WITHERS & MEREDITH, though following generally the arrangement of the suggested plan, does so very much less closely than the first premiated, and we may also say very much less ably in many respects. The Law Courts department is rather better than in the winner's plan, with the exception of one quaint eccentricity—the entrances to the galleries of the three courts are through the cloak-rooms of the

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ladies and gentlemen using the small assembly hall, and the gallery of the county court forms a means of communication with those of the police court and Registrar's court, so that when the unwashed and unemployed of Grimsby are tired of listening to a civil action they can find relief by attending a criminal case. The offices in general are well lighted, and there is not so much dark corridor as in the first premiated design, but to get these advantages the large assembly hall is shorn of much of the attractiveness of the selected design. The elevation is somewhat similar to that of the first premiated, with a lofty tower, which, however, does not grow naturally out of the substructure, but seems to shoot up through the roof rocket-like.

The design placed third by the assessor is by Messrs. RIGBY, OLIVER & PHIPPS. It follows the suggested plan even more closely than either of those placed before it, and so retains more of the original faults, such as a Town Clerk's general office 32 feet 6 inches deep lighted from an area or well hole 9 feet 6 inches wide.

The elevation again has the big tower, but there is a general unrest due to defective composition and multiplicity of incoherent detail that quite precludes any satisfactory result.

Mr. STEWART M. MOULD has wisely preserved intact what of the old buildings he has used, the banqueting room, the assembly room, and the council chamber with the rooms under, and has produced a plan that to our mind is far superior to any of those placed by the assessor. The exterior is dignified and broad in treatment, but cubing at 4*d*. and 4½*d*. would hardly cover the cost.

Messrs. RUSSELL & COOPER have submitted two designs. In the one they retain the old banqueting room, council chamber and assembly hall, and propose a new large assembly hall at a skew angle to the lines of the main and existing buildings. A good plan is the result, and there is no doubt that for the accommodation asked some such scheme as this is the best solution of the problem, but the limit of cost is prohibitive. Messrs. RUSSELL & COOPER cube their large hall at 5*d*. and the remainder of the buildings at 6*d*., with 2*d*. for the old buildings that are re-used with alterations. The second plan sent in by Messrs. RUSSELL & COOPER is unworthy of their reputation, though better than many others in the competition. In this design they show a tower, but in the first mentioned there is none, and a dignified and almost too severe composition is proposed.

Professor BERESFORD PITE, like Messrs. RUSSELL & COOPER, retains the banqueting room, council chamber and assembly room, and proposes a new large assembly hall in a similar position and on similar lines. The result is a good plan, though not without faults of detail. The exterior is a very quaint conglomeration of picturesque bits from seventeenth-century Germany.

Mr. G. WASHINGTON BROWNE has kept the old banqueting room and assembly room, but swept away the present council chamber and provided a new one, as well as a new large assembly hall. In this case, by utilising the site of the old council chamber, the new large hall is kept rectangular with the remainder of the building. The plan is on the whole good, though there are such faults as an enquiry office for the town clerk with no light. Mr. BROWNE cubes at various figures, from 6*d*. to 9*d*., so that if his calculations are correct he has produced one of the most economical plans submitted in the competition.

Mr. E. MONTAGUE THOMAS has followed too closely the suggested plan to rank with either the selected design or the best of those that depart from the ideas of Sir GEORGE DOUGHTY, and Messrs. LEEMING & LEEMING are in the same boat. In their external treatment Messrs. LEEMING seem to have tried to make their building look as little like a town hall as possible by using a two-storeyed arrangement of comparatively small windows for their large assembly hall. The result is a design that would be admirable for a block of municipal offices, but not expressive of the functions of the town hall that Grimsby—or Sir GEORGE DOUGHTY—wants.

BELFAST AND ITS ABATTOIR.

THE plan prepared apparently by the City Surveyor and now put forward by the City Council of Belfast for the proposed new abattoir is subjected to severe criticism by Mr. JAS. J. PHILLIPS, an architect practising in that city, and his strictures appear to us to be quite well founded. In the planning of an abattoir the most important of all considerations is the preservation of the purity and quality of the meat. It is only the attainment of this desideratum that justifies the existence of an abattoir at all. If it is not attained it would be better, as was done almost universally half a century ago, to let each vendor of meat kill his own animals one at a time as he wanted them, and to be a butcher in reality rather than as he is at present a purveyor of meat. With somewhat more careful attention to cleanliness and sanitary conditions than too often prevailed in the old days, the slaughtering of beasts singly has much to recommend it as superior to the modern abattoir system of wholesale hecatombs, as regards both the freedom from taint of the meat and the avoidance of unnecessary cruelty.

The avoidance of cruelty is an essential in abattoirs only slightly less important than the maintenance of the purity of the dead meat, for it is undoubtedly the fact that pain, whether physical or mental, inflicted upon an animal about to be slaughtered is detrimental to the quality of the meat. So that apart from all humane considerations the infliction of unnecessary pain or even discomfort upon the beasts is bad business. When an animal is about to be killed for food it must necessarily be brought into a strange environment and every care should therefore be taken so to arrange an abattoir as to prevent any undue cause of alarm. Strange noises, strange sights, and especially strange smells must be as far as possible avoided. Above all the sounds of killing, the sight of carcases, the smell of blood must be kept from the cognisance of the animal whose time has not yet come.

Other desiderata of a well-planned abattoir are easy access for butchers or purveyors of meat, healthful conditions for slaughtermen, drovers and dressers, easy inspection and supervision by veterinary surgeons and other officials controlling the establishment.

How are these desiderata of a well-planned abattoir met in the Belfast plan? Admittedly the site provided is too small for the purpose, and the City Council has been warned of this defect by a report from the City Surveyor and by its condemnation by Dr. H. W. BAILIE, the Superintending Medical Officer of Health; by Dr. CLIBBORN, of the Local Government Board; and by Dr. MCCAW, President of the Ulster Medical Society. This defect of the site might have been palliated by the adoption of a two-storey abattoir, as has been done at Dresden, Frankfort-on-Main, Gorlitz, Neisse in Germany, and in the British examples at Glasgow, Leeds, and Birmingham. The city fathers of Belfast seem, however, to have made up their minds that they will have a one-storey arrangement, room or no room.

How is the freedom from taint of the killed meat ensured? The hanging rooms are in the middle of the site, surrounded by the slaughter-halls, and these by the lairages and pens, thus enclosing the meat-hanging rooms on all sides with sources of taint and infection. This disposition alone is amply sufficient to condemn the plan now put forward.

Cruelty to animals seems to have been one of the objects sought rather than avoided in the arrangement of the plan. A considerable proportion of the lairages are placed below the arches of an overhead street with tramcars and other traffic thundering above the poor beasts in their strange quarters, so that they may be as much frightened as possible. The main entrance for cattle is at the extreme end of the site, so that they may have to be driven right round the whole establishment before they reach their lairage or pens, and on their journey they pass the stables and the byre and slaughter-house for diseased cattle. Thus there is every opportunity for the animals

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CONCRETE RESIDENCE, LOS ANGELES.—GARDEN FRONT.

to become frenzied almost beyond control, which is not only dangerous to those engaged, but as we have already pointed out, highly detrimental to the quality of the meat. Then the swillings of the slaughter-pens are in the plans shown to go to an open drain in the passage between the lairages and the slaughter-halls, so that the smell of the swillings, charged with reeking hot blood and vestiges of slaughter, meets the nostrils of the terrified beast as he is drawn across the passage. It is needless to point out how much such a condition of affairs adds to the danger of slaughtermen and hence to the harshness and even brutality with which they are likely to treat the beasts that come under their hands. All of which is objectionable not only from the point of view of morality and humanity but of business. Bad treatment of animals means inferior quality of meat. Verily if this abattoir is carried out as proposed Belfast will be a city to be avoided by all tourists and visitors who are not obliged to go there and who have some regard for their digestion.

There are other considerations, possibly less important than those we have placed as the first elements of a properly planned abattoir, but still of vital importance to anything like a decent plan. The arrangements for the reception of animals sent in by butchers for slaughtering are of the crudest, and quite a numerous staff will be needed to assist the drovers, who must leave their charge in the care of someone whilst they do their necessary business in the offices. The defective planning of the access to the lairages and pens that we have already noticed in connection with the question of cruelty is, of course, a further violation of the principle of convenience for butchers and their drovers.

A subsidiary entrance for beasts from the cattle market adds to the general confusion. These beasts, if the accommodation has been rightly proportioned, might reach their lairages without coming into collision with those entering from the main entrance; but access to the sheep pens and piggeries is impossible without encountering the streams of oxen, unless it is intended that the sheep and pigs should be driven by the ways used by butchers' carts taking away meat. Thus the convenience of butchers and drovers appears to have been badly considered. The provision of sanitary accommodation for workers is about as defective as could possibly be arranged—at one end of the site, so as to be far from those engaged at the other, and close to the to the meat-testing department, whose efficiency it can scarcely enhance. The veterinarian's offices are next the principal entrance, presumably with the view of allowing him ready inspection of animals entering there, but they are as far as possible from the entrance from the cattle market and quite secluded from the work of the abattoir, so that there is no chance of overlooking what is going on in the slaughter-houses or the hanging rooms. In fact, the administrative offices seem to be so located as to present the maximum of difficulty for supervision. There might be a bull-fight, or a murder, or the grossest cruelty going on and the chief officials might be in blissful ignorance.

It cannot be consideration of cost that is leading the City Council of Belfast into approval of so defective a plan, as they propose to spend at least 32,000*l*. on the first section of an abattoir for a town of 350,000 inhabitants; whereas Leeds has provided itself with a complete model abattoir to serve a population of 417,000 at a cost of 25,400*l*.

Thus it will be seen that Belfast's City Council is committing itself to an utterly unsatisfactory plan, and one that, if carried out as proposed, will make Belfast's abattoir a laughing-stock and by-word to the world.

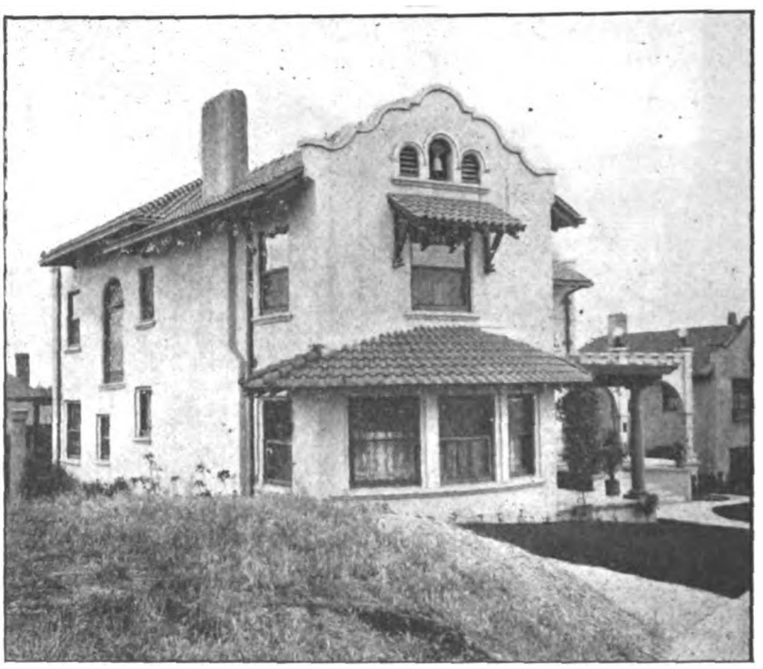
NOTES AND COMMENTS.

SNAP-SHOT drawing, on which, as reported in our last week's issue, Mr. T. R. ABLETT, founder and art director of the Royal Drawing Society, lectured at the Shepherd's Bush Exhibition as useful "for engineers and architects," appears to us to be valuable as a correction of the tendency that the everyday work of geometrical drawing of plan, section and elevation has to cramp the architect's, and especially the young architect's, ability to realise the aspect in three dimensions of what he draws.

THE work of the Royal Drawing Society is primarily to foster and encourage the natural instinct of children to draw, not necessarily for the purpose of increasing the number of artists, but for the development of the faculties of observation and imagination. These faculties are obviously of high importance to the architect, and without them he cannot be really what he professes and aims to be, an architect and an artist. Hence anything that helps to increase his power of observation and imagination is valuable.

SNAP-SHOT drawing is practised in the method of the Royal Drawing Society by the presentment of some object or group of objects for a limited time to the eyes of the scholars. Then the actual vision being removed, the snap-shottists draw as much as they can remember in a definite time. Thus that particular form of memory which is known as visualisation is exercised, and concurrently the observation and selection of salient points in the subject snap-shotted. In practising snap-shot drawing it is absolutely essential that the draughtsman should re-

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CONCRETE RESIDENCE, LOS ANGELES.—FRONT VIEW, NORTH END.

produce from the solid and not from a drawing of the object by himself or someone else. The practice of snap-shot drawing is likely to assist the young architectural student in designing buildings, as he should do, in perspective, to realise his conception of a building or part of a building in three dimensions, that is, in the solid.

WHETHER it is worth while for those of the public who are about to erect buildings in which cost is a consideration to adopt fire-resisting construction is an important question when a building has to be made to pay its way. Hence the carefully considered article by Mr. J. P. H. PERRY in *The Engineering Magazine* on the comparative cost of reinforced concrete and ordinary construction in mill buildings is both interesting and useful. Although Mr. PERRY's figures are based on American practice and experience, the conclusion is valuable at which he arrives, that a concrete building will save each year 2 per cent. over an ordinary mill building whose original cost was 10 per cent. lower.

THE State Board of Health of Maine, U.S.A., has issued a bulletin in which is recorded the result of experiments in the Agricultural Experiment Station at Storrs, Conn., on the number and nature of the bacteria that the common house-fly carries with him. Typhoid, tuberculous, and other baneful bacteria were found in large numbers, and the house-fly, like the mosquito, stands convicted of being an active disseminator of disease. Filth is necessary both for the propagation and the existence of the house-fly, and therefore the need for cleanliness is insistent. But as it is practically impossible to eliminate from the outside environment of buildings all opportunity for the house-fly to breed, door-screens and window-screens should be extensively used to exclude flies from our houses.

OLD SARUM is now in process of being explored by excavation under the auspices of the Society of Antiquaries, with the sympathies of the Wiltshire Archæological Society. The foundations of the Norman buildings are to be first investigated, with some expectation that they may reveal traces of an earlier period, possibly even of the Bronze Age. Any objects of interest will first be exhibited on the site and afterwards committed to the care of the Dean and Chapter of Salisbury. Amongst the first of these objects are three silver pennies of Edwardian date, which have already been discovered.

A CONCRETE RESIDENCE IN LOS ANGELES.

THE progress that is being made in the use of concrete is a topic of the greatest interest in the building and industrial world. It is not so very long ago that America heard of its first reinforced concrete construction. Then it caused wonder and astonishment because of the results accomplished, but notwithstanding that that was not too long ago to be still in the public mind, the people have come to expect anything and everything of this method of construction.

True, there were mishaps and disappointments when builders attempted to rear structures of reinforced concrete when that material was new to them. That in itself is the reason for it—the fact that it was new to them; but those accidents and disappointments only served to make more certain the future of reinforced concrete. Such incidents only served to demonstrate that the utmost care and precaution must be taken not only with concrete, but with all classes of building material.

While it is but a step from the early days of reinforced concrete to the present time, the varied and numerous uses to which the material is now put tells its own story of the favour with which it is regarded and the success which has accompanied its use.

What reinforced concrete will do in home construction is to be seen on Ocean View Avenue, in the residence of F. A. Urban. While there are now many houses in Los Angeles of concrete structure, the dwelling of Mr. Urban is the first one to be entirely built of reinforced concrete. It cost about $26,000, and is designed in the so-called "Mission style."

The home contains two storeys and a basement. It is planned so that every inch of space is available and every room is an outside one. The walls and foundations are wonderful examples of solidity and strength, the builders declaring that none of the elements could wear or shake them.

All footings, walls, piers and columns were built of concrete made as follows:—Sharp clean sand, two parts; gravel, fine, under 1 inch in size, three parts; and cement, one part; turned three times dry to well mix, then wetted and turned twice, and immediately put in the forms prepared in the ordinary way to receive same and tamped solidly, so that no voids existed. The foundations are 13 feet below the level of the land, and are 3 feet wide at the base. The walls to the first-floor level are 18 inches thick, while above that they are 12 inches.

The floors of porch and side porch were made of concrete 3 inches thick, and on top of same was placed a mortar mixture—two parts screened sand and one part cement, tinted as desired, trowelled off smooth, and marked off in squares 12 inches by 12 inches, the floor having a slight fall outward.

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CONCRETE RESIDENCE, LOS ANGELES.—REAR VIEW.

The concrete steps were finished in same manner, with treads 14 inches wide. All floors in basement are of cement. All walls were reinforced with ½-inch steel rods, and the two walls above bay-window openings were further reinforced with three 1-inch steel rods each; the walls above 5 feet, windows and doors were reinforced with three ½-inch steel rods to each opening. The chimneys are all of concrete. On the first floor are six fine rooms, all very large and finished in mahoganised white cedar. The reception hall is 18 feet by 30 feet, and the reception room 16 feet by 27 feet. The den is 14 feet by 16 feet, and the dining-room adjoining 17 feet by 23 feet. There is a little breakfast-room 10 feet by 12 feet, and a large kitchen.

There are six rooms on the second floor, finished in white enamel, the walls being tastefully decorated. The rooms are well ventilated, and heated by an Equator steel furnace and Humphrey automatic water-heater, the latter furnishing hot water for the entire house. The door locks and trimmings are of solid brass. All the rooms have coved ceilings, with the exception of the breakfast-room and den, which have mahogany beam ceilings. In the bedrooms are complete equipments, including lavatories with hot and cold water.

The place is fitted throughout with electric lighting, with gas as an auxiliary if required, the fitments being highly artistic, and where possible of cut glass.

Six hundred and seventy-five barrels of cement and 5,000 lb. of steel reinforcement and hundreds of eastern tiles of special design were necessary in the construction of this house. All work was done by day labour, the job taking seven and a half months to complete, every part being made perfect as far as possible, and every convenience known to modern house construction has been installed, including even the Mission bells to complete the effect.

CHURCH AND STATE.

By VIATOR.

IT is perhaps unnecessary to remark that this article is in no way political, for it would not under such circumstances be suitable for a professional magazine of the character of *The Architect*. The object is to discuss the preference of one style of architecture over another for buildings devoted to the purposes of Church and State, and to discover if possible the reasons underlying such preference.

We would not wish to be dogmatic—a quality that has been aptly described as "matured puppyism"—in the following research; modesty is the writer's guide, and intelligent receptivity should be accorded by the reader.

In earlier days, when a nation practised its own style and when those of other countries were generally unknown outside their respective territories, buildings of all classes were perforce designed in the one style, regardless of its inherent fitness from the critic's standpoint. We must walk warily here if we are to avoid a pitfall, for what is to be understood by inherent fitness? If a nation exhibits its own type of art—be it severe, bulbous, elegant, lavish, dignified, or otherwise—surely (some would urge) that nation thus expresses its attitude towards the passing hour, passing events and towards history in the making, and so best realises posterity's claims upon it. This argument is of little worth, if any; what it amounts to is that one nation is inherently (or temporarily, perhaps) better adapted for the display of one particular phase of man's complex temperament, such phase being best expressed in one particular class of building. This may be made clearer possibly by what follows.

The attitude of the ancient Greeks towards religion, art, dialectic and rhetoric is worthy of consideration. Their Pantheon was peopled by a mythological crew of demonic divinities, who were actuated by human passions and were willing, in consideration of bribes, to divert the otherwise proposed course of events. Originally these divinities merely symbolised various forces and propensities of Nature, but after a lapse of time they received an accretion of individual and divine power. The Greeks treated their gods and goddesses with a cool aloofness of passion that has in it an amusing element; there was no religious ardour such as is now understood, and characters like Socrates were not numerous enough to affect the general racial characteristics, the latter including many interesting and even fine qualities, though amongst these we do not find religiosity. This being so, what wonder is it that the Classic temples, however much we may admire them as works of art, do not appeal to our religious sense? They leave us sensuously cold and uninspired and conscious of the insincere religion that accompanied their production. Insincere! That is a most suitable adjective to use, for as it well defines the Grecian attitude towards ethical matters, so was the opposite quality—sincerity—the potent factor in all that concerned their art; and it is directly due to this unaffected bias towards the fine arts that the Greeks produced buildings which cause beholders to forget purpose and fitness in the rapt artistic admiration engendered by the other essential qualities of good design.

Examining further we may note the Athenian love for academic debates, their rigorous adhesion to and devotion for good laws, their virile belief in the *mens sano in corpore sano*; and thus we learn to realise the fact that in these matters their art aided the sense of fitness instead of opposing it. For though the academic qualities of their religious buildings served to express in the main their own attitude towards religion, we hold that such is not the natural or rational attitude. On the other hand, the dignified sedateness and the restrained beauty of their secular public buildings were more worthily and suitably decked in Classic garb than they would have been in any other known to the children of men, Renaissance alone excepted.

Though Roman as compared with Grecian art was somewhat debased, yet it possessed the same elemental features and a similar aspect in regard to religion up to the days of Constantine the Great. But the Romans developed a love of luxury unknown to the Athenians in their palmy days, and this taste acted adversely respecting the architectural design of many of their public buildings, though bathing establishments and places of entertainment would benefit;

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and in this connection the Pantheon at Rome, regarded as a hall attached to public baths, has indisputable claim to admiration, whilst viewed as a temple it is unsatisfactory.

Following upon those remarks that child of Classic architecture known under the name of Renaissance is similarly less fitted for the expression of religious ideals than are those styles which bear the stamp of indigenous religious fervour. And it is to be observed generally that people are more soulfully impressed in places of worship designed in one of the Gothic styles, even if at times they are more intellectually moved by Renaissance churches.

Before, however, adverting to Gothic art, a few remarks may be accorded to early Christian and some other styles, and to the position they hold in regard to inherent suitability for Church or State architecture. Respecting early Christian populations there cannot be two opinions as to the sincerity of their religious tenets, a sincerity not necessarily reflected in their ecclesiastical buildings for reasons now to be stated. Where persecution of the believers was not actively exercised, it was nearly always to be anticipated; consequently religious enthusiasm expended itself in acts of devotion and martyrdom, though it was at the same time recognised as impolitic and unchristian to invite the imposition of that thorny crown by any show of luxury such as might provide a lever wherewith the persecutors could raise a specious case against the followers of the new faith. Not indeed that there was much chance of being luxurious, as the early Christians were for the most part poorly endowed with the world's goods, and were thus deprived of the means of gratifying a natural desire to honour their Master by the presentation of choice gifts. Policy and poverty thus combined to prevent the early Christian churches from being places of grandeur. As a result the buildings erected were mere *aulæ* or *basilicæ*, the plan being that of the old heathen Hall of Justice and not infrequently structurally decorated with portions of old heathen disused temples; of necessity the result was nearly as cold and formal as Classic art itself, and it could in no way interpret the mysticism attaching to Christian tenets.

But (it may be remarked) Oriental art is not cold and formal; Chinese, Japanese, Byzantine, Indian—these are not cold and formal, nor actuated in regard to expressing religious sentiment by any such restrictions as just detailed. To dispose of the first-named it is well-known that the Celestials have been conservative in art as in religion and everything else from the early days of their very ancient empire; any reforms and progress observable in their territories have been forced upon them by external pressure. Though a very ancient civilisation—or perhaps because of its antiquity—it is one that other nations regard as childish in many respects; with childhood, crude ideas as to form and colour go hand in hand. The religion of Confucius is one apart from all other known creeds and is perhaps justly given effect to by the fantastic designs of Chinese art. In fact, this nation is adapted (and possibly better adapted than others) to express garden architecture and similar work, but it cannot do justice to Church or State buildings.

Any nation also whose taste for luxurious display pervades all its actions at home and abroad, a nation that regards the Ruling Power as supremely sensuous and the future state of existence as a life of voluptuous pleasures, any such nation is but ill-adapted to express religious or State architecture in a manner that would adequately realise their respective claims; and consequently, under the ban of unsuitability, we must include Oriental styles generally.

Byzantine architecture gives evidence of the co-operation of true religious feeling and expression, though for the full development of this we must seek the Gothic styles. In the eastern empire of Constantine buildings were erected whose planning was no less serviceable for the proper exercise of worship than that of the early Christian buildings, and whose architectural treatment, unshackled by considerations either of prudent seclusion or of economy, yet evinced an artistic avoidance of exuberance combined with a justifiable use of colour and of structural design.

It is, however, only when the period of the later Romanesque work is reached that a distinctly expressed ecclesiasticism is observable. Perhaps the main factor responsible for this is the religious ardour arising after the close of the tenth century of our era, when people were relieved from the fear that the world would end with the close of the year 1000. The bar safely crossed, the nations put out to sea full of hope and thankfulness, and being more simple-minded and direct than those of to-day they were not afraid to express their love and gratitude in buildings devoted to their religious worship.

It must be evident that where the idea of a God is of an exalted Being inhabiting space and far removed from the pettinesses of mortals, this will best find expression where no cramped effects are to be seen; and as the curious notion has ever been prevalent that heaven is above us, not around us, this would again be best expressed by a lofty building.

But there is another point to bear in mind as probably influencing the adoption of loftier church interiors, and this is the introduction of the organ fairly contemporaneously with the advent of the eleventh century. To give due effect to the tones of this majestic instrument a spacious building is required.

At the same time also (or perhaps somewhat earlier) there arose from whatsoever cause a general disuse of Autolycan trifles from ancient heathen edifices such as had formerly been introduced mosaic-wise into Christian churches. A certain "feeling" of Classicism in the ornament was to be expected, but progressively this gave place to other forms, not intrinsically better by any means, but as having no resemblance to what had preceded they kept the mind of the observer free from any suggestions of heathen work. Anything in the nature of affectation in this matter of suitable mouldings and ornament is to be deprecated; the bowtell, dog tooth, cat's head, roll moulding, diaper, &c., are no more expressive of religious feeling than are the echinus, scotia, egg-and-dart, honeysuckle or acanthus. Where the difference arises is in the workmanship, mediæval art showing an individuality, a freedom from undue restraint, a lack of cold formality, altogether opposed to the practice of Classic art.

The desire to obtain increased proportionate height prepared the way for the use of the pointed arch; and here, once again, is apparent an added interpretation of religious ideals. With the semicircular arch the eye is held within a confined space, travelling from one springing point to the other almost unconsciously; with the pointed arch the effect is just the reverse, the eye tending to continue the course of flight upwards. Quite unconscious interpretation we may believe this use of the pointed arch to be, but none the less effective. The idea that pointed architecture had its origin either in leafy avenues or in intertwining round arches may be set aside as being more plausible than probable.

A reference was made earlier to the mysticism attaching to Christian tenets; this may be contrasted with what may be termed the "mystery" connected with some of the more remote faiths wherein the prevalent idea was that the gloom of the temple interior should be in direct ratio to its sanctity. This effect of gloom and mystery was obtained by two methods, if not three; the ancient temple consisted of a congeries of rooms progressively narrower, lower and more shut off from the light of day as the innermost sanctuary was approached. This could not but result in a tendency to making a terror of religion, and the hierarchy enhanced this impression on the lower orders by calling to its aid the use of scientific tricks and mechanical subtleties.

How different to the more modern ideal of concentrating the resources of art and shedding a brilliant light upon the central point of attraction in a place of worship, as most effectively seen in the chancel of a church. The soul of religion is not wrapped in mysterious veilings, and the faith of worshippers is invited to satisfy its cravings intelligently, not blindly. The accidental mysticism arising from what has been termed "dim, religious light" has been perhaps unduly insisted upon, as the feeling is probably the result of environment.

The fitness of pointed architecture for ecclesiastical buildings having been analysed in brief, what may be said about its suitability for State edifices? Firstly, it is evident that the more elevated the purpose of the building the more should it express dignity, formality, reserve, stateliness and continuity. It would be unpardonable to suggest that in most Governmental methods there is any continuity of policy in the generally accepted sense, and yet, on the principle that "under all circumstances the King's Government must be carried on," there is an underlying idea of continuity that should find expression in the "frozen music" of architecture. In Gothic art there is a lightness of touch, a certain irresponsibility and other qualities mentioned earlier, that militate against its fitness for the expression of State architecture; and whilst these qualities may recommend it for private and for certain public buildings, yet it is conceivable that other qualities may prove adverse to its free use even for these purposes.

The English Houses of Parliament are well adapted to point a moral, though they do not adorn the tale of nine-

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teenth-century progress. Who does not recall Carlyle's denunciation of them ("Latter-Day Pamphlets"), written as the time of their completion approached? "A wilderness of stone pepper-boxes with tin flags atop . . . if this is ideal beauty, except for sugarwork and the more elaborate kinds of gingerbread, what is real ugliness? Can any earnest soul pass them without mentally exclaiming 'Apage!' and striking a pious cross in the air?" So far Carlyle. Dignity (that is, the expression of it) is at a discount, and where the whole surface is cut up into restless elaboration the expression of continuity is impossible; and with the absence of these is also to be noted the absence of formality (though not of stiffness by any means), reserve and stateliness.

When our eyes are turned to the English Law Courts in the Strand we see another phase of Gothic, also unsuitable. The Palace of St. Stephen's (criticised in the preceding paragraph) is Classic clothed in Gothic garb; the Law Courts renounce Classicism altogether and presents to passers-by a confused jumble of buildings that quite fail to typify the orderly process of law.

But when we regard the various blocks of Government offices within sight of St. Stephen's, their fitness is at once apparent, and we are in a position then to establish the justice of our adverse criticisms above and to absolve ourselves from any charge of jaundiced views.

In State architecture it is proper to include Royal palaces, where the predominating influence may indeed be traced to their public character, though the privacy attaching to a home must also find due expression. We may exemplify three Royal palaces here—one at Madrid (not the Escurial), one at Vienna, and one in England; all three are Renaissance in style. The Spanish palace exhibits a dignity, formality and symmetrical disposition that relegate it in appearance to the rank of a worthy Parliament House, for it bears no impress of domesticity. The Vienna palace, though less formal, shows just as few signs of the domestic character. Hampton Court Palace, however (we refer to Sir Christopher Wren's work there), by its greater freedom of treatment (and more particularly in the use of cheerful red brickwork as an integral portion of the design) acquires an air of combined stateliness and homeliness which in conjunction with its noble proportions and fair surroundings at once sets the palatial seal upon it and inspires in the beholder a sense of its absolute fitness. Gothic art in one or other of its phases may serve for private palaces, but with domestic architecture in general this article is not concerned.

There is one aspect yet to be considered before bringing this short analysis to a conclusion. When we talk of the qualities fitting for a certain building we are of necessity biassed in favour of, or at any rate predisposed to, a view that has grown with our and our country's growth, and this may be very different from the views held elsewhere and by other people. A popular example may render clearer what is here meant. Taking into consideration the "points" of beauty in a member of the so-called gentler sex, we are conscious of the fact that the sentiments of the Western nations in this respect differ widely from those of the Oriental races. In Turkey the ideals of womanly beauty consist in plenty of adipose deposit and henna-stained finger-tips; in China we are accustomed to connect long and sharply-pointed fingernails and the smallest of club feet with the Celestial ideals of womanly beauty. Even the Western nations have divergent notions; for whereas we regard with disfavour an English girl with a moustache, a Spaniard views his countrywomen as thereby adorned.

Consequently we must end, as we commenced, by avoiding dogmatism, merely submitting the foregoing considerations as a reasonable explanation of the general qualities of architecture in its relation to Church and State.

ANCIENT MEXICO.

AT the recent meeting of the British Association at Winnipeg, Miss A. C. Breton presented the following short papers:—

Race-types in the Ancient Sculptures and Paintings of Mexico and Central America.

The different race-types in the ancient sculptures and paintings found in Mexico and Central America form an important anthropological study. An enormous mass of material, evidently of many periods, includes sculpture, archaic stone statuettes, the portrait statues and reliefs at Chichen Itza, the Palenque reliefs and the series of magnificent stelæ and lintels at Piedras Negras, Yaxchilan, Naranjo, Copan, Quirigua, &c.

In terra-cotta or clay there are the hundreds of thousands of small portrait heads and figurines found at Teotihuacan, Otumba, the neighbourhood of Toluca and other ancient sites. Larger clay figures have been found in quantities in tombs, as in the States of Jalisco and Oaxaca; these were made as offerings, instead of the sacrifice at a chief's burial of his wives and servants. Small jadeite heads and figures, also found in tombs, show strongly marked types. If there are few specimens in gold, it is because throughout the country the Spaniards ransacked the tombs for gold. In painting there are the picture manuscripts, the frescoes at Chichen Itza, Chacmultun and Teotihuacan, and a number of vases with figures from Guatemala and British Honduras.

This material is now available for students in Mr. A. Maudslay's "Biologia Centrali-Americana, Archæology," Dr. E. Seler's collected works, the publications of the Peabody Museum, and the reproductions of the Codices by the Duc de Loubat; also in the splendid collections of the Museum für Volkerkunde at Berlin, the Mexican Hall of the Natural History Museum at New York, and the Peabody Museum.

Among distinctive types are:—The chiefs in the reliefs at Xochicales, who sit cross-legged; the little shaven clay heads at Teotihuacan; the tall, well-built priests, with protruding lower lip, of the Palenque reliefs; the fifteen caryatid statues in feather mantles of the Upper Temple of the Tigers, at Chichen Itza; and the sixteen stern warriors carved at its doors, these last similar in type to some of the modern Indians of the villages near Tlaxcala.

There are portraits of the Mexican kings on the border of a picture-map which represents the western quarter of Tenochtitlan and of the householders in that part of the city. Of female types there are the painted clay figures of Jalises with compressed heads. Some of them have short, broad figures; others are slender. Both types still survive. The queenly woman in Codex Nuttall-Zouche, and the women-chiefs of the Guatemalan stelæ belonged to a different caste to the obviously inferior women on those stelæ, fattened in preparation for sacrifice.

Herr T. Maler's most recent explorations on the borders of Guatemala have given magnificent results in the finding of thirty-seven stelæ at Piedras Negras, and at Yaxchilan twenty stelæ and forty-six sculptured lintels. The superb figures of warriors and priests indicate a race of men of tall, slender stature and oval face, with large aquiline nose, whilst the captives appear to be of a different race.

Arms and Accoutrements of the Ancient Warriors at Chichen Itza.

Chichen Itza, in Yucatan, is as yet the principal place in the region of Mexico and Central America where representatives of armed warriors are found. There was a remarkable development in the later history of the buildings there of painted sculptures and wall-paintings, mostly of battle scenes and gatherings of armed chiefs.

The stone walls of the ruined lower hall of the Temple of the Tigers are covered with sculptured rows of chiefs, who carry a variety of weapons. Of the sixty-four personages left, half a dozen have ground or polished stone implements; others hold formidable harpoons (two of them double) or lances adorned with feathers; whilst the majority have from three to five spears and an atlatl (i.e., throwing stick). These are of different shapes. One figure has armlets with projecting rounded stones. Some have kilts, sporrans, leggings, and sandals. Eleven personages have tail appendages. There are protective sleeves in a series of puffs, breastplates, helmets, and feather headdresses, necklaces of stone beads, masks, ear and nose ornaments in variety. Small round back-shields, always painted green and fastened on by a broad red belt, may have been of bronze attached to leather, as a bronze disc has been found. Round or oblong shields were carried by two thongs, one held in the left hand, the other slipped over the arm.

The two upper chambers of the same building have reliefs on the door jambs of sixteen warriors life size. They carry a sort of boomerang in addition to spears and atlatls. In the outer chamber was a great stone table or altar, supported by fifteen caryatid figures. Upon its surface was a relief of a standing chief, holding out his atlatl over a kneeling enemy who offers a weapon. The walls of both chambers were covered with painted battle scenes, in which several hundred figures are still visible. They carry spears, atlatls, round or oblong shields, and a kind of boomerang which was used by the natives in Australia about eighty years ago. It was

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HEADINGTON CHURCH, OXON.—FROM A SKETCH BY P. HUBERT KEYS.

intended for striking rather than throwing. On one wall the method of attacking high places by means of long-notched tree-trunks as ladders and scaffold towers is shown.

The building at the north end of the great Ball Court is evidently very ancient, and its sculptured walls have chiefs with spears and atlatls. The temple on the great pyramid called the Castillo also has warriors on its doorposts and pillars, with boomerangs, spears and atlatls, and so has a building in the great Square of Columns. In an upper chamber of the palace of the Monjes are paintings in which are men with spears and atlatls, and also spears with lighted grass attached thrown against high-roofed buildings. A survey of all that has so far been discovered at Chichen gives a vivid idea of primitive battle array.

LETCHWORTH—A CRITICISM.

IN view of the Housing and Town-Planning Bill, much interest attaches to Letchworth, where the first complete experiment has been made in scientific town-planning. Therefore it is interesting to quote the first report on the garden city just made by Dr. Freemantle, who is the medical officer of health for Hertfordshire, and says he recognises the importance of the experiment from the sanitary, social and economic points of view. Letchworth, which includes two other villages, comprises about six square miles, and was bought in 1903 for 151,570*l*. Then the population was only 416; now it is 5,500. In March last year Letchworth was created a single parish, with a parish council, and since then its development has been rapid. The object of the directors is to give practical proof of economic, social and sanitary value in the designing, from the outset, of an ideal city of modern conditions on practical lines, surrounded by a permanent belt of agricultural land, the whole to accommodate a mixed industrial and rural population, limited to 35,000. While the urban area of 1,318 acres, including 200 acres of parks and open spaces, is developed for all the purposes of a mixed industrial community, the agricultural belt of 2,500 acres is being in part prepared for small holdings, and in part continued in larger farms.

The position at the end of June this year was as follows:—Population, 5,500; houses built and in course of erection, 1,051; factories and workshops, 33; shops and (3) banks, 55; hotels (2 licensed, 3 unlicensed), 5; places of worship and public buildings, 9. The rates are 4*s*. 8*d*. in the £. The capital value of the buildings erected is estimated at 353,700*l*. The value of the Company's estate, apart from timber, gravel, and the gas, water and electric works as commercial undertakings, is 379,500*l*., which shows a net increment in value over expenditure of 97,000*l*. There are good shops and stores catering for the working-class trade, ample and convenient cottage accommodation, and an ample supply of labour. Last October a public market was opened, and a public elementary school is being built by the County Council at a cost of 8,975*l*.

Dr. Freemantle observes that an experimental community of this nature gives scope for original ideas of many kinds, but it is to be judged by its principles and by its result, not by subsidiary enterprises that are an incident in its growth. Opinions only differ as to the value of the several minor experiments which are put to the test in the city.

The need for rapid building gave an opportunity for experiments, independent of the main scheme, in the direction of cheap housing, and an exhibition of rural cottages in 1905 served to stimulate the provision of a large number of houses of various designs. The aim was achieved of erecting a well-designed and adequate cottage, with three bedrooms, for 150*l*., this figure not including the cost of the land, builder's profit, or architect's fee, whilst the cost of bricks and cement is low in the locality. Another exhibition in 1907 led to the erection of fifty urban cottages and homesteads suitable for small holdings, the smallest price for the former being 175*l*. and for the latter 250*l*.

Concerning these houses, the medical officer remarks that most seemed too often designed rather for elegance than for the use of artisans, and proceeds to say that the cost was often reduced only by the use of unseasoned material or thinness of walls. Nine-inch walls are "unpleasantly thin in this country."

The death rate last year was only 6.3 per 1,000, the lowest in Hertfordshire.

ILLUSTRATIONS.

NEW WEST WING, TEMPLE DINSLEY, HERTS.

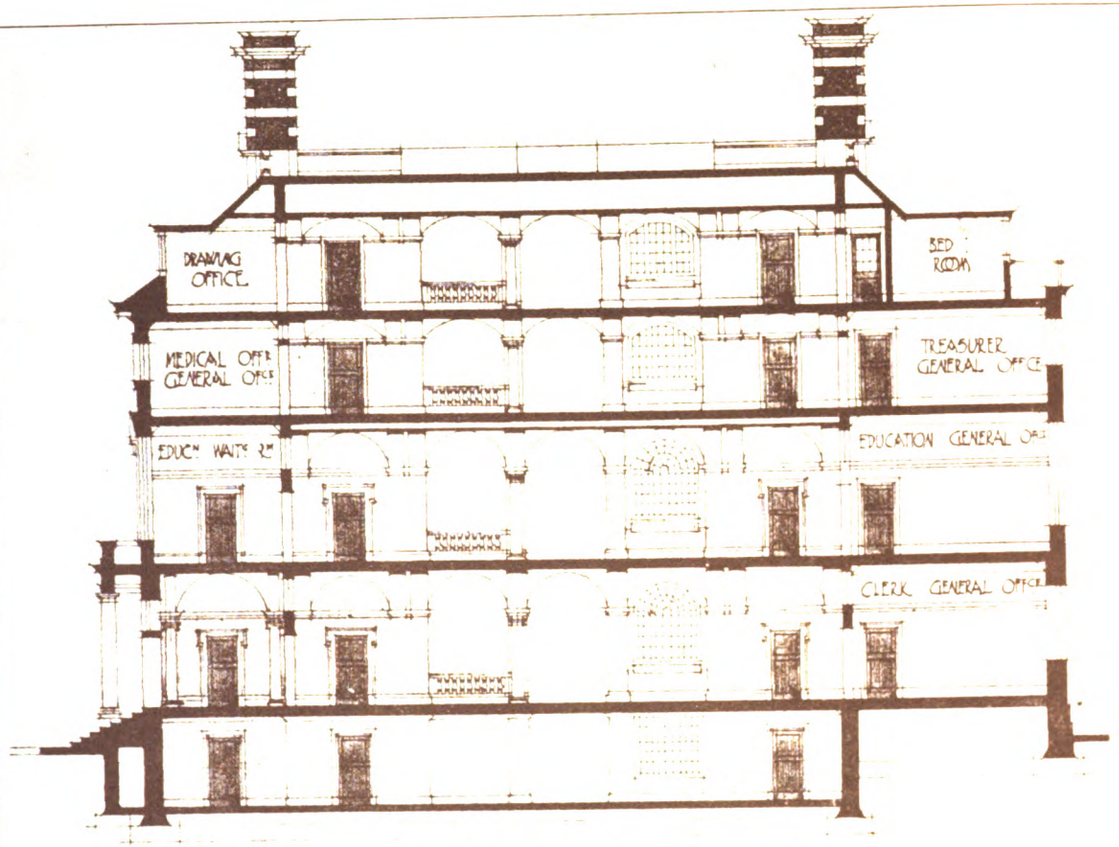
THE drawing from which our illustration is taken was exhibited this year at the Royal Academy and is an example of Mr. EDWIN L. LUTYENS's study of a particular phase of English eighteenth century domestic work, quite in keeping with the feeling of Hertfordshire.

SELECTED DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

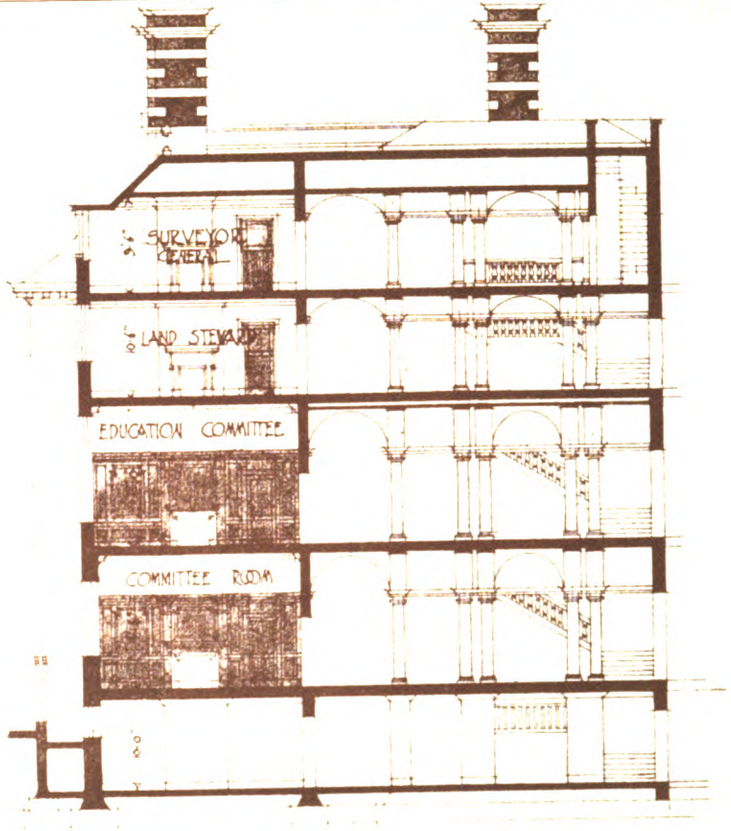
WE illustrate the winning design by Messrs. WARWICK & HALL, of which a full description appeared in our review of the drawings last week. The materials, as stipulated in the conditions of the competition, are red brick and Portland stone, with tile roofs. We shall give in a future number the designs placed second and third.

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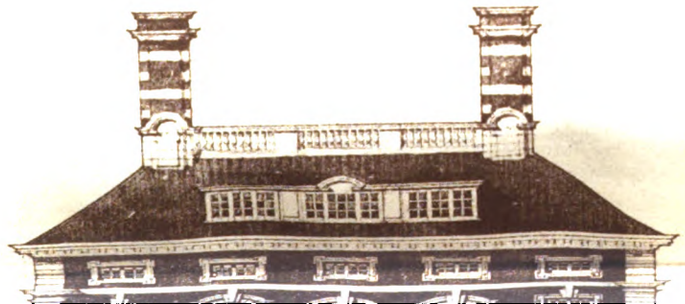
SECTION A·A



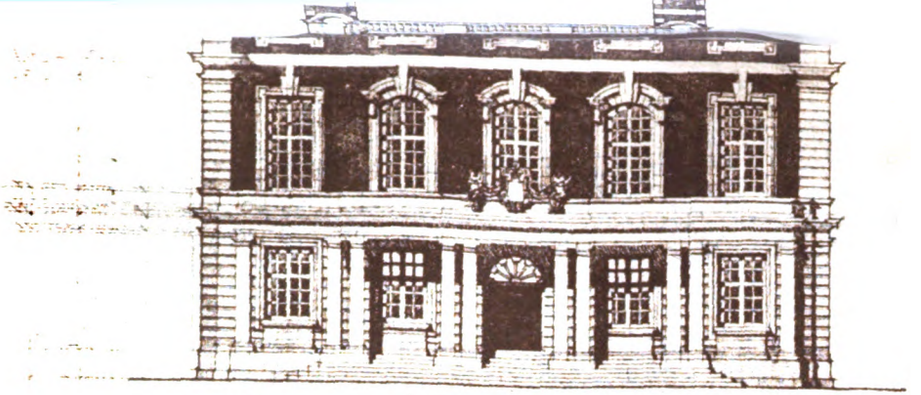
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SCALE OF FEET

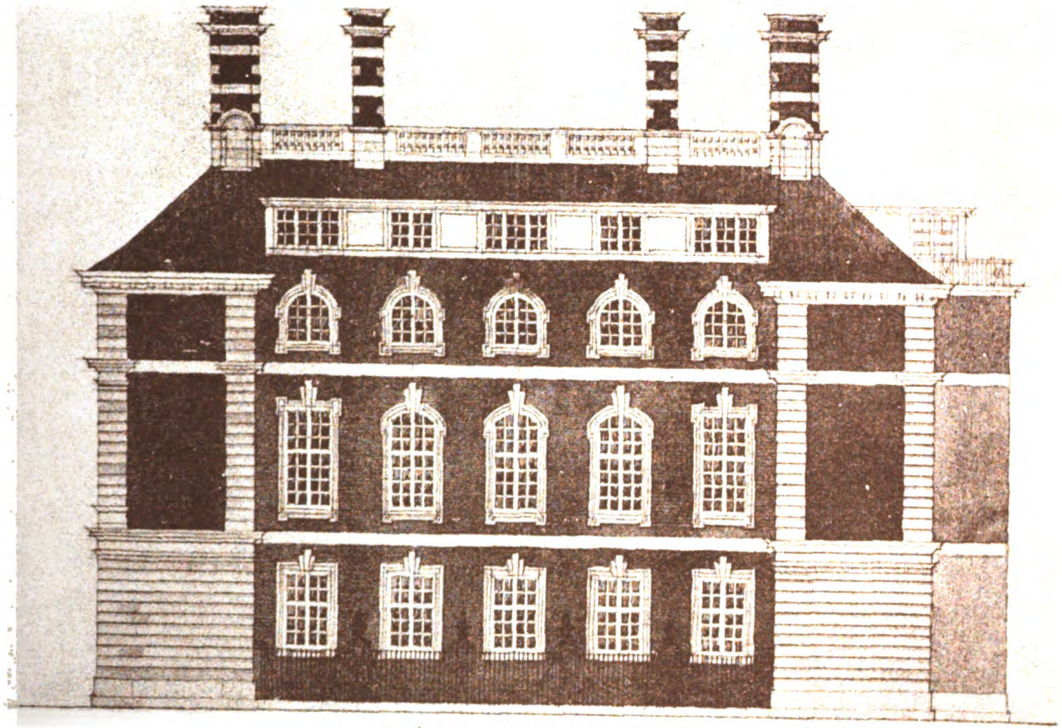
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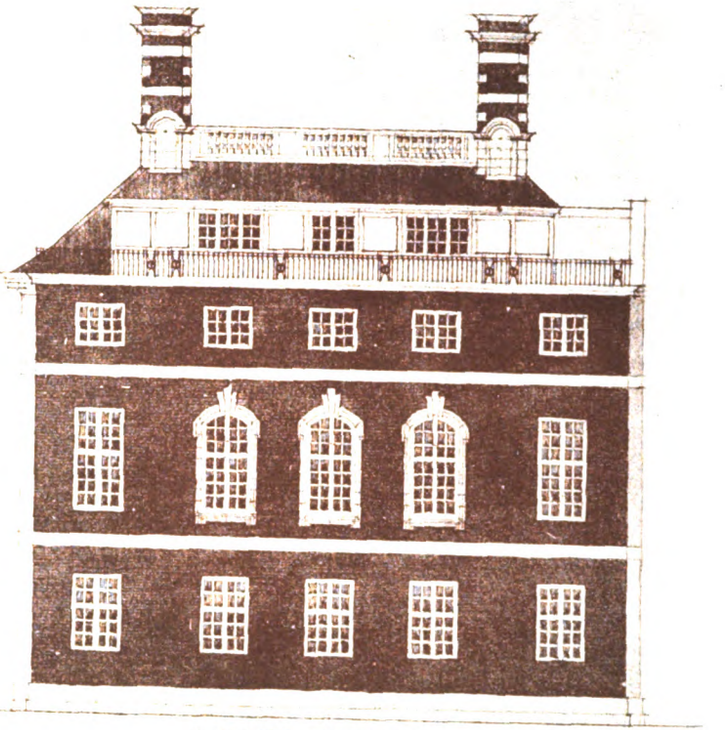
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: FRONT ELEVATION :



: SIDE ELEVATION :



: BACK ELEVATION :

INK PHOTO SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C

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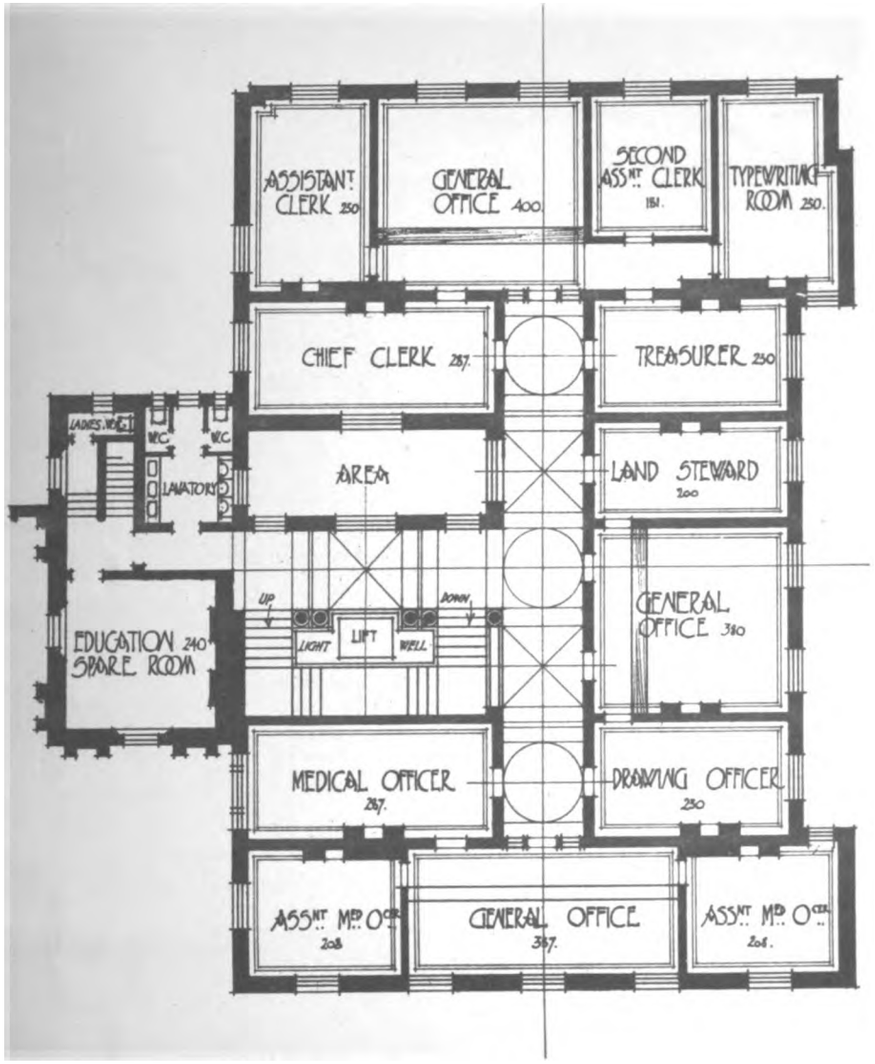
Messrs. WARWICK & HALL, Architects.

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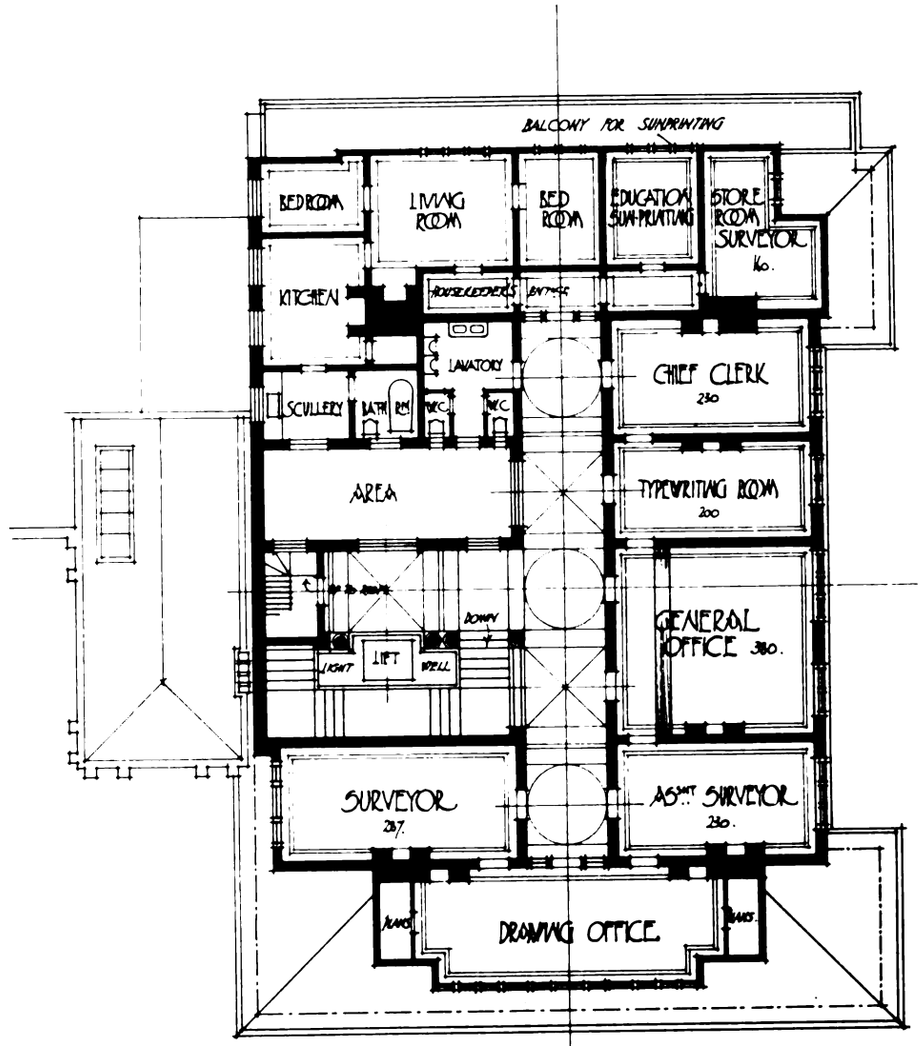
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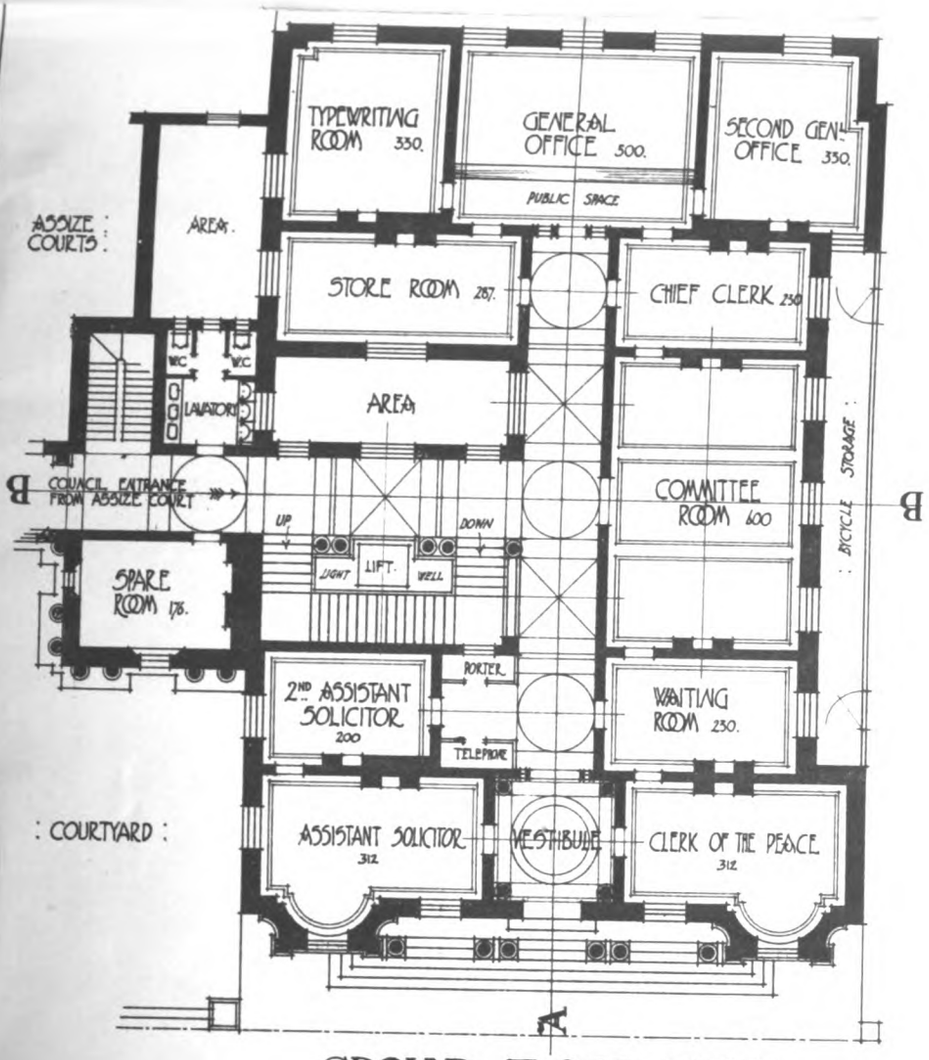
SECOND FLOOR PLAN



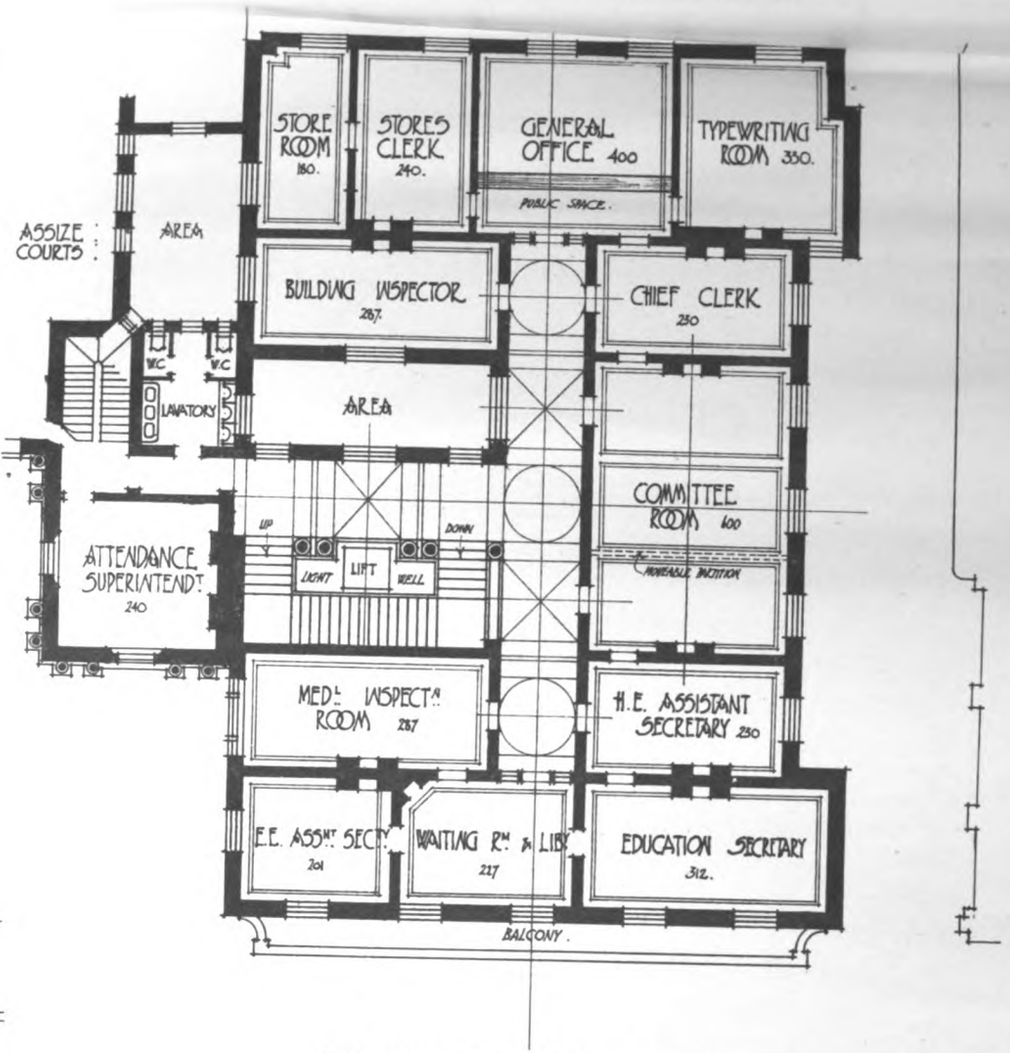
THIRD FLOOR PLAN

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THIRD FLOOR PLAN



GROUND FLOOR PLAN



FIRST FLOOR PLAN

SCALE OF FEET

0 3 10 20 30 40 50 60 70 80 90 100

THE FORBURY

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Messrs. WARWICK & HALL, Architects.

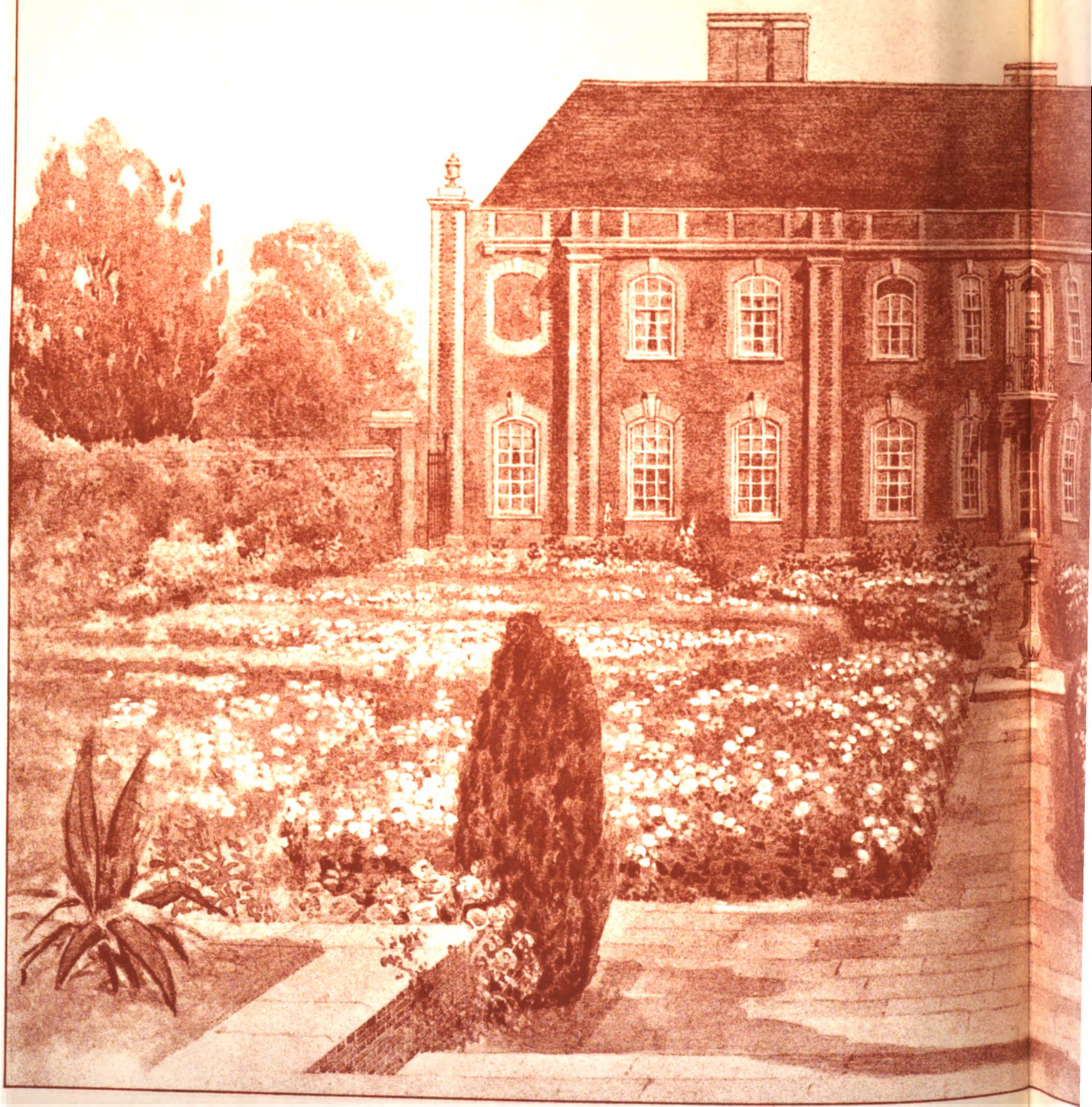
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NEW WEST WING
TEMPLE DINSLEY HERTS



NEW WEST WING. TEMPLE DINSLEY
EDWIN L LUTYENS R.I.B.A. Architect

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Oct. [illegible]t. 17th 1909.



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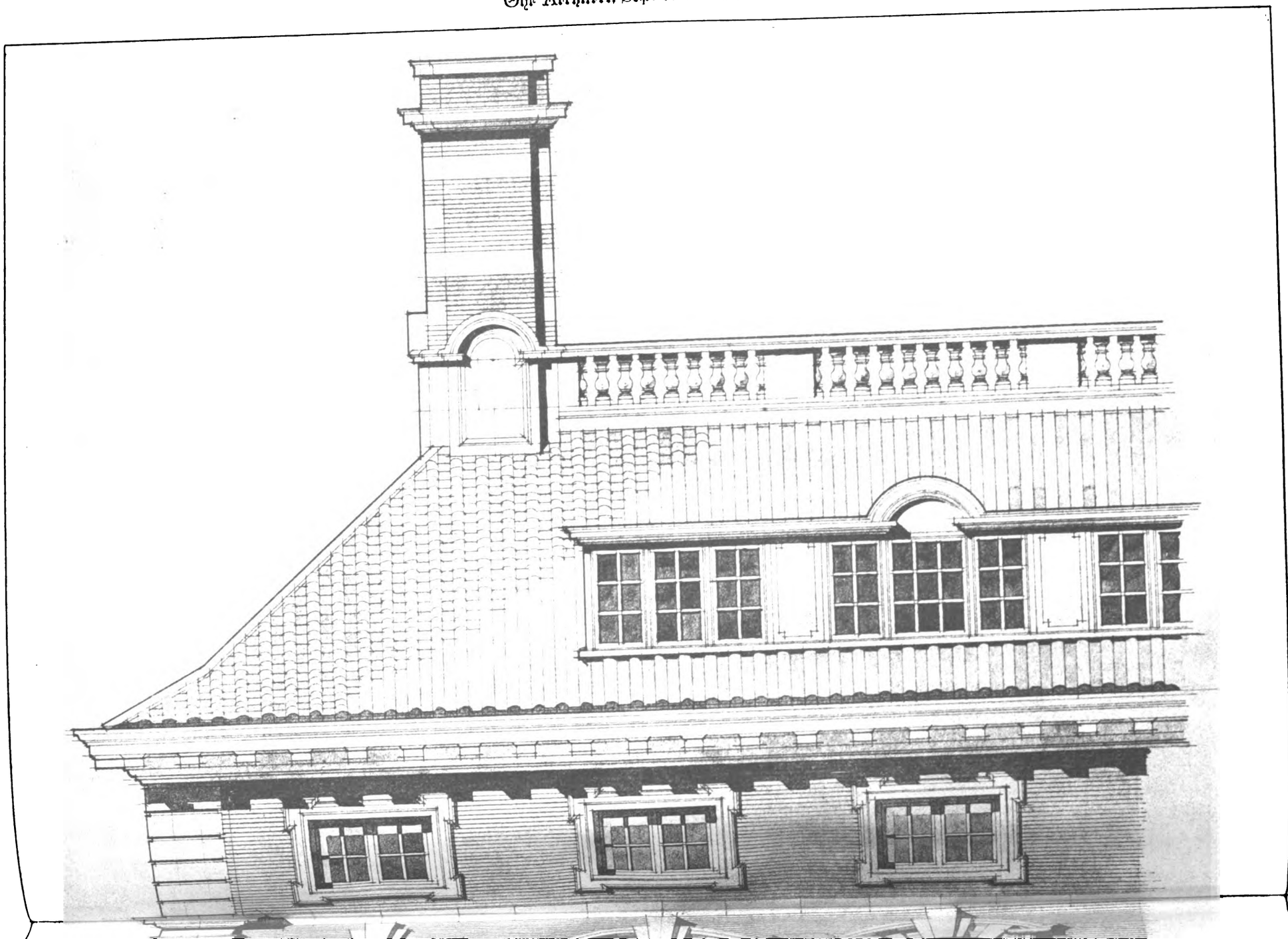
EDWIN [illegible], F.R.I.B.A., Architect

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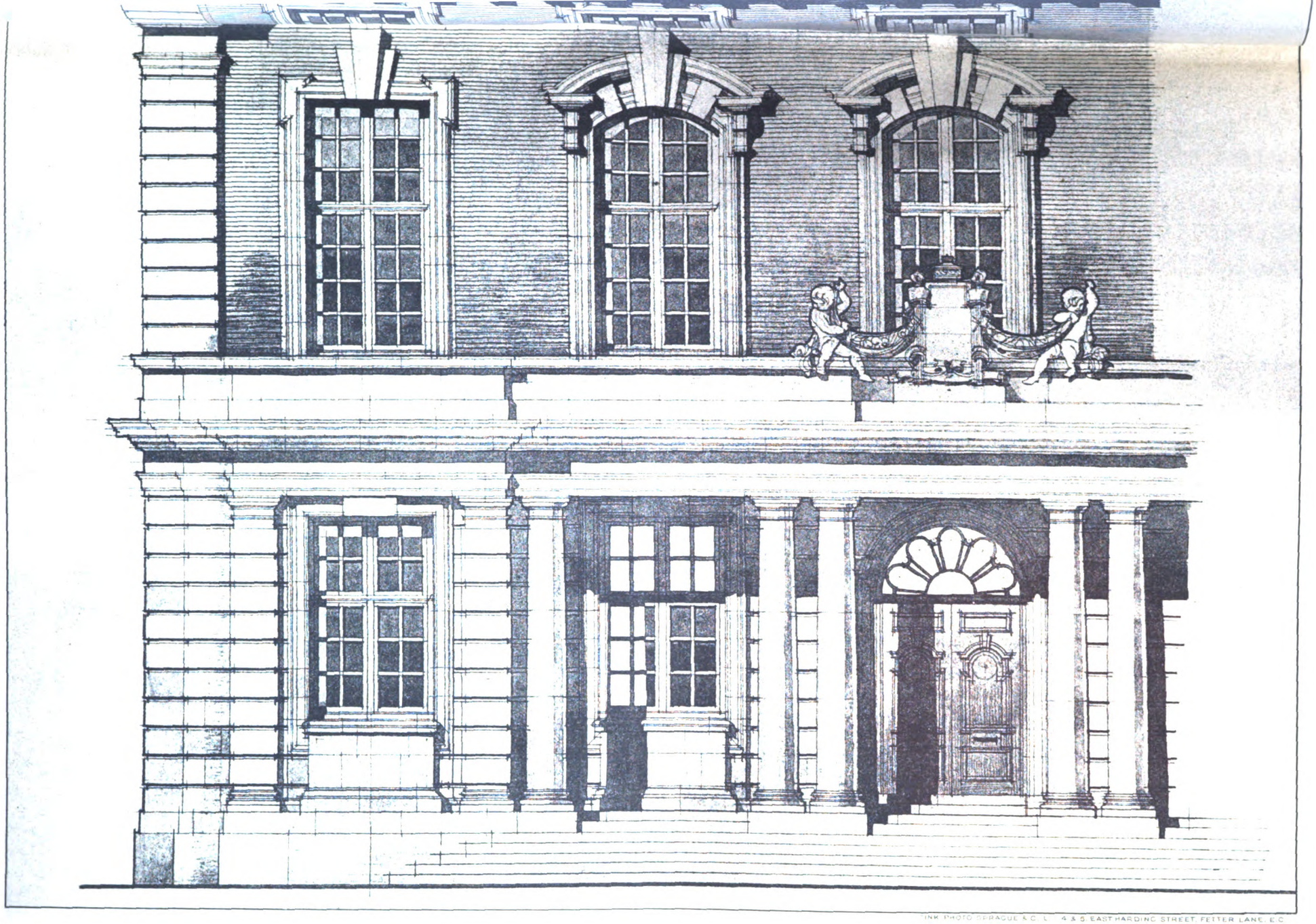
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Messrs. WARWICK & HALL, Architects.

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THE USE OF FERRO-CONCRETE IN MONUMENTAL ARCHITECTURE.*

FERRO-CONCRETE has helped to achieve great works of engineering, and so has become a factor in modern technical work. Ferro-concrete being now frequently used as a substitute for constructions previously in general use, such as flat or vault-like ceilings, beams and pillars, the question arises for the architect to what extent this peculiar material and the forms of construction dependent on it can be utilised in a suitable manner in monumental architecture. This question not only deals with technical substitutions for forms of construction already known which may be more or less justified, but it enquires also whether the peculiarity of this material does not offer important motifs which would lead to a form of construction peculiar to this kind of architecture and which would not imitate any of the older methods of construction.

None of the older forms of building furnish a model for the use of this peculiar material; on the contrary, it differs substantially from any other material or form of construction in use. Whilst up to now all materials were brought to the building site as complete entities (such as tiles, bricks, wood, iron, &c.), and were only rendered more sightly by an overlay of other material after they had been put in position, concrete and ferro-concrete construction can be produced on the site, or parts which have been finished beforehand can be put together on the building.

The manner of construction therefore may be classified in three divisions—namely, (1) Construction on suitable scaffolds in the building; (2) building material in ferro-concrete made beforehand in the factory (artificial square stones, pillars and beams); or (3) construction in a combination of Nos. 1 and 2.

As it is possible to construct by these methods vaults or vault-like forms, flat or shaped ceilings of all kinds, pillars and beams, the whole field of monumental architecture, which embraces the construction of ceilings, pillars and beams, is open to ferro-concrete as soon as it is possible to connect therewith such forms as are specifically appropriate to it, and in such a manner that the appearance of these parts of a building excludes to an expert all idea of being an imitation of construction in any other building material.

In examining the question we have therefore to look at it from three points:—

1. Construction made on centering on the building site.
2. Construction made of concrete bodies which were finished before they came to the building site.
3. Combined construction of 1 and 2.

We further have to divide the question as concerning the use and form of ferro-concrete construction into the elements of architecture, such as ceiling construction, beams and pillars, in

(*a*) Ferro-concrete construction as ceiling construction, which means ceilings more or less flat and vaults.

(*b*) Beams and pillars. Here we must take again into consideration the divisions 1 to 3 as mentioned above. Construction of beams and pillars has to be looked upon as monolithic work, not as a collection of separate parts, because when pillars and beams are constructed of ferro-concrete they are not formed piecemeal, but appear as a uniform piece of construction.

Construction of Ceilings upon Centering.

The usual manner of constructing ceilings whether more or less flat or of vaulted form consists in laying them on a centering that gives exactly the form desired. When the concrete has hardened sufficiently the scaffold is removed and the ceiling plastered and afterwards decorated with artistic ornaments in the same way as by other forms of construction. The difficulty of giving the centering other forms than the most simple is an obstacle to practically inducing the ferro-concrete to take any desired shape, even if there is an appropriate basis for it—that is to say, a mould.

However, it would be quite possible to contrive other moulds in wood and so secure an appropriate treatment of the lower surface, as can be seen by figures 1, 2 and 3. By the application of flat, dish-like moulds (of metal or wood) on the centering, a further characteristic treatment can be obtained (fig. 4). With dome-shaped ceilings naturally the diameters of the moulds must be gradually diminished. In order to avoid the cost of making new moulds for every building the use of stereotyped forms is to be recommended, which makes it possible by means of iron frames or fittings to adapt them to the size required.

Another way of developing this kind of construction is to leave openings in the middle of the moulds in order that later ornamental pieces (rosettes or the like), also made of concrete, may be attached (figs. 5 and 6); this leads further to the method of bedding in the concrete of the ceilings ornamental pieces constructed separately. By means of dovetails these pieces must be connected firmly to the ceiling under construction. The centering must be either hollowed out or be provided with firrings according to whether the ornamental pieces are to be projecting or recessed from the general surface (fig. 7). In constructing ceilings upon centering, especially if vaulted, the manner of arranging the springing of the ceiling or vault from the supporting wall must be considered. As the ceiling or vault will only act as a superincumbent load, this can be expressed by arranging that horizontal corbelling marks the separation from the wall surface, which can be emphasised by further small fascias (by means of moulds) (fig. 8).

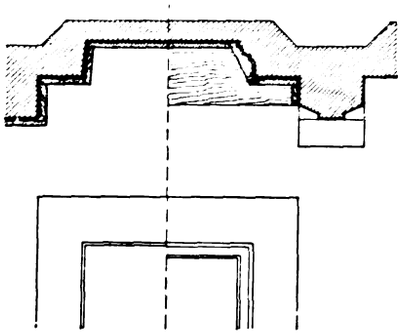


FIG. 1.

From this method of treatment we come to the consideration of other forms, which show in a suitable way connections to pillars by a further use of corbels or consoles (figs. 9 and 10).

Construction of Ceilings from Concrete Parts Made Beforehand.

The ability of concrete to adopt in a suitable mould the finest ornamental form (fig. 12), so that even ventilator and warm air openings may be ornamented, is taken advantage of by the construction of ceilings from concrete parts made beforehand. The parts so made are placed in the usual way between supports, and as the concrete has absolutely smooth surfaces there is no finishing necessary, and the work on the ceiling can at once be gone on with by painting, &c.

The first essential therefore in arranging this kind of construction is the use of such moulds as allow the casting of concrete, and thus we avoid the imitation of a wood or plaster ceiling by this construction.

The kindness of the Ministry of Justice made it possible for me to execute such ceilings at the Law Courts of Salzburg and Brünn.

The first of these was a coffered ceiling (fig. 11) with square coffers of 120 cm. in length of side for the chapel of the prison at Salzburg, weight 160 kg./m², in the form of a barrel vault of 3 to 7 cm. thickness, with iron reinforcements of 9 mm., in groups of five.

A test made under official supervision showed that the stress of 1,180 kilograms per square metre had no effect; another test, made by letting fall a piece of granite weighing 14½ kg. from a height of 5 m., caused no more than superficial damage at the place where the stone had struck. Gypsum was used in making the moulds. The result of these tests permitted the reduction of the thickness. The setting was done with white lime mortar. In this manner an absolutely firm ceiling covered with a straight roof in tiles and plaster has been constructed. If the covering is not required, the thickness of the ceiling can be still further reduced and a smaller amount of iron ties can be used.

A test made with a coffer which was painted in polychromatic cement colours, and which had been exposed to the open air for more than one year, showed no loss in the painting, which had been made direct upon the concrete without any other ground being put underneath.

A similar coffered ceiling was made for the jury-room at Salzburg, weighing 154 kg./m². (fig. 13). In this case the ceiling was constructed with a cove connecting it to the wall surface.

For the main staircase in the Law Courts at Brünn (fig. 14) a concrete ceiling with deep cove was executed; the

* Translated from a lecture given at a general meeting of the Austrian Society of Engineers and Architects by Alexander Wielemans Edler v. Monteforte, architect.

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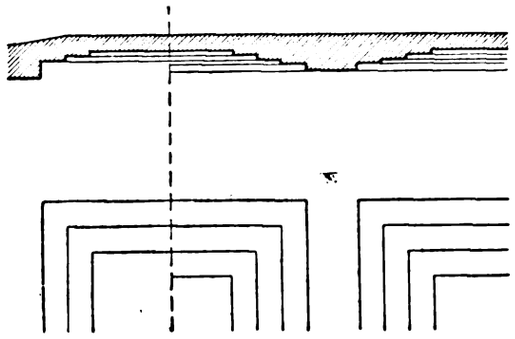


FIG. 2.

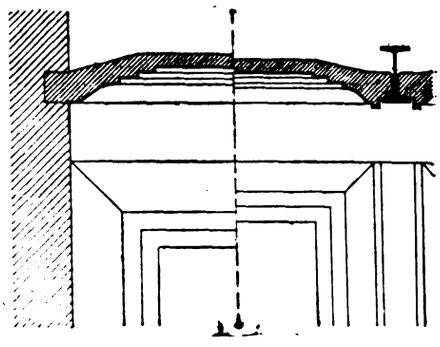


FIG. 3.

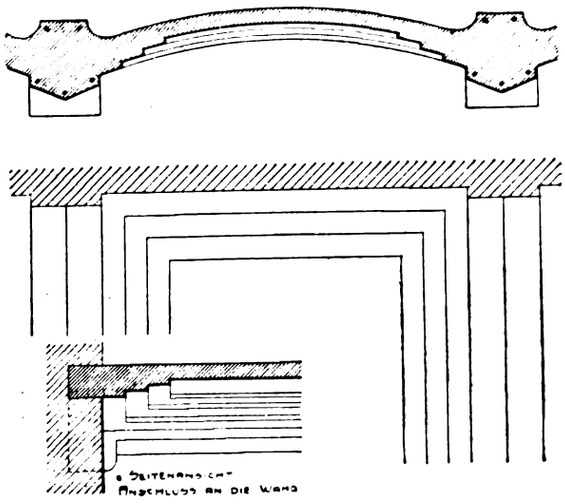


FIG. 4.

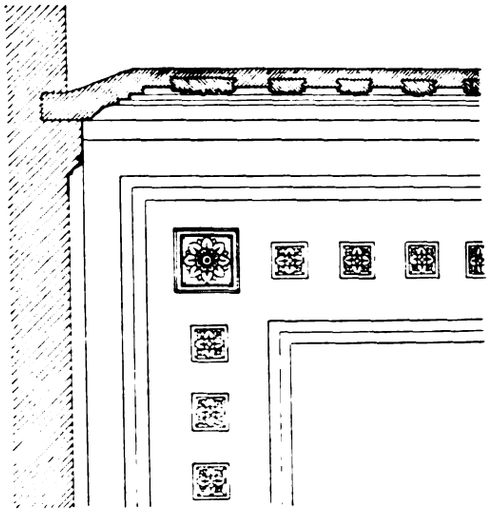


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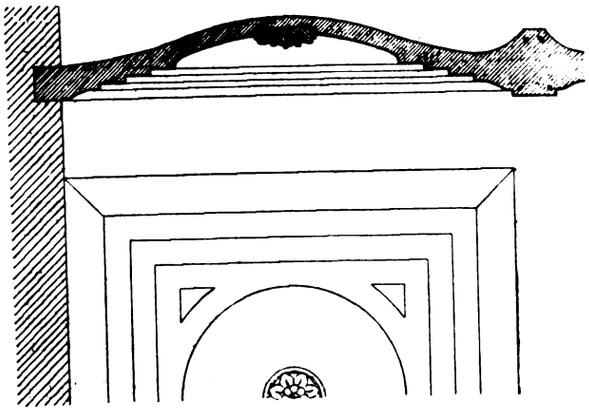


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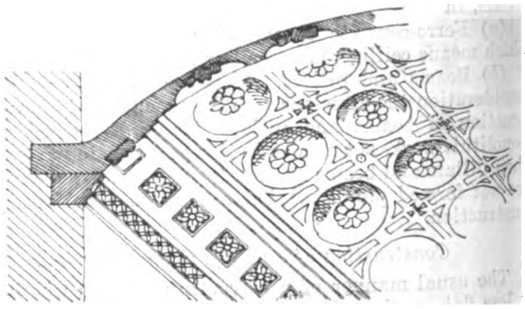


FIG. 7.

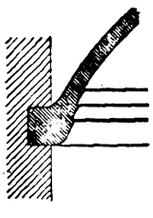


FIG. 8.

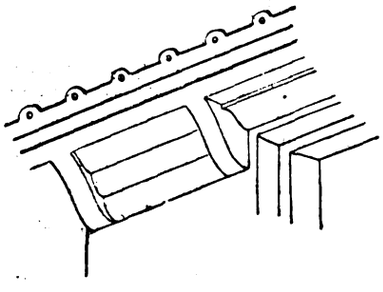


FIG 9

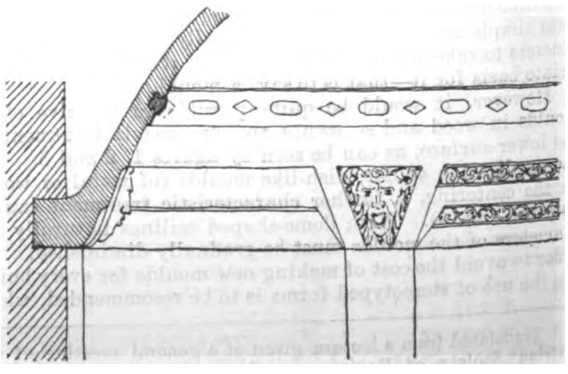


FIG. 10.

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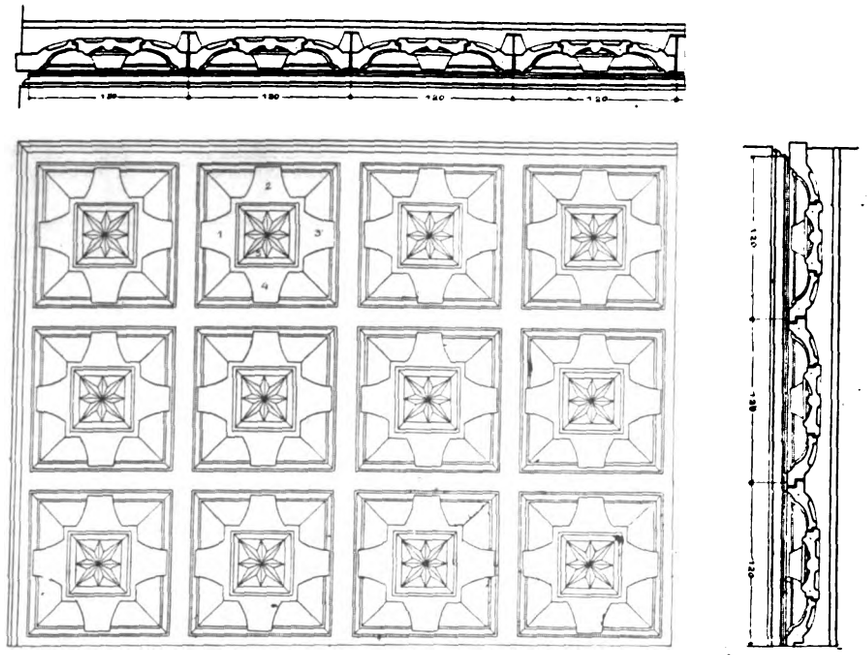


FIG. 11.

parts which formed the cove were made in small pieces on account of the weight.

In setting out the coffers it is necessary to take care that the weight of a single piece is not more than 60 to 80 kg., so that two workmen may be able to carry it without being compelled to use a lifting apparatus. There is no need for any supplementary concreting, which at first was thought to be necessary.

In the Law Courts building at Brünn a ceiling of rectangular coffers (fig. 15) was constructed, and the principle of ceiling between beams has thus been extended to rectangles of 30 to 50 cm. width and 120 to 130 cm. length.

A vaulted form of coffered ceiling or a flat coved ceiling as well as the coffering of a flat ceiling are most characteristic for a construction made of soft material in a hollow mould,

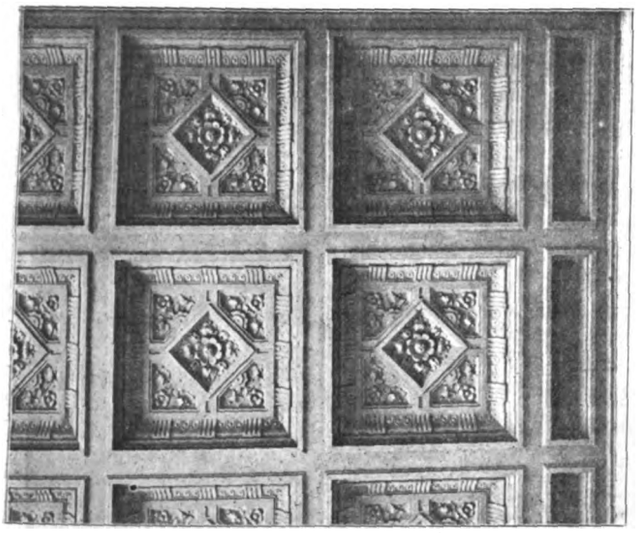


FIG. 12.

so that there is no imitation of ceilings constructed of wrought wood or plaster.

In all these ceilings formed with coffers their connection is effected by means of beam-members, which are so arranged that the joints are covered by projecting parts. The cost of this construction is not greater than that of an ordinary concrete ceiling with ornamental covering of wood or stucco attached to it.

Thus the question of constructing a concrete ceiling which requires nothing else except painting has been solved.

The beams, if such are used as in the case mentioned, may remain visible or can be plastered.

The bearing capacity of concrete allows one to use concrete coffers made beforehand for the construction of vaulted ceilings without using close centering to them.

If such rectangular or square coffers which have been made of one piece, except perhaps a centrepiece or rosette, are joined together by pieces in the shape of dovetails or joggles in the direction of the pressure of the vault, then it is clear that there is no need for other support than the centering required for forming the desired arches. A ceiling (fig. 16) of this kind in segment form has been constructed for an entrance hall of the Law Courts weighing 150 kg. per m². With a span of 4 m. the compression amounted only to 3 mm.

This kind of construction would also be possible for large vaults and domes; the coffers are to be applied in annular zones from the counterfort upwards, and are bound together by the concrete filling, which must also be in annular zones. By the coffers which are connected one with another a support of sufficient bearing capacity is produced, so that the concrete filling can be put upon it straight away (fig. 20).

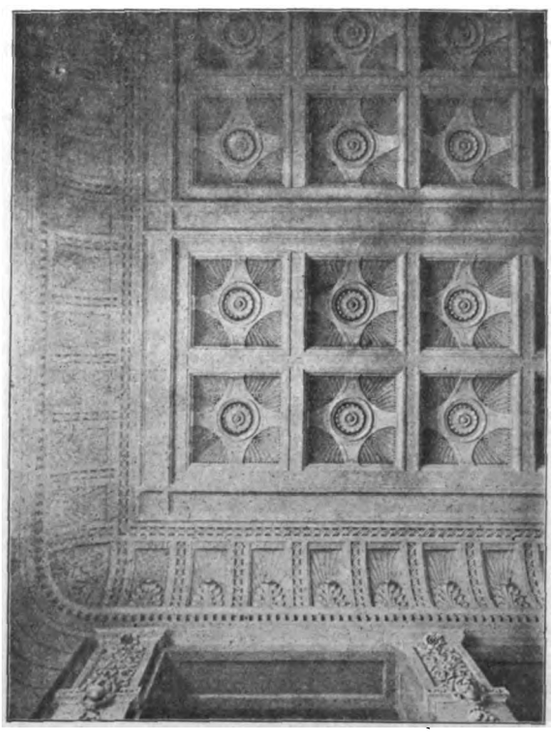


FIG. 13.

With circular or polygonal constructions trapezoid-formed coffers or sections are necessary. The centre rosette is better put in afterwards in order to reduce the weight, which is of importance in handling the pieces when fixing them. The jointing of the coffers one with another and of the centre-piece is effected by dovetails, by pins, or by ferro-concrete dowels.

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A design for a church holding about 4,000 persons in a large town, and where the width of the nave is 20 m., which was made a few years ago adopts the form of a pointed barrel vault which has been ceiled independently of the iron roof construction (fig. 17).

The homogeneity of concrete, and the experience gained by the construction of the above-mentioned entrance hall at



FIG. 14.

Salzburg, allows one to think that it is possible by joining several coved members to execute in concrete such ceilings as those of the Italian churches (Rimini, Verona, &c.), which have been made in wood (fig. 19).

Shapes of Beams and Pillars.

The shapes of the beams constructed of ferro-concrete depend mostly upon the necessity of making them on the

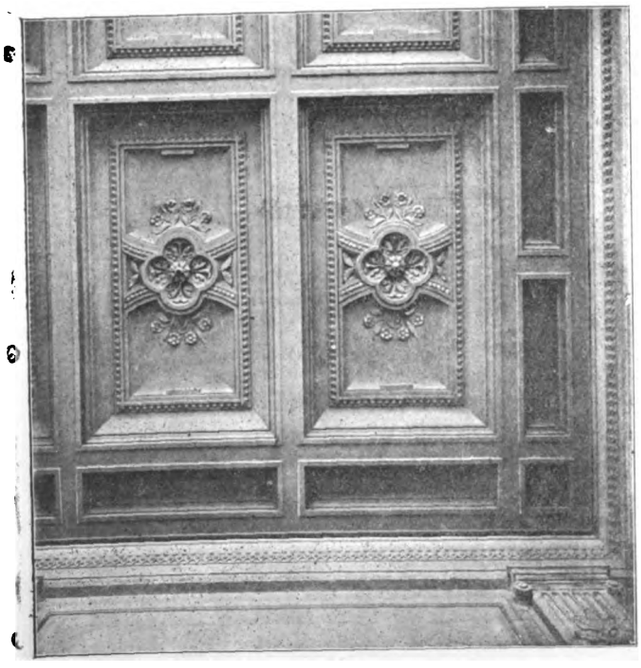


FIG. 15.

building site, because only those of small size should be transported ready made to the site of the building on account of the difficulty of transport and the probability of damage.

The shape of the beams is dependent on the form of the mould; a decorated surface and sides are easily made (fig. 20).

With beams made on the spot the simple forms which

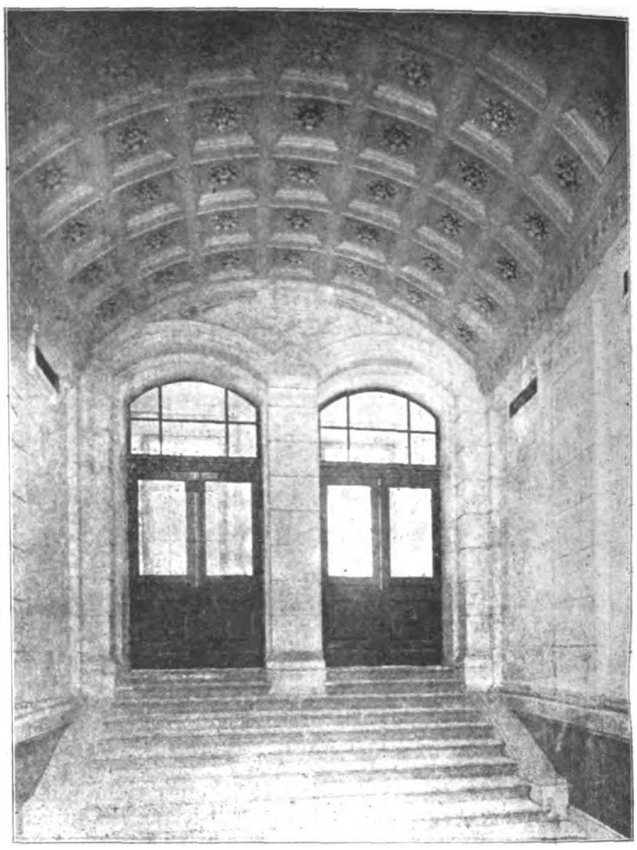


FIG. 16.

are obtained by concreting around ready-made ornamental pieces inlaid on the wooden centering should be taken into consideration.

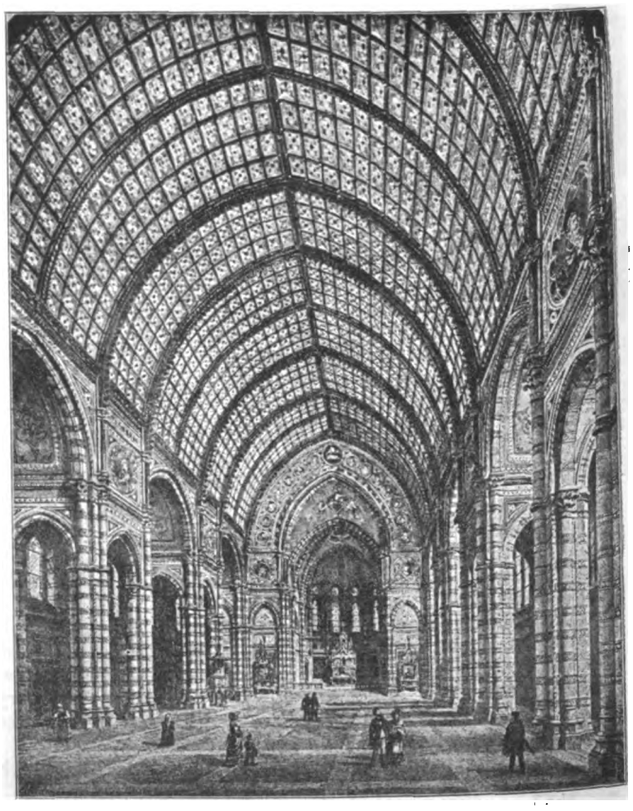


FIG. 17.

In order to reduce the weight hollow beams with or without projecting ribs can be used. As insets in the casting

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moulds only simple forms, sloping or flat grooves, should be considered. Insets of metal may very well be used in order to lessen the need for finishing the concrete by means of lime plastering as much as possible.

For beams requiring decorative architectural treatment on the side, such as lintels over windows and doors, one has to use moulds which are placed to give a lateral view (gypsum, wood, or concrete) on the centering; the tests made with this arrangement have given satisfactory results, for it has been seen that concrete gives the exact forms when the mould has been placed in a lateral position.

Besides the straight form of beams the arch form has also to be considered, and this can be attained by a polygonal approximation to the line of an arch in the centering.

This form is of special importance when we have to deal with the design of the nave of a church or with the building of a hall, as then the lower beams so formed can be utilised as supports of a flat roof, and thus any further roof construction, except purlins from beam to beam, becomes superfluous.

Closely connected with the form of the beams is that of the projections, which can easily be obtained in concrete construction in the shape of corbel or console-like forms.

(To be concluded.)

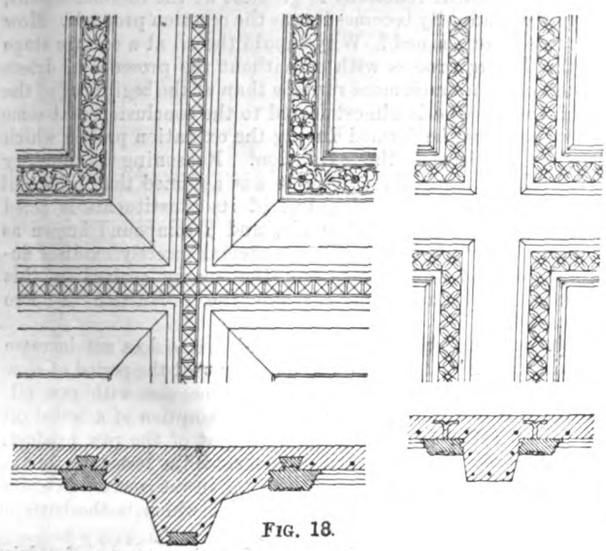


FIG. 18.

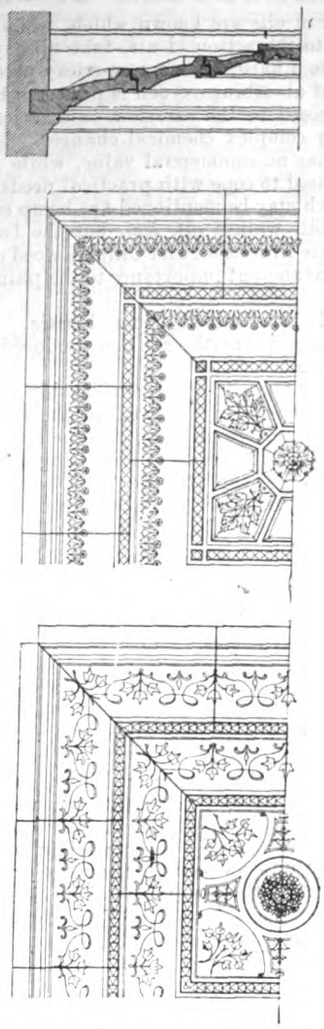


FIG. 19.

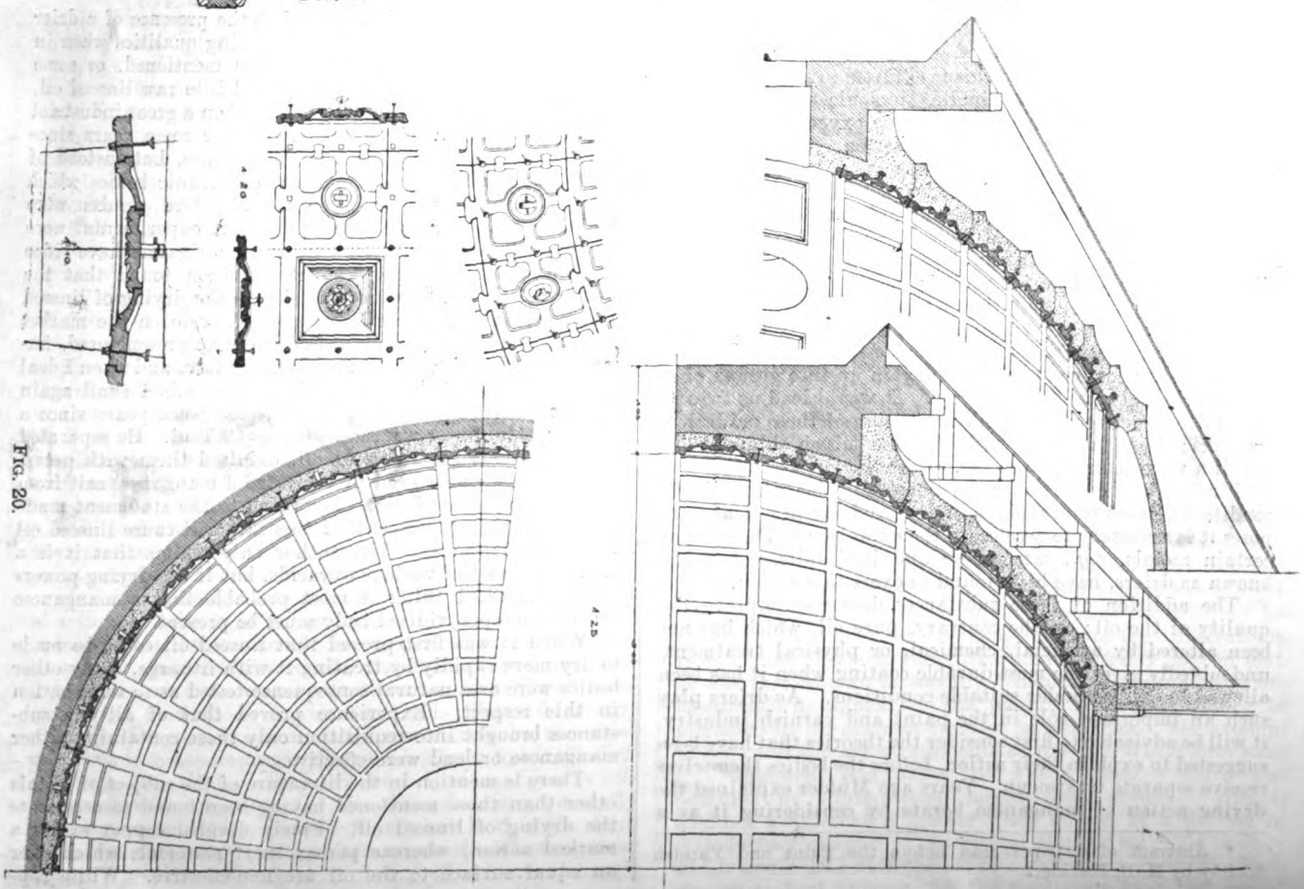


FIG. 20.

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THE USE AND ABUSE OF DRIERS.*

A NUMBER of oils are known which, when exposed in a thin film to the action of air, take up oxygen, and are transformed into a hard, elastic, non-sticky product.

The power of absorbing oxygen is possessed by many fatty oils: when exposed to the air slow oxidisation takes place accompanied by complex chemical changes. In many cases this property has no commercial value, while in other cases it has been utilised to cope with practical needs. Among the drying oils which may be mentioned are hemp seed oil, poppy oil, sunflower oil, walnut oil, &c., but the two drying oils *par excellence* are linseed oil and Chinese wood oil, the former of which is of paramount importance to the paint and varnish industry.

Linseed oil is obtained from Russia, India, South America, and large quantities are now produced in the United States of America.

The quality of the oil varies considerably according to the attention which has been bestowed on the flax plant. The manure used, weather conditions, and the time of harvesting all play an important part on the resulting oil obtained from the seed. Since greater attention has been paid to these details the quality of the oils obtained from India and South America have been considerably improved, although the oil exported from the Russian ports is still considered the best.

Linseed oil undergoes oxidisation when exposed to the action of the air, and this change takes place more rapidly when the oil contains a high percentage of linolenic acid and isolinolenic acid glycerides.

Olive oil absorbs oxygen extremely slowly (5.2 per cent. is taken up in twenty days. Linseed oil absorbs 12 to 20 per cent. in one to seven days according to the conditions), and bodies of the type represented by stearin undergo no change under normal conditions.

The glycerides of myristic, palmitic, and lauric acids, which are always present in linseed oil, are saturated compounds, similar to the glyceride of stearic acid already described, and these, together with the olein (glyceride of oleic acid) take probably no part in the reaction when a film of linseed oil dries. Their presence gives elasticity to the oil film, but under the influence of light, heat, and moisture, *i.e.*, changing atmospheric conditions, even these substances undergo profound change, the oil film becomes hard, then cracks, and finally disappears.

Andés made some experiments with mixtures of linseed oil containing driers and maize oil. With mixtures up to 50 per cent. of maize oil he obtained dry films in twelve hours. No results as to the effects of weathering on these films were published.

The changes which take place when linseed oil undergoes oxidation were first studied by Mulder. He stated that glycerine is first set free, and this is oxidised to formic, acetic, and other acids, while the linolic, linolenic acids, &c., set free are converted into anhydrides by the oxygen, and finally pass over into linoxyn by further oxidisation. This is a white substance insoluble in ether, the basis of all oil films. The fatty acids when liberated from linseed oil do not dry so rapidly as linseed oil itself, so the actual change which takes place is not that denoted by Mulder.

Hazura proved that the insoluble material obtained from oil films contained glycerine, so it is probable that the glycerides take up oxygen, and this action is accompanied by a polymerisation, *i.e.*, certain properties of the bodies under consideration cause the unsaturated molecules under the influence of the oxygen of the air to join up into groups of a more stable and complex character. It would lead us too far to inquire too closely into the composition of these oxidation products; the results that have at present been obtained are not of a very definite character.

Linseed oil, even under the most suitable atmospheric conditions, takes several days to dry, and for practical purposes it is necessary to accelerate the oxidation. The salts of certain metals, *e.g.*, manganese and lead salts, commonly known as driers, have been found to exert this action.

The addition of these substances does not improve the quality of the oil; on the contrary, pure oil, which has not been altered by artificial, chemical, or physical treatment, undoubtedly gives the most durable coating when it has been allowed to oxidise under suitable conditions. As driers play such an important rôle in the paint and varnish industry, it will be advisable to first consider the theories that have been suggested to explain their action, before the bodies themselves receive separate treatment. Years ago Mulder explained the drying action of manganese borate by considering it as a carrier which absorbed oxygen from the air and gave it up to the linseed oil. On the other hand, he considered that red lead partly acted in this manner, but at the same time it parted with a portion of its combined oxygen and directly oxidised the oil. By describing driers as catalytic agents, *i.e.*, substances which increase the velocity of a chemical process without themselves undergoing apparent change, Weger was a step in advance of Mulder, because, while the latter considered the salt manganese borate as the active agent, the former realised that the quantity of metal present was the factor to be considered. During the last few years the theory of autoxidation has been put forward: this hypothesis explains processes of oxidation which were formerly little understood.

The oxidation of linseed oil is such a complex process that an explanation which is intelligible to the non-scientific and at the same time fruitful in conclusions deducible from it for the exact comprehension of driers and their sphere of action is somewhat difficult to formulate.

Exact experiments conducted under certain fixed conditions have shown that during the drying process oxygen is first slowly absorbed, and after a certain interval of time the oxidation takes place much more rapidly.

Now this is contrary to general experience. The velocity of most chemical reactions is greatest at the commencement, and then gradually becomes less as the reaction proceeds. How can this be explained? Why should the oil at a certain stage in the drying process with or without the presence of driers absorb oxygen much more rapidly than at the beginning of the oxidation? One is almost forced to the conclusion that some substance must be formed during the oxidation process which further accelerates the oxidation. Reasoning by analogy with other chemical reactions it was assumed that, when oil is exposed in a thin film, one of its constituents is acted upon by the oxygen of the air, and a compound known as a peroxide is produced. This material directly oxidises another portion of the oil, and the energy evolved by this reaction still further accelerates the production of more peroxide.

It appears that the presence of driers does not increase the initial velocity of absorption, but that the period of slow absorption is much slower than is the case with raw oil. Thus it is evident that the oxygen absorption of a boiled oil does not differ in character from that of the raw product, but the presence of the drier accelerates the formation of the peroxide which is the ultimate factor in the conversion of the oil into the insoluble elastic product which is the basis of the oil film.

It has been previously stated that the presence of a drier in linseed oil does not improve its lasting qualities when in the form of a film. If the peroxide mentioned, or some efficient substitute, could be introduced into raw linseed oil, which would give it drying properties, then a great industrial advance would have been made. Weger some years since made experiments somewhat on these lines, but instead of employing peroxides, he made use of organic bodies which are readily affected by oxygen. Negative results were obtained, and for a time no other experiments were attempted in this direction. Other investigators have since employed true peroxides and it has been found that the presence of these bodies does accelerate the drying of linseed oil. Although I do not know any peroxide on the market which will efficiently replace the driers at present used, improvements in this direction are taking place, and when I deal with the effect of light upon the drying oils I shall again have occasion to mention this subject. Some years since a very powerful dryer was suggested by C. Toul. He separated the fatty acids from linseed oil, oxidised them with potassium permanganate, and precipitated a manganese salt from the material so obtained. According to the statement made by this author 25 per cent. of this salt will cause linseed oil to dry in 7½ hours. The author only claims that it is a manganese salt of various oxyacids, but if the drying powers are as stated, I think it most probable that a manganese salt of some peroxidised body must be present.

When it was first proved that linseed oil could be made to dry more rapidly by treating it with litharge, many other bodies were as a natural consequence tested as to their action in this respect. Experience proved that of all the substances brought into requisition only those containing either manganese or lead were effective.

There is mention in the literature of the subject of metals other than those mentioned having been found to accelerate the drying of linseed oil. Finely divided copper exerts a marked action, whereas porous inert materials which offer an equal surface to the oil are non-effective. White cop-

* Abstract of a paper read before the Paint and Varnish Society by M. B. Blackler.

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peras and the oxides of calcium and barium, &c., in some cases improve the drying, but their activity is very much less pronounced than that of the aforementioned metals manganese and lead, and it is probable that the improved drying observable is due to a physical hardening effect rather than to an acceleration of the oxidation.

The various compounds of manganese and lead offered a wide scope for investigation. Acetates, borates, carbonates, citrates, nitrates, sulphates, oxides, hydroxides, oxalates, &c., of these metals were introduced to manufacturers, and with the pronounced liberal spirit so evident in the paint and varnish industry each manufacturer selected a more or less complex combination of these materials, called it his drier, hugged it as a great secret, and was perfectly contented with his superior position in relationship to his contemporaries. It is now known that the metals are the effective agents and that the inorganic or organic acids with which they are combined are only of importance in relationship to the ease or difficulty with which the metals can be taken up by the oil. Expensive salts of manganese and lead offer no advantages, and the practical driers resolve themselves into the following:—

Commercial Driers (Lippert).

Drier.	Theoretical Percentage of Metal.	Average Percentage of Metal.	Minimum Temperature at which drying oils are produced.
1. Manganese hydroxide	62·5	45–50	170°–200°, but 200°–220° is more certain.
2. Manganese peroxide	52·4	45–50	
3. Litharge	92·8	about 93	Are all taken up by cold oil under suitable conditions.
4. Manganese borate	—	5–15(–22	
5. Manganese acetate	22·5	about 22	
6. Lead acetate	54·6	about 54	
7. Manganese resinate (ppt)	7·7	about 7 sol.	Soluble in cold oil.
8. Manganese resinate (fused)	5·3	2·5–4·5 fused	
9. Manganese linoleate	8·9	about 9 sol.	
10. Lead manganese resinate (melted)	—	—	
11. Lead manganese linoleate	—	—	
12. Manganese sulphate	—	—	

One and two are comparatively insoluble compounds which require heat for their solution, while 3 to 7 are taken up by cold oil when effectively mixed with it. This method would not be suggested for the preparation of drying oil. Manganese and lead acetates melt when heated in their water of crystallisation and are more satisfactory if used in the anhydrous condition.

The remaining compounds, 8 to 12, are the so-called soluble driers; since their introduction in 1885 they have found wide application in the paint and varnish industry.

Experience has proved that a drier, e.g., hydrated manganic oxide, is not always equally soluble in linseed oil although the analytical results may be quite satisfactory. The physical condition of the particles materially affects the value of the product. For this reason practical tests are even more necessary than chemical tests when an opinion is to be given on a drier. It has been shown that manganese borate is completely soluble in twice its own weight of glycerine, and this mixture has been patented as an effective drying agent.

The soluble driers vary more in character than the inorganic products. We know that linseed oils vary greatly in constitution among themselves, consequently the salts prepared from them, particularly when obtained by a process of fusion, are even more variable in character and cannot be judged according to a fixed constitution. This argument applies even more strongly to the resinates, which also vary considerably according to the resin which has been employed in their production.

Both the resinates and linoleates should be free from uncombined inorganic oxides which are insoluble in oil at the comparatively low temperature at which the soluble driers are employed.

Although resinates have found extensive application in the paint industry, I do not consider them suitable driers for paint which is intended for outside use.

As driers, lead and manganese each have their own sphere of action. It should be a postulate of the paint and varnish industry that the smaller the proportion of driers contained in a dried paint or varnish film the more durable the coating. Even if molecular proportions are considered manganese is a more effective drier than lead. When durability alone is the consideration manganese should be the drier used, but in many cases other conditions have to be satisfied. Although the dried coatings obtained from manganese oils are practically colourless, the oils themselves are, generally speaking, more highly coloured than when lead is the drier used. For this reason white paints prepared with manganese oils give one the impression of being off colour, although this disadvantage does not appear after application.

(To be concluded.)

NOTES ON BOOKS.

"A Practical Treatise on Bridge Construction." By T. Claxton Fidler, M.Inst.C.E. Fourth Edition. (London: Charles Griffin & Co., Ltd.)

THE fourth edition of this standard work has been improved in several directions. The difficult problem of the determination of a safe working stress, less rough and ready and more accurate than the old-fashioned method of simply dividing the ultimate breaking weight of the material by an empirical factor of safety, is discussed more fully in the light of further observations and experiments made since the previous editions were published. In bridges more than in many other kinds of building the subject is of considerable importance, as it is an essential condition of a bridge that it is subjected to variable loading. Hence Professor Fidler, in dealing with bridge construction, cannot neglect the question of working stress. At the same time he points out rightly that a safe working stress is not alone sufficient to ensure the stability of a structure. A further difficult and interesting question is that of the effects of wind pressure, and here the experiments of Professor T. E. Stanton have been utilised as the basis for further deductions; but this subject still remains open for many more investigations. It seems to us that the experiments made up to the present have been too much restricted to very small surfaces and to direct currents. We are inclined to believe that in wind action there is a great deal of variation in effect due to what we may call cumulative intensity, and that the degree of this intensity is largely dependent upon the area of obstruction to the wind current and to the angle between the current and the plane of obstruction. In yacht racing it is well known that a very slight alteration of the plane of the sails has a considerable effect on the dynamic action of the wind. Moving air is a fluid, and when obstructed endeavours to flow past the obstruction, its effect upon which must vary with the precise direction and rapidity of flow. The chapter on the theoretical strength of columns is now more valuable even than before, the table giving the calculated breaking weight of columns being given in a more extended form. The high position that Professor Fidler's work has obtained as a standard will be more than ever firmly maintained by the new edition.

"A Restoration of the Mausoleum at Halicarnassus." By J. J. Stevenson, F.S.A. (London: B. T. Batsford. 2*s*. 6*d*. net.)

Few of the monuments of antiquity have excited more speculation as to their original form than the Mausoleum at Halicarnassus, partly from the fame of this monument throughout the ancient world, partly from the incompleteness of the data on which any restoration must be founded. Sir Christopher Wren, Hawkesmoor, Cockerell, Watkiss Lloyd, and Edward Falkner were all working very much in the dark, their conjectures being based on the descriptions only of Pliny, Hyginus, and Martial, with the story of its destruction by De la Tourette and the Knights of Rhodes. It was only after Sir Charles Newton had discovered and brought to England what remains of the Mausoleum and may now be seen in the British Museum that any satisfactory basis existed for reconstructing the design of the monument. Even now there is room for conjecture, and hence the interest of the late Mr. Stevenson's attempt, which we will not follow here but which certainly is very well argued and has, to our mind, the appearance of probability rather than plausibility.

"Art in Great Britain and Ireland." By Sir Walter Armstrong. (London: William Heinemann.)

Two or three years ago Messrs. Heinemann published a guide hand-book to the art of the world under the slightly misleading title of "Apollo." The author, Dr. Soloman Reinach, had a choice of many methods of treating the subject before him, and he chose the pictorial one whereby his letterpress was more or less subservient to the illustrations, two or three of which were introduced into every page of text. It was therefore an essentially "popular" manual, and one calculated to appeal to the public, who would never be attracted by an abstract treatise on æsthetics. The attempt to compress the art attainments of the Old World into some three hundred odd pages, of which space a third was occupied by illustrations, might seem absurd. But it assumes a different character when offered as a preface or introductory chapter to a series of similar manuals each of which would deal with the art of a particular country. Such was its evident purpose, for the publishers have just issued a precisely similarly arranged handbook on "The Art of

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Great Britain and Ireland," which states that they purpose to bring out a series of fifteen more, each dealing with the art of one country and people, and written by an acknowledged authority of that particular country. The catholicity of the scheme is ensured by its simultaneous publication in French, German, Italian, and Spanish, as also in the United States. It must have required some boldness to have inaugurated this excellent scheme by the volume dealing with the United Kingdom. This country does not by any means enjoy the reputation of having served as the cradle, and still less as the home, of the arts during present or past centuries. But any impression that we are a nation of barbarians should be severely shaken by this latest book, which gives a bird's-eye view of our artistic achievements. There have been, of course, dark periods when the iconoclast, the vandal, and the scoffers reigned supreme and unchallenged—that is to say, as Sir W. Armstrong expresses it, there have been untimely catastrophes, each of which came at a critical period, "and took a course which ensured the largest possible amount of destruction and dislocation." But these miscreants were only productive of painful interludes, and failed to eradicate the tree of art, whose roots stretched back to the early centuries of the Christian era and whose fibres were tightly twined round the national life. The heart of the tree was architecture, and that art furnished the life-giving sap to the trunk and branches. This fact is fully recognised by the author, who in his preface, and in the first half of the book, practically devotes himself to the consideration of its development. This is all the more gratifying from the fact that Sir Walter Armstrong, as Director of the National Gallery of Ireland, might have been expected to somewhat minimise the pre-eminence of architecture. Fortunately he was saved from any such obliquity of vision by the possession of considerable knowledge of that art. Indeed, his opinions, although offered in such a modest phrase as "The connection between Early Norman architecture and that of the Saxons was probably less slight than is usually supposed," are worthy of consideration. The chapters are written in the form of essays dealing with the particular period or form of art under discussion, and are full of interest and suggestion, being very different from the more painstaking compilation that might have been excused as coming from an authority on one special branch. The chapters on painting show the various periods and productions practically from the advent of Holbein to our own day. The illustrations, combined with those on sculpture and "Certain Minor Arts," and, above all, the architectural photographs and drawings, show what a goodly heritage falls to the lot of every one born in these isles. The future offers hope of being worthy of its great past. Sir W. Armstrong proudly asks, "Has any people ever drawn itself more rapidly out of a non-artistic morass than the younger English and Scottish architects out of the chaos of nonsense building which prevailed here twenty—or even ten—years ago?" The volume is no doubt intended for perusal by non-architects, and it is well that they should read this encouraging message early in the book, and so feel a greater confidence and pride in contemporary architecture than seems to be general.

COMPETITIONS.

THE competition for the extension of Grimsby town hall has elicited fifty-one designs, which are now on view, but are scarcely worth a long journey to see. The assessor, Sir Alfred Gelder, has awarded the first place to Messrs. Eade, Johns & Browne, of Ipswich, the second to Messrs. Withers & Meredith, of London, and the third to Messrs. Rigby, Oliver & Phipps, of Manchester; but the Town Council has not approved the award as regards the payment of the third premium, on the ground that the authors' estimate too far exceeds the sum stipulated in the instructions. The third design would certainly not cost more than some others which, in the reports of their authors, are estimated at 26,000*l.* and a trifle over.

Messrs. Appleyard & Quiggin, architects, Liverpool, have been placed first in a competition organised by the Urban District Council of Waterloo-with-Seaforth, near Liverpool, for proposed Council schools in Crosby Road North, Waterloo, and Rawson Road, Seaforth. The assessors were Mr. P. S. Worthington, M.A., F.R.I.B.A., of Manchester, and Mr. Herbert T. Buckland, Birmingham.

THE competition for new secondary school at Whitby has been decided, and in accordance with the recommendation of the assessor, Mr. Paul Waterhouse, the first place has been awarded and the appointment as architects given to Messrs. Thomson & Bristow, of London. The second place, with premium of twenty guineas, has been obtained by Mr. R. W. Owen, of Liverpool; and the third place, with premium of ten guineas, by Messrs. Oliver, Leeson & Wood, of Newcastle-upon-Tyne. A very large number of drawings were submitted in the competition.

OUR CONTEMPORARIES FROM OVER-SEAS

THE *American Architect* has a Gothic number, the principal illustrations being of the reconstruction of the church of St. Vincent Ferrer, on Lexington Avenue, New York, a Catholic church for which Messrs. Allen & Collens and Mr. James W. O'Connor are associated as architects. The design is described as "following as closely as possible the best examples of the French Gothic," but reminds us of the Votiv-Kirche at Vienna more than anything we have seen in France. Mr. Collens writes an article on "The Grotesque in Gothic Ornament," illustrated chiefly by examples from the Union Theological Seminary, New York. The view of old Italian architecture is this week a detail of Lucca Cathedral, to keep up the Gothic *cachet*.

Deutsche Bauzeitung illustrates a country house at Barmen by Messrs. Albert Schulte & Volmer, and gives us an account of a fine example of town planning from the "Architectural History of Carlsruhe, 1715-1870," quite a subject for Professor Adshead, in his new school of Civic Design. Still on the same topic is an account of various schemes for the improvement of the lay-out of Paris. An interesting article, illustrated, is a description of a trip from the Dolomites to Venice, by Professor W. Manchot.

La Construction Moderne reproduces some of the remarkable and careful drawings made by M. Adolphe Thiers of the interesting church of SS. Sergius and Bacchus at Constantinople, the plan of which, with its axial variation of the dome and enclosing square, is very striking and curious. Our contemporary's remaining illustrations are of a villa at Mar-del-Plata, near Buenos Ayres, which we hope no one will copy over here. The series of articles on perspective drawing with a home-made trammel is concluded.

Het Huis continues its account of the Wallachian almshouse at Amsterdam, with further illustrations. Deventer and its history are described in an article which is to be continued, and illustrations are given from old engravings and photographs of its seventeenth-century aspect.

Correspondence

[*The Editor will not be responsible for the opinions expressed by Correspondents.*]

The People's Budget.

SIR,—Mr. Kemp in his letter to you of last Friday has touched the point which is generally missed: interfere with the landowner, and you interfere with trade. This is emphatically the case in the building trade, and if you touch the pocket of the employer, you still further touch the pocket of the employé. A member of Parliament, who is but a cog in the political wheel, may not comprehend this, but the British working man will if you point it out.—Yours, &c.,

P. B.

GENERAL.

Mr. Henry Brett, of Auckland, New Zealand, who is now in London as one of the Imperial Press delegates, has decided to present to the Corporation of Auckland a new organ for the town hall at a cost exceeding 6,000*l.* This enormous instrument is to be built at the works of Norman & Beard, Ltd., and is to be shipped to New Zealand at the latter part of next year.

Mr. G. Fellowes Prynne, F.R.I.B.A., has presented a report on the condition of the old church of St. Mary, Plympton. He states:—"There are several cracks in the tower which time will naturally widen; part of the parapet of the tower bulges out, one of the pinnacles is considerably out of perpendicular, and the top of another needs attention. The gutters and lead work of the roof require repair to prevent leakage in wet weather. There is also much necessary work required to be done to the interior." The approximate estimate of cost is:—Tower, 450*l.*; exterior of church walls and roof, 50*l.*; lightning conductor, 25*l.* It has been unanimously agreed that a committee will take steps to carry out the work proposed by Mr. Prynne.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, September 25.

Institution of County and Municipal Engineers: Eastern District Meeting at Lincoln.

Monday, September 27.

Architectural Association: School of Architecture, Winter Term begins.

Iron and Steel Institute: Autumn Meeting in London September 27 to October 1.

Monday, October 4.

Royal Academy: Course of six Lectures on "Chemistry" by Professor A. H. Church, D.Sc., M.A., F.R.S., opens. Subject: "Paper, Canvas, Panel, and other grounds."

Society of Engineers: Meeting in Room 18 Caxton Hall, Westminster. Paper on "The Status of the Engineering Profession," by Mr. G. Allan Thomas.

Wednesday, October 6.

Institution of Sanitary Engineers: Meeting at Caxton Hall. Paper on "The Present Position of the Sewage Disposal Question" by Mr. W. J. Dibdin, F.I.C.

EXHIBITION OF STUDENTS' WORK, L.C.C. CENTRAL SCHOOL OF ARTS AND CRAFTS.

WITHOUT knowing the class and capabilities of the students it is difficult to appraise the value of the instruction given in any school. The results attained depend not only on the ability of the masters to teach, but on the aptitude of the pupils to learn and of their previous knowledge when they commence a course of instruction. In any exhibition of students' work one naturally expects to see the best that the school can produce, particularly when the amount of work shown is strictly limited in extent, as is the case in the present instance.

The most striking point about the exhibition of students' work at the London County Council Central School of Arts and Crafts is the inequality of the level of achievement that is reached in different subjects. While in some departments excellent work is shown, in others the standard is remarkably low, when one considers that all students at the Central School are presumably intending to earn their living at the particular art or craft which they are there learning. On the other hand, we must remember that the L.C.C. Central School has not very long been housed in its present home, and it is possible that with the change of location there has been a lack of continuity in the individual students whose work is now exhibited.

Directing our attention first to the School of Architecture and the Building Crafts, which, by the way, is held only in the evening, as appears from the prospectus of the School, we find a very low standard of excellence. We take it that we may understand the work of Mr. S. HOWARD JONES to be representative of the high-water mark of the School of Architecture and his design for a seaside house as the most important work exhibited. The aspects of the various fronts of the house are W.N.W., N.N.E., E.S.E., and S.S.W. The designer, to our mind, has gone hopelessly astray in respect of the vitally important question of aspect, for even though a seaside house may presumably be chiefly used in the summer time, we scarcely have any English summer in which the sun is altogether to be avoided; and as the sea-view is W.N.W. of the house, it must be supposed that the house is to be built in a "bracing" locality. Mr. JONES lights the drawing-room from the W.N.W. and N.N.E., the dining-room from W.N.W., about the worst possible aspect, for by help of a bay window a considerable amount of due West light is obtained, so that what sunshine the room does receive is from the low and glaring Western rays, which are so unpleasant at dinner-time. The day nursery has its light from E.S.E. and S.S.W., the night nursery S.S.W., also the worst possible for children who go to bed early. All the other bedrooms face either W.N.W. or N.N.E.

The next point in which we think the designer has erred is the sizes of his rooms. The drawing-room is 18 feet by 30 feet; billiard-room, 26 feet by 20 feet; study, 15 feet by 14 feet; and those who live in these rooms have to take their meals in a dining-room 16 feet by 18 feet, with a fireplace of full projection still further reducing the width of 16 feet. That the house is not a small one will be understood from the sizes of the "reception" rooms, and is still further illustrated by the provision of a servants' hall 18 feet by 13 feet. The site was not a particularly easy one to deal with, as not only was the sea-view in an awkward aspect, but there is a considerable rise from South to North, so that the principal entrance is on the first floor.

The elevations are treated in a seventeenth-century mullioned window type of architecture, in which it is not easy to go wrong, but Mr. JONES has managed to include an anachronism in a "Wilton" window, though he has had the good sense to modify its incongruity to some extent by diverting it of its usual trimmings.

A design for a gardener's cottage by Mr. G. A. BRYAN, though a less ambitious subject, is a better performance. The demand for a kitchen, sitting-room, large scullery with bath, and a potting shed on the ground floor, render easy the provision of four good bedrooms above and a liveable house and picturesque withal is the result.

Two designs for the elevation of a terrace of nine houses are not very remarkable for excellence, although Mr. F. G. MITCHELL'S, in what we may call the L.C.C. style, is not altogether devoid of merit.

The measured drawings and water-colour sketches are of a very low quality, and their authors have a long way to go before they reach the standard, say, of honourable mention in the competition for the Pugin Studentship.

Very good is the system adopted in the School for teaching the nature of stresses and strains and their methods of calculation. Working models with spring balances not only make quite clear the direction of the stresses, but enable the students to check by ocular demonstration the results at which they arrive by calculation.

The School of Cabinet Work and Furniture is an evening department, and the work exhibited includes both design and craftsmanship. The designs for furniture are wanting in originality and chiefly feeble copies more or less closely following old examples principally of eighteenth-century work. The executed work is apparently that of young men who are, or should be, apprentices, and far below the standard of a journeyman cabinet maker in joinery, though good in inlay and veneering. This is rather putting the cart before the horse; excellence of surface decoration will not compensate for doors that do not fit and drawers that do not run in high-class cabinet work. Some of the articles of furniture produced, such as the veneered and inlaid cabinet by Mr. H. W. BRANDT,

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would be admirable if the joinery work were characterised by more precision.

It is not quite clear from the exhibition how much work comes from the evening School of Silversmiths' Work and Allied Crafts, but the prospectus includes quite a large range of subjects, under which may be classed some of the best work to be seen. Some copper-plate engravings after ALBERT DURER are excellent; the jewellery, much of which is the work of women students, enamelling and silversmithing are of a very high order both in design and in workmanship, and quite good enough to be marketable, which of course is the goal at which we may suppose the Central School of Arts and Crafts to aim.

Another department which shows work that reaches a high standard is the School of Book Production, which includes bookbinding, typography, black-and-white illustration, lithography, miniature painting and etching, in all of which sections there is to be seen some very high-class work. The exhibition does not make it clear how much of the credit for this is to be given to the evening school and how much to the day classes for black-and-white and other illustration, lithography, miniature painting and etching. Indeed, the exhibition as a whole is very much lacking in arrangement and method. It is not clear to what section of the Central School the various exhibits belong. The work of the Royal Female School of Art is merged, we might say submerged, in the general work of the institution, and possibly the L.C.C. school gets some of the credit that ought properly to belong to the absorbed organisation under the care of Miss ROSE E. WELBY. Certainly very much of the best work in the exhibition has been produced by women students. This is particularly manifest not only in jewellery work but in painted pottery and the especially feminine craft of needlework. We cannot but credit Miss WELBY's pupils with much of this excellence, for the design is good as well as the execution.

Stained glass is the chief product, if the exhibition is to be taken as a criterion, of the School of Stained-glass Work, Mosaic and Decorative Painting. Here the cartoons in monochrome are the best feature, though in some instances sufficient thought seems not to have been given to the leading. The executed examples we think are poor in colour, though the drawing is fair and the leading good. We imagine it must be rather difficult to teach stained-glass work in an evening school. It is hard enough for an expert glass painter to work by artificial light, but for novices to estimate the effect of daylight on translucent glass from its appearance under any form of artificial light must be almost hopeless.

The examples of figure modelling, we presume from life, are good, though the pose in some cases is rather theatrical.

Woodcarving is, to our mind, one of the weak developments of the Central School. The students do not seem to have learnt the first lesson of a woodcarver—to keep his tools sharp. They should be impressed with the desirability, for tyros in the craft, of spending more time in sharpening their tools than in cutting wood. The next lesson that the students of the Central School need to learn is that woodcarving is drawing in the solid with a cutting instrument, but requiring at least as much accuracy of line as if it were done with a pencil on paper, than which it is naturally far more difficult. Anyone can cut wood, but cutting wood is not carving. The students in the woodcarving classes should be obliged to spend a considerable portion of their time in drawing on paper and on the flat wood, and not until their drawing is fairly accurate should they be allowed to handle a chisel and mallet.

NOTES AND COMMENTS.

THE excellent work that is being done by the Committee for the Survey of the Memorials of Greater London is well attested by the publication of Vol. II. of the Survey of London, the eleventh publication of the committee. This deals with part of the parish of Chelsea, a parish that at present at any rate is so rich in memorials of Old London that one volume is not sufficient to record all that it contains worthy of the attention of the committee.

IT is well for London that there are a number of enthusiastic architects and lovers of the ancient art of London to constitute a goodly and efficient body of active members who are skilful with camera and pencil, learned and painstaking in the exploration of antiquarian lore, to gather together records of what still remains to us of the London of the past. Needless to say the memorials still existing cannot be expected to last for an indefinite period. The requirements of our modern life, the value of the land on which they stand, the effects of time and the danger of fire are all elements threatening their destruction. It is important therefore that all who love London should lend assistance to the work of the committee, financially as annual subscribers of one guinea or personally as active members, willing to give their time and their ability if such they can devote to the work with sufficient enthusiasm and quality to rank alongside the accomplishments of the present members.

A VERY good investment is the purchase at twenty-five shillings for those who are not at present subscribers of the latest publication of the committee. Cheyne Walk and Paradise Row from which the subjects in the present volume are mainly drawn are a mine of wealth to the student and the admirer of eighteenth century domestic work, and the photographs and measured drawings as well as the water-colour sketches contributed by the active members are so excellent in character and technique that artist and antiquarian alike cannot but derive both pleasure and profit from their possession and study. The records of the memorials as they stand are well supplemented by historical notes and reproductions of old illustrations.

BY the generosity of the Worshipful Company of Carpenters a course of ten public lectures on the Renaissance of Architecture in Italy is to be delivered at University College, London, by Mr. HALSEY RICARDO, on Tuesday evenings, commencing October 19. Tickets of admission will be issued without fee, but the lectures are intended for those who have already some knowledge of architecture. University College has long been noted for the excellence of the architectural lectures given by the able professors who have occupied its chairs, but the fees have been somewhat high, not in comparison with the value of the instruction given but for the pockets of those for whom they were intended. We do not doubt that Mr. RICARDO will worthily maintain the prestige of the College, and the absolutely gratuitous nature of the offer thus made by the Worshipful Company of Carpenters to the architectural students of London should ensure a grateful and appreciative response.

UNIVERSITY COLLEGE also offers in its evening classes instruction in design under Mr. CYRIL POWER, with Mr. LEONARD STOKES and Mr. ERNEST NEWTON, two of our ablest designers, as special visitors, who will set the subjects and criticise the designs. The fee for this excellent instruction is the merely nominal one of half a guinea for two terms. For those who are novices in design there is a junior design class, embracing also a course of lectures on construction and planning, for which the same nominal fee only is charged. Thanks to the Carpenters' Company, University College is now able to meet the rate-supported Polytechnics on their own ground of low fees, but unless we are very much mistaken it will never descend to the level of Polytechnic teaching in architecture, but always maintain the high tradition of its past. We would advise all architectural students who may be tempted by the low charges of the Polytechnics to turn their steps to Gower Street.

THE report of the Committee on Ancient Earthworks and Fortified Enclosures points out that the Government has taken up, through the medium of Royal Commissions, part of the work that the committee initiated, the recording of ancient earthworks and pre-Roman remains. It is to the credit of the committee that its labours have brought about so much recognition of the importance of

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the subject as to justify it in engaging the attention of a Royal Commission. It is to be expected that the Government will not stop at records, but take such further steps as may be necessary for the preservation of the remains that are still in existence. The committee's report tells us of what in the past year has been effected, largely, no doubt, through their influence and persuasion in the way of preservation, and also what unfortunately has occurred in the way of destruction.

IN the former category we find Maiden Castle, Dorset; Thetford Castle, Meadow and Hill, Norfolk; Stokeleigh Camp, Somerset; White Barrow, near Tilshead, Wilts; Selsea, Sussex; Epping Forest landmarks; Pendinas Camp, Cardiganshire. On the other side of the ledger we have evidence that damage has been done which Government influence, properly directed, might have prevented. The Commissioners of Woods and Forests have leased for quarrying a hill fortress at Penmaenmawr, and the Territorials have practised entrenchment at Conway.

ANOTHER branch of the committee's work is exploration, and in this direction several localities have been investigated, in many instances with the co-operation of local Archæological Societies. The results of the explorations are described in the report or reference made to the bibliography of the subject, in which such results are more fully recorded.

THE annual report of the Sheffield Society of Architects and Surveyors contains the address of the President, Mr. W. C. FENTON, abstracts of lectures delivered during the past session, and the announcement, for the work of the forthcoming session, of lectures by Professor F. M. SIMPSON, on "Architectural Developments during Victoria's Reign"; by NIGEL BOND, on "The Aims and Work of the National Trust"; by EDWARD HOLMES, "Notes on the Development of Town Planning"; by SYDNEY D. KITSON, on "An Eighteenth-century Architect: Carr, of York"; by C. B. HOWDILL, on "Stained Glass." The Treasurer's statement of accounts for the year shows that the balance in bank at the beginning of the year, 45*l.* 0*s.* 4*d.*, has been slightly reduced to 41*l.* 6*s.* 2*d.*, but there appears to be an amount of 7*l.* 10*s.* 5*d.* due from guarantors to the Society for the Department of Architecture, so that the finances seem to be in a satisfactory condition.

"A BEAUTIFUL WORLD" is the title of the occasional journal of the Society for Checking the Abuses of Public Advertising, and to maintain the beauty of a beautiful world is the object the Society has in view. That it is in a measure attaining its object is shown by the passing of the Bill it promoted into law as the "Advertisements Regulation Act, 1907." This Act gives power to local authorities to frame bye-laws with a view to preventing or reducing the disfigurement, by advertisements, of (1) beautiful landscape, (2) pleasure promenades and public parks.

THE difficulty of framing bye-laws under the Act that would be satisfactory is the reason for the little that the Act has already done in improvement of the conditions of advertisement, but it is pleasant to know that the bye-laws drawn up by the County Councils of Westmorland and Somerset, and by the Corporation of Exeter, have been approved by the Secretary of State, and that the draft of the District Council of Barnes is under consideration. The London County Council in July last invited the several Metropolitan Borough Councils to submit schedules of parks and pleasure promenades within their jurisdiction with a view to protecting them by bye-laws under the Act. So that progress is being made in bringing to bear the powers with which local governing bodies are invested. The education of public opinion is part of the programme of the Society that needs continual pressure, but we doubt not that in course of time we shall be spared much of the insult to our feelings and injury to our health and temper that blatant advertisements in public places now inflicts.

DISCOVERIES AT THE GUILDHALL.

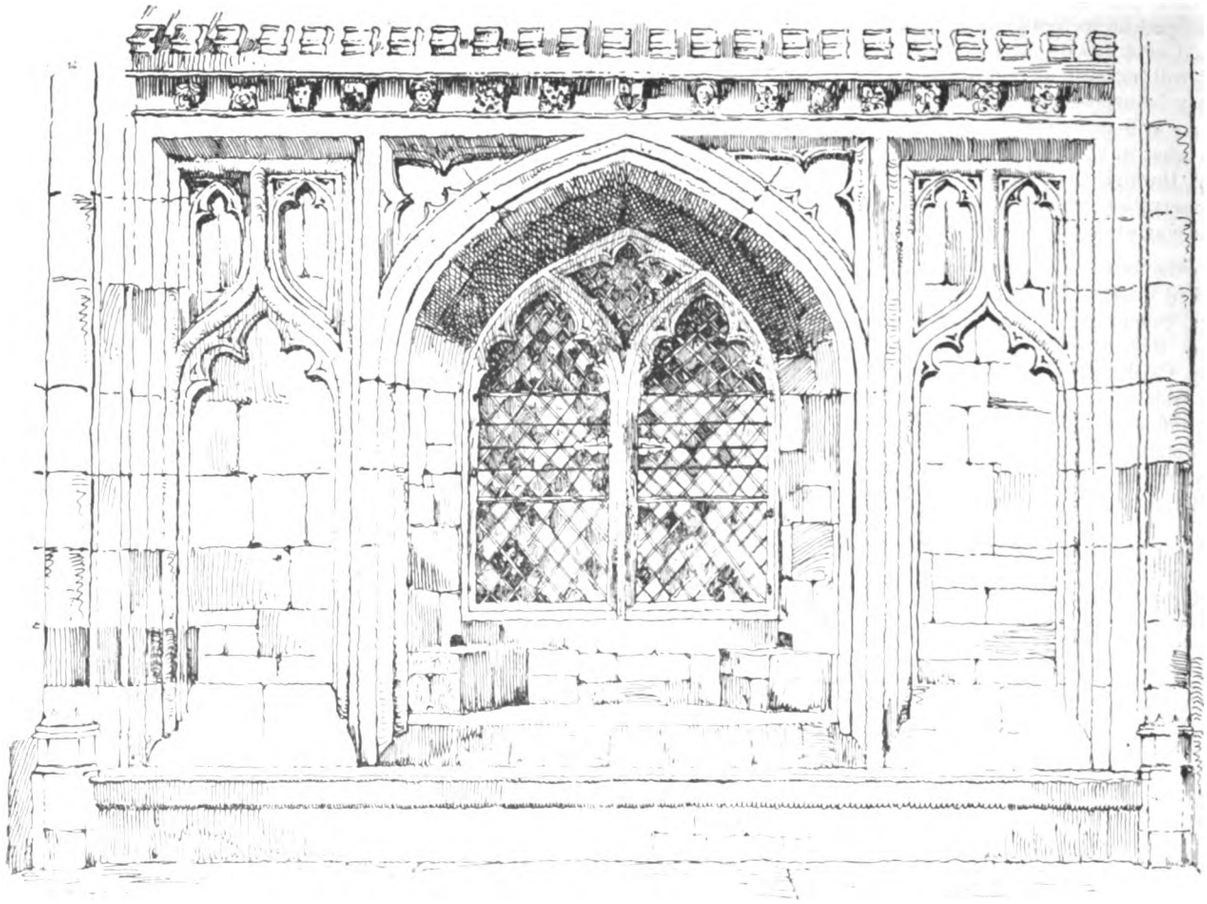
WIDESPREAD interest has been aroused by the discovery of two blocked-up windows in the west end of the Guildhall, near the gallery. Mr. SYDNEY PERKS, F.S.A., F.R.I.B.A., the City Surveyor, has for some time past been carrying out a systematic clean-up, and last week he was authorised to examine a portion of the south wall he diagnosed as containing hid treasure, but which appeared to be mere filling-in. When this was removed a complete two-light Gothic window was revealed, 9 feet 6 inches in height and 6 feet 6 inches in width, the depth from the inside wall to the glass being some 3 feet. Each of the sections has an iron latch and swings on strong hinges. The stonework round it contains iron rests for supporting shutters, and on either side at the bottom are blocks of stone. The inference that other similar windows might also be bricked-in proved correct, for on the following day a second was discovered in the wall immediately opposite. This latter was in a worse state of preservation, for the mullion was broken, and it was without glass. It is generally believed that these windows are part of the Guildhall that was commenced in 1411.

The tradition that the City of London has had its civic life focussed on to the present site of the Guildhall since the reign of EDWARD THE CONFESSOR is not one that will bear investigation. Its chief grounds are that arms of that monarch appear on bosses in the crypt and porch. But these cannot possibly be carving of contemporary date, and at most point to the possible existence of a belief when the later hall was built in the reign of HENRY VI. that a similar building may have occupied the site over three centuries earlier. The unimpeachable records of the Hustings Rolls contain references to meetings at the Guildhall from 1269 onwards. JOHN PRICE, who prepared an elaborate official descriptive account of the building over twenty years ago, says:—

"The entries are sufficient to illustrate the existence of a Guildhall in the thirteenth century, and to show that to all intents and purposes the uses to which the early building were devoted have remained unchanged to the present day; and, further, they go to prove that the site of the hall is in close association with that upon which the first one stood. They prove conclusively that, while the hall has passed through sundry transitions—been altered, added to, and enlarged from time to time, no evidence is forthcoming to show that the Guildhall of ancient times was ever situated in any other part of London than where it at present stands. The enlargement of this ancient building appears to have taken place in the year 1326, and in the mayoralty of Richard de Breton, Britain, or Betoyne. At this time a grant of timber and lead appears to have been made towards the works at the hall and chapel."

But the indisputable history of the building commences from 1411, when, in the words of an alderman elected eighty years later, "Ye Guylde halle of Lodon begon to be newe edyfied, and of an olde and lytell cotage made into a fayre and goodly house as it nowe apperyth." The manner in which the requisite funds were obtained was not of a kind that would be now tolerated. From 1412 till 1439 the Court of Common Council exacted extra fees of 2*s.* 6*d.* and 3*s.* 4*d.* from all apprentices at the beginning and end of their apprenticeship; for every will an extra fee of at least 6*s.* 8*d.* The fines imposed in the Mayor's Court were devoted to the work, and also fees from deeds, charters, letters patent, and so on. HENRY V. granted to the City a free passage for four boats by water and four carts by land, carrying building materials. Contributions were continually made by leading citizens like RICHARD WHITTINGTON, whose executors gave 35*l.* to the paving of the great hall with Purbeck stone and glazed some windows. Seventy years later WILLIAM HARIOT, Draper and Mayor, gave 40*l.* for the provision of two handsome louvres in the roof. These show prominently in the old views of London. The chronicle of the Grey Friars quaintly records, "Thys yere in September the King went to Callys with a grete armé agaynst France, but the pece was made with-owte battelle.

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NEWLY DISCOVERED WINDOW AT THE GUILDHALL, LONDON. FROM A SKETCH BY ADRIAN HARDMAN.

And the Qwenys moder dicessyd. And the lovers sett up on the gelde hall of London." The Company of Masons gave a quantity of Kentish rag-stone, and the Linemen likewise contributed in kind.

By the time of the Great Fire of 1666 the various buildings had become of considerable extent. In that conflagration the carcase of the Hall itself, with a portion of its roof, was left, but the various surrounding offices and apartments were destroyed. Curiously this loss is ignored by both PEPYS and EVELYN. However, a contemporary diarist of no mean descriptive powers records:—"That night (Tuesday, September 4) the sight of Guildhall was a fearful spectacle, which stood the whole body of it together in view for several hours together after the Fire had taken it, without flames (I suppose because the timber was of such solid oake), in a bright shining coale, as if it had been a palace of gold or a great building of burnished brass." Although the then Lord Mayor is regarded with undisguised contempt by PEPYS for his inability to rise to the crisis, he lost no time in setting about the re-erection of the Guildhall. An examination was made by WREN, who later designed a supposedly temporary flat-roof, though it endured for two centuries. The rubbish was ordered to be removed, and it was ordered "That Mr. MILLS and the Citty workemen doe speedily as can be done prepare conveniencys within the ruines of the Guildhall, to keepe all the Courts there in the places they were antiently kept." In December of that year THOMAS JORDAN, the city mason, was paid twenty pounds on account for the stonework in connection with the rebuilding. It was also at once decided that a new street, 36 feet broad, to be called King Street, should be cut from the Guildhall to Cheapside, and another from Cheapside to Newgate. The reconstruction of the Guildhall, together with the buildings connected with it, involved a total cost of 34,776*l.* 5*s.* It was carried out on a grand scale and aroused admiration. According to RICHARD BLOOME (1670-93), "The rooms, courts, and offices are appropriated to the same plan wherein they were kept formerly, but much more regular and loftier and more substantially built. The Great Hall being formerly in height, as to the upright of the walls, not above 30 feet, which now are raised 20 feet higher on either side, and at both ends where there are fair windows and eight large windows on either side, of 16 feet high each window, where there were none before."

The history of the Guildhall during the eighteenth century is wrapped in obscurity. In 1785 GEORGE DANCE, R.A., prepared a design for enlarging the porch, and he also designed a startling façade. Shortly afterwards he incurred the displeasure of the Council. The following letter, sent by Mr. DANCE in 1792 to the Court of Common Council, is worthy of reprinting:—

I have executed the office of clerk of the works to the City of London for the space of twenty-five years, and about twenty years since I was induced on account of the increasing state of the City's business to apply to the committee of City lands to be allowed an assistant at my own expense. . . . I have made it a constant rule, either by myself or Mr. Peacock, to survey all new buildings immediately on their being covered in, and before the internal walls were covered, which is the usual mode of surveyors to public bodies as well as individuals who let ground to build on, and for which is allowed a fee of one guinea per house. . . . Whatever errors or neglects may be imputed to me, when I refer to my own conscience I can sincerely say I have never been influenced by corrupt motives, and when the fullest inquiry shall have been made into my conduct I hope and trust it will appear so to you.

The many alterations carried out by Sir HORACE JONES, the City Architect in 1864, show what can be done by one who approaches his work with a deep respect for the past. Particularly noteworthy is the roof of elaborate open timber-work. The same spirit has animated the custodians of the buildings since that time up to the present day. Mr. SYDNEY PERKS, the City Surveyor, has within the past few months been successful in showing much of the old stonework which was previously obscured by paint and plaster. His painstaking investigations have been suitably rewarded by the discovery of the two windows already mentioned, one of which is reproduced in our drawing.

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ARCHITECTURE: ITS TRUE PRINCIPLES.—XIX.

By R. OWEN ALLSOP.

SUBORDINATE MASSES.

THE value of geometrical design in arranging subordinate masses is that by mere rectangularity and parallelism the one part refers (is related harmoniously) to the whole even without the necessity of actually connecting links—that is to say, two building masses near together, either at right angles or parallel, indicate, *prima facie*, connection of the two. Here again we see that the effect arises directly from the plan. Masses not parallel or rectangularly placed have no geometrical connection, real or implied; for the most evident geometrical relation is parallelism or rectangularity. That is to say, the edges of the cube are right-angles and the sides parallel. Anything therefore arranged in the same plane or axis or at a right angle seems to imply direct reference from one mass to the other. The architect, therefore, who is master over the site (arranges a geometrical plan irrespective of ground) is acting on sound principles; and it may be generally laid down as a law for planning that unless practical service demands some other arrangement the square, the axis, and contrasting axis should override the site irregularities. At the same time the following of the natural trend of unavoidable irregularity in the site may bring about of itself varied and interesting compositions. All great works, however, are dominant of the site. Every building requires sufficient ground-space, just as no man can be great who is closely linked, mentally and bodily, to neighbours on either side.

We may, therefore, first consider the arrangement of masses of building on free, unrestricted sites. The first essential of the monumental building is the maintenance of the axial line in the plan. This materialises the geometrical expression of the plan, and ensures symmetry, employing here the term "symmetry" in the sense of that which is well-proportioned and suited to its purpose.

The most reasonable view of the question of pure bi-symmetry—meaning a mathematically equal arrangement about an axis or point—is that there should be this

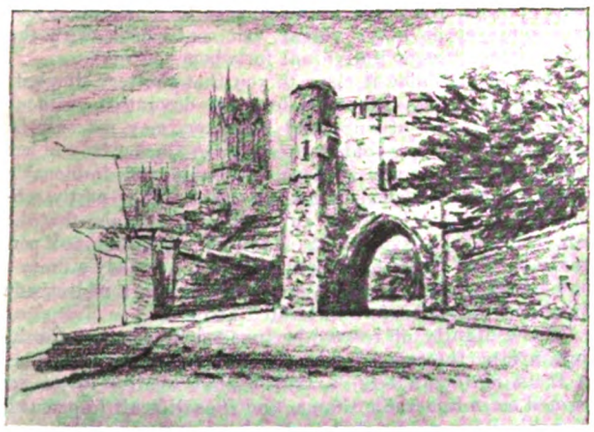


FIG. 41.—THE POTTERGATE, LINCOLN.

symmetry in the detail, but *balance* in larger things. Thus leaves are practically symmetrical, but trees are balanced as to mass. In nature, and pictorial representations of nature, as perhaps observable in fig. 41, tree masses may be frequently noticed to balance an architectural composition. If we extend our inquiry into the animal kingdom we see, generally, one plane of symmetry, usually vertical, with one symmetrical elevation, the front and back as correlative to this. This is the cathedral system—as a rule the symmetrical west end, the asymmetrical side elevation with the great plane of symmetry formed by a vertical section in the long axis through the centre of nave and choir. Who would wish for an exact bi-symmetrical side elevation to Ely or Durham or any of our old cathedrals?

The question here raised is an important one and may well be considered before any attempt is made to find any useful suggestions or rules respecting composition of irregular masses.

The point may be put in the form of an inquiry, as follows:—Why should there be exact symmetry on the western face and not on the side faces of the cathedral? It might very reasonably be advanced that inasmuch as we are pleased with the one aspect—its symmetry—we should be displeased with the other.

We are aware of a sense that it would please us as little to see a horse with a head each end as a cathedral with exactly balancing towers at either end. We may evidently well push on our inquiry respecting geometrical and symmetrical architecture if it can afford us some definite answer to this question.

It is necessary to carefully distinguish between the various classes of symmetry, particularly the distinction between the symmetrical elevation and a symmetrical plane. Apparently, the human figure is symmetrical viewed before, and behind as a natural consequence. The two things have points of separate and distinct import. Thus the plane of symmetry supposes such a bisection of an object, that placing the one half on a mirror, the reflection exactly completes the figure. Thus a swan bisected through the head, neck and back vertically affords a plane of symmetry. It is the symmetry arising from the axial plan. The other kind of symmetry is the plan itself mathematically and equally repeated on either side of the axis. This latter—the plan set up vertically on the cross, heart, anchor, Greek temple, cube or parallelogram—is the symmetry of the cathedral front, supposing the two end towers to be similar.

The general rule evidenced by example seems to be:—Exact symmetry in small parts, but not in large (long) ones. The sense of such an arrangement may be best seen by exaggerating a case, reducing it to an absurdity. Imagine a building with a façade five miles long. What would be the value of exact symmetry—equal halves about a centre—in such an elevation? It is certain that no eye would ever see the symmetry unless it were that of the hovering hawk. Therefore, whilst the effect of symmetry is utterly lost and useless for effect, it should be noted that the whole of the façade *suffers* (the only appropriate term) from the existence of this useless symmetry. Every part of the composition is affected by this reduplication of parts to form a whole equal-sided design. We thus arrive at the main objection to uncalled-for bi-symmetry; that in order to produce it everything else in the composition must be sacrificed, and it should be observed that this cause is altogether independent of the fact that it is inconceivable how the demands of practical service can be met by this mechanical doubling of a design about a central point.

Symmetry, then, in the popular sense, is not only not called for in the main (long) mass of a large building, but it is æsthetically offensive, without any value and antagonistic to practical service. Wherever it is found it is bad, as indicating a lack of skill and appreciation of the fitness of things either for beautiful effect or practical ends. It is never pleasing. It is never found in really great works of large extent covering large ground area. It is a vice originating with the elevationist who, with no imagination, being unable to think in perspective, symmetrises speciously a half-furlong of building to a microscopic scale, and is pleased with his production of an effect that no mortal eye will ever behold and still less ever comprehend. Such a person must regret that man is not double-hinged at the toes, so that the recumbent effigy would be "symmetrical." The right use of symmetrical design must be sought, for otherwise it is quite easy to prove that that which is symmetrical is bad art if not positively mechanical and wanting in any evidence of brain power.

Symmetry in the part and in the axis must ever be the guide. We see no symmetry (so-called) in the side elevation of the cathedral, but we do find it again in the transept end, in the central gable and side turrets and other duplicated wings; and here it should be observed that the symmetry arises from the symmetrical plane crossing the main axis of the composition. Planes of symmetry are

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what is required, and these need axes in the plan—symmetry of the part and rigid symmetry or careful balance in the detail.

The ends of planes of symmetry should finish in visual (elevational) symmetry. This may be a rule. It is evidently a guide not to be lightly discarded. The equal-sided end to the axis emphasises the actual axis, confirms its existence. This we want. We desire to know that the main axes exist; they are potent for good in bringing about a unity of effect.

Over-studied "symmetry" destroys character. There is always something of the commonplace in the long (main) composition of centre and wings, of dome and flanking turrets. We seem always to have seen much the same idea before. The asymmetrical composition gains in individuality. It opens up endless combinations for character-formation. There is this much about the long-extended symmetrical façade, that it never gives the effect intended, because any dominant tower or other feature—part of the building, but not along the same front—destroys at once the appearance sought (one imagines) to be given. After all, the reliance on symmetry (so-called) for architectural effect may be compared to a man respecting main laws and behaving in accordance with generally required conditions, but lacking in qualities making for active individual excellence.

Two planes of symmetry, as in a square plan (either actually such or comprising four equal arms) are never pleasing except in towers and monuments, which latter can scarcely be called architecture, not having the necessary interior parts, having no true walls. Such an equal-sided composition always suggests a monument, even, indeed, when it is in reality a true tower, such as we understand this to be. It seems essential for effect that the plan of a building should have a length and a breadth—that is, be far removed from the square.

In place, then, of symmetry as a thing of equal-sided face, we should do well to think more of planes of symmetry and of the geometrical axis and the necessity for pure bi-symmetry as stops to this axis and to all minor axes that may cut the major. This is following the spirit of natural law, and until man is double-ended, or has nose and other features as well at the back as at the front of his head, we need not worry about what is not required—equality of halves in lengthy façades.

There must be some other reason that causes our aversion to forced symmetry, and to at least view with suspicion the too equal-sided work of architecture *on a large scale*. This latter is an important proviso. What is suitable in a small building, that we can easily take in at one view, is not suitable for an extensive work. The cause that we have suggested is doubtless that the several parts of an edifice rarely correspond in their purposes. A central hall and a grand staircase may bisect two series of apartments of equal importance. This seems to be a suitable subject for what might be termed pure symmetry. But taking the cathedral we find a different value is to be set on the nave, the choir crossing and lady chapel and other features. In such case no reasonable shadow of excuse exists for side divisions of equal value.

(To be continued.)

DECORATIVE ART FOR THE MASSES.*

THE subject which I have chosen for my address covers an area of thought and action almost too comprehensive for a short lecture. As I think the matter over, I am constrained to avoid puzzling you with too many details in history or the practice of the purely decorative arts. As far as possible, I shall hope to be practical, at the same time keeping a high standard before myself as well as before you on a subject which is not only of momentary importance, but which must exercise upon future generations influences either good or evil.

That the trade, or, as I prefer to call it, the art of the house painter and decorator in its broadest sense bears with it great responsibility goes without saying, because it deals with matters of every-day concern as applied to utility, permanence, as well as far-reaching lessons on æsthetics.

By the judicious and tasteful exercise of your calling you must exercise influence upon the masses, by a dignified reserve which you can exhibit and inculcate among countless numbers of people more or less ignorant of the highest qualities of pictorial art.

The range of your influence is enormous, even extending from the peasant's cottage to the prince's palace. Granting it to be so you will not tell me that I exaggerate the responsibility of your calling.

In every art, from literature to the humblest handicraft, proportion and reserve play prominent parts. In the decorative arts each section, from the simplest to the most complicated, should be the best of its kind. What is applicable and essential to the needs of one section of a community is not so to another, yet "simplicity" should be the "leit motif" of the most elaborate as well as of the most immature decoration. "Exuberance" has its merits as "plainness" has; each is consistent in its own degree of environment. Perhaps I should define what I mean by the maintenance of simplicity or plainness, even when combined with exuberance. I mean that the underlying structure should never be lost sight of, that the roots of any design in form or in colour should never be masked by or buried under a complexity of ornament. Decoration can be plain and simple without being dull or uninteresting. It can be exuberant also without loss of reserve and dignity.

If I have made myself understood, you will recognise that while I accept elaboration and splendour of design, as well as detail, to be admissive, they are only to be judged so when in agreement with the object they are called on to fulfil or illustrate, and are in harmony with the "status" or "class" of the people they accommodate.

As in life, so in all the arts, ostentation and incongruence are vulgar. By vulgar I mean something pretentious, seeming to be what it is not, to emulate a sphere outside the boundaries of consistent classification.

No decoration should appear to have cost more money than it has done. Directly it does so it is open to the stigma of ostentation, hence is vulgar.

You have many grades, each distinct, to work in and for, many classes to satisfy, small as well as big purses to provide for, from the peasant's cottage to the prince's palace. To supply these numerous grades you must exercise your judgment, so that your work shall appear to grow out of the grade and yet be never vulgar, but conformable with the status of the class or individual for whom you work.

Here let me make it clear to you that the very simplest, most severe, even immature form of decoration, without applied ornament of any kind whatever, may not only be extremely interesting, but impressive. A Quaker lady in her grey satin is, among a blaze of jewels and fashionable women, a distinguished, dignified object. It is partly contrast which makes her so to appear, but partly also that the pure colour is a symbol of a reticent and dignified personality. Let there be placed upon such a lady's dress a sham jewel, or a discordant note of colour in a ribbon, and the charming vision is adulterated at once.

If the dignity of reserve be invaded by sham or the inappropriate, the area of vulgarity is immediately reached.

It is, unfortunately, a truism that we live in an age devoted to innumerable shams, and it is difficult to persuade the unthinking public that their adoption is unnecessary and unavailing, that perfect sincerity, even to severity, can never be vulgar, and may always be impressive.

This preamble clears our ground. You will now recognise that "fitness," "propriety," "proportion," and "reserve" are the articles of faith which it is my desire to inculcate when necessary, and to promote and encourage wherever they are accepted.

Fashion is a deceptive goddess; in no sense is she one of the Olympian deities. Insincere, unstable, full of paradox, alive to innovations, loaded with inconsistencies, she is defiant towards every—even the simplest—law of æsthetics, "fitness."

She leans towards monstrous vulgarities and sows vitiated taste, irrecoverably too often. It is not from the moment, or from passing moods of fashion that we should find our monitors, but from the art of ages, purified by time, accepted by universal experience, that has proved it right to the maintenance of masterpieces of good taste, from which, without copying them, we may tune our own instrument to an essential scale and tone, and find that "style" is the expression of his best in all the arts of man.

* Abstract of a lecture by Sir William B. Richmond, R.A., delivered at Sheffield before the National Association of Master House Painters and Decorators.

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You may ask me what I mean by "style." I mean "proportionate selection," the abnegation of mere essentials, the presence of dignity, beauty, and reserve, the exclusion of unnecessary ornament such as does not grow out of structure, and the inclusion of ornament only where it will enhance the beauty and interest of structural necessities. This is a severe reservation. I give you an illustration of what I mean. Let us project our memories and imagination to an English dwelling of the sixteenth century, perhaps of earlier date—Anne Hathaway's dwelling at Stratford-on-Avon. Here is a well-known type of cottage of a great many which happily still stand unmolested by ruthless changes under a misnomer, progress, and compare it to the comfortless, dull-stupid, ill-built edifice of this progressive (?) age, erected to respond to the needs of a similar class of the community.

It is supplied with stone and brick foundations, solid, strong oak and elm framework and beams, lime-whited walls, furniture severe and strong in design and make, brick or stone, or oak floors, metal utensils in perfect taste. It is a dignified residence, snug and homely, a very type of the agricultural, noble England before our vast smoke-laden cities were in existence and a third part of England had been laid waste by blast furnaces, and handwork had been driven away by the ruthless thud of steam engines, and the unsympathetic, cold produce by machinery. In such a place we are in the presence of a dignified life, free from the "muck rake of wealth," where there is no ostentation or vulgarity; it is illustrating its purpose and in harmony with the modest income of its inhabitant.

Imagine this calm and dignified beauty improved by deal boards, a startling wall paper, a vulgar carpet, a modern firegrate, a slate roof. Should we not ask ourselves if our much vaunted civilisation and claims to scientific and practical progress are quite within the claims of truth? Shall we not ask ourselves whether we have not lost at least as much as we have gained? Our answer will, I think, be that in matters of good building, in many respects of comfort, certainly of beauty and dignity, perhaps also of health, we have more than enough to learn from the life and the artifices of the sixteenth century.

This is one point I lay before you. Now we go on a step further and to an increasingly difficult problem, an enormous population where good taste is practically non-existent, or so rarely as to be hardly noticeable. A great mass of people comprise the lower and upper strata of the middle class. This element, the product of an artificial civilisation, is the most difficult to modify or chasten. It stands badly in need of education in matters of good taste. The middle class of town-bred folk represents a new development; it is composed of possessors of a smattering of commercial education, a smattering of culture; it is a class where narrow views and self-interest are very prominent, where egotism is a faculty, and a narrow groove the chief funnel of restricted ideas, among which anything approaching good taste is too often conspicuous for its absence.

The agricultural peasant may be a boor; sometimes the town-bred middle-class man is a Philistine. The former may have chances of development; the latter is self-sufficient, self-occupied, and unelastic. It is this class which it is within your province and power to educate, but to do so, you and I, who may claim to teach, must have sifted problem after problem and determined what we mean by "fitness," and good taste must adhere to our principles, and when we teach be consistent and strong.

We must know what we like, what we know to be admirable before we can guide.

Again, may I impress upon you that the embellishment of a room, or a house, or a shop window, a church, or palace should not appear to have cost more than it actually has; if it does it is vulgar.

Therein is your difficulty, and as wealth increases facilities for vulgarity grow. As steam engines rotate more and more, the market will be growingly flooded with shams, and until good taste is taught with axioms as definite as arithmetic, and the teachers believed in, supply will equal demand for cheap and nasty, vulgar or glaring design, in preference to what is lasting, modest and beautiful. Setting aside the difficulties which the last paragraph has stated, and recurring to my original statement that you are artists, therefore you should be leaders, I will consider with you the decoration of a sitting-room of a small house of a rent, say, of 50*l*. to 100*l*. a year. The number of such is legion in every large town.

We will say you are called in to paint and generally furnish a room of such a dwelling. The wall-paper will probably be the first item. In nine cases out of ten, supposing you take a roll of wall-papers to your client to choose from, the chances are he will make choice of the worst, the most gaudy, and, at the same time, the cheapest, the most ostentatious appearance at the smallest cost. That will disconcert you. Presently you will be consulted as to curtains, blinds, carpets and furniture. The same difficulty will arise. Your client will tell you "he knows what he likes." That may be so. He may like bad grammar and bad English, but his doing so does not prove that either is correct or desirable.

This is a gentleman that stands badly in need of education. If you are strong through experience and well-earned conviction you may convince; if not, another monstrosity of a dwelling-room will be added to existing millions. For some reason a wall-paper is an undesirable comparison. If of best material and first-rate design it is expensive; good or bad, however, it is difficult to cleanse.

It may be the habitat for germs, harbouring in the old paste a decaying paper. There is disinclination to remove it. Too often, instead of being stripped, another paper is added. Thus a new system of germ is encouraged, and inhygienic deposits are deposited.

There are some excellent distempers which fix powder colour, are washable and permanent; the use of these I strongly advocate. Tints are now obtainable which can be brought into felicitous harmony. I would advise you to select the lightest tones. Under present conditions of the atmosphere of towns and cities, light rooms are essential on every account. It is true that dirt is more visible on light than on dark objects. The dirt is there, a sign that cleaning is needful. Surely it is better to see dirt than not. A visible evil is combatable; hidden, it is dangerous. On the whole, the most effective, healthiest, pleasantest to live in is a white room. There is no white so pure as lime; no product is so successful in the slaughter of offensive animal matter. Lime is cheap and efficient. Every coloured object, save dark ones in large masses, looks well upon white, which, in my opinion, is the safest of all tints to use in large quantities.

A very little ornament skilfully applied in pale and quiet tints will look precious on a white ground. White is the enemy of gloom; its relationship with dark and heavy tints is distant; it seems to ask for, almost demand, a scheme of colour reminding of delicate spring flowers. White is sensitive to every change of direct and reflected light; white walls will almost double the appearance of the area they environ. It is exhilarating to the nerves and a constant æsthetic comparison, as every change of light will enhance or modify the colour of reflected light, producing delicate tints on the surface from pale violets, blues, rose colours and orange, and the luminous grey it assumes in shadow is always restful and beautiful. I ask you to give attention to this suggestion.

We all know that white lead, mixed with oils or varnish, becomes in time discoloured, often in disagreeable patches, and finally degenerates into a nasty putty colour. I recommend the avoidance of oil or varnish and white lead on walls. The washable distempers to which I have alluded supply a want and deserve given attention and renewed experiment. I see around me many instances of the success of washable distempers.

Painting of wood deserves attention, and must be done with judgment.

We all know that in old days woodwork was invariably coloured; but between it and the pigment was laid a thin ground of "gesso," or plaster and glue, whereon tint and gilding were applied, rarely, however, mixed with oil or varnish.

No doubt this system is a preservative one against damp and the worm. So many instances are easily accessible to give that I need not enlarge on this subject, save to say that ornament on or the colouring of wood is a delicate problem. However, this much we all agree to, the colour it receives must be in harmony with the walls, neither too much darker or lighter, however different the tint may be.

If the tone of the colour is in excess either way, it will make a spot and injure breadth, so essential to all good colour decoration.

A blue room will stand a good deal of red, if the red and blue are nearly alike in tone value. Much red in a green room will prove inharmonious. In a white room pale blues, yellows, cool roses and greens will harmonise better than any red which approaches a terra-cotta tone. Before you attempt ornament—that is, pattern—the colour of the walls and woodwork must be determined and executed. Then a very little judicious pattern will suffice to satisfy the eye, please the sense and gratify the fancy; but ornament should come

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last, not first, and appear to have grown out of the structural tones of colour.

It is undesirable to varnish woodwork; it had better receive a subdued polish. This is attained when the paint is quite dry by covering it with a thin coat of wax and petroleum; a delicate polish can be obtained by rubbing the surface gently with a soft old rag.

You will observe that I have only incidentally alluded to ornament.

Of course, in every instance one would prefer freehand painting to any artificial substitutes, but the best freehand painting is expensive. On woodwork I should certainly deprecate any but hand-painted patterns, but upon walls, as dado or frieze, stencils may be used. It is, however, useless to attempt to mask the monotony caused by any mechanism, though some of its more disagreeable adjuncts may be ameliorated. Stencil should remain obviously stencil. I have seen very agreeable results obtained when it has been frankly adopted, and I do not think that stencil as a cheap factor for tasteful and inexpensive pattern decoration has received the attention and amount of experiment it deserves. It has one obvious merit, flatness; it has another, "fancy" may be let loose and be pretty freely exercised within certain limits. Stencil has another possibility, it permits the use of a great variety of tints which may be so agreeably varied that the machine-like monotony of line design may be modified, even rendered useful and charming.

I can imagine a Japanese artist using the stencil as a colour agent with the distinction and delicacy he employs in the art of colour block printing.

I have said nothing about the use of gold as a pigment. Real gold is expensive, and no shams must come into our scheme.

A word or two about the framing of prints or photographs. Pictures do not come within the limits of expenditure in the case we are considering; better no pictures than bad ones. When we consider the cheapness of good photographs taken from the best existing art of all kinds of architecture, sculpture, painting and all the allied arts, and the reprints of engravings, the walls of a room may at very little cost be furnished in their reproductions of the masterpieces of the ancient and modern world. Photographs and prints tell best on a white wall if their margins are kept quite narrow. The touch of colour may come into their frames, which may be narrow reed pattern, coloured black, red, green, or blue; thus they may become pleasant notes of local colour which will redeem from monotony the quiet tints of the walls, furniture and woodwork.

A word on carpets and furniture. In carpets there are, I confess, in my opinion, few English which are interesting in design or satisfying in colour, but now the constant importation of oriental rugs renders good material, fine design possible to a limited purse. A carpet which covers the whole floor is surely undesirable. The dirty habit in the north of retaining the same shoes on our feet within our rooms that we wear out of doors is productive of the importation of dangerous germs and filthy produce where this should be sedulously kept out. To be really clean and healthy, carpets should be taken up once a week and the floor scrubbed.

There are some simple patterns of linoleum, a good wearing substance, quite inoffensive in design. These I advocate from experience, especially if they are waxed as wooden floors are, and then polished.

As to furniture, the simpler the better, always of unvarnished wood, and without distressing swirls and inconvenient edges so common in that much-to-be-deplored "L'Art Nouveau." A long settee made of pine, painted or stained an agreeable colour, furnished with a mattress and plenty of cushions, will form an admirable sofa, providing room also for several people to use as a seat. Where electric light is used, its fittings should be of metal and of simple design.

Here, then, I have given you a type of a dining or sitting room. If some of you more accustomed than I am to provide estimates will calculate the cost I suspect it will prove to be moderate and within the limits of expenditure suitable to a small income. It would be a room into which a person of good taste might be ushered and not wish himself away, and one which should encourage good spirits, good health, and would with careful management be kept clean and orderly.

The public is ever shifting and changing, because it does not really know what it wants. Like a tiresome child it wearies of toy after toy, even of the most extravagant and monstrous.

And in my opinion amelioration must begin from below; it must commence with the masses, not with the exceptions. It must begin where there is not too much money to waste, too little for extravagance and display, but enough to provide a wholesome, chaste decoration which shall have at the root of it refined selection and dignified repose without dulness.

The step in that direction must come from elimination of meaningless ornament, from an attention riveted on essentials, upon breadth of effect, simplicity of means, discrimination and good sense in matters of all design in whatever material.

Then people will begin to comprehend the word "fitness" which I have so often used to-day. And instead of vagaries we shall become used to good proportion, reserved forms, colours which are adapted to tone, and each special quality which gives its charm to every art in its right place, in its proper environment, being adapted to the grade in society that employs it.

COMPETITIONS.

MR. EDWARD CRATNEY, of Wallsend, has been awarded first place in a local competition for the design of new premises for the Newburn Urban District Council, Northumberland. Mr. Cratney will act as architect for the work. The second premium of 10*l.* has been awarded to Messrs. Marshall & Tweedy, Newcastle. Sixteen designs were received. The assessor was Mr. R. J. Leeson.

ILLUSTRATIONS.

SELECTED DESIGN FOR THE EXTENSION OF TOWN HALL, GRIMSBY.

WE illustrate this week the selected design by Messrs. EADE, JOHNS & BROWNE, of Ipswich, a description and criticism of which appeared in our review of the competition drawings last week.

OXFORD COLLEGE SERIES. BRASENOSE.—FROM HIGH STREET—CHAPEL QUAD.

WE now resume the publication of our series of views of the colleges of Oxford, and next week we shall give an historical account of Brasenose College, which we are now illustrating.

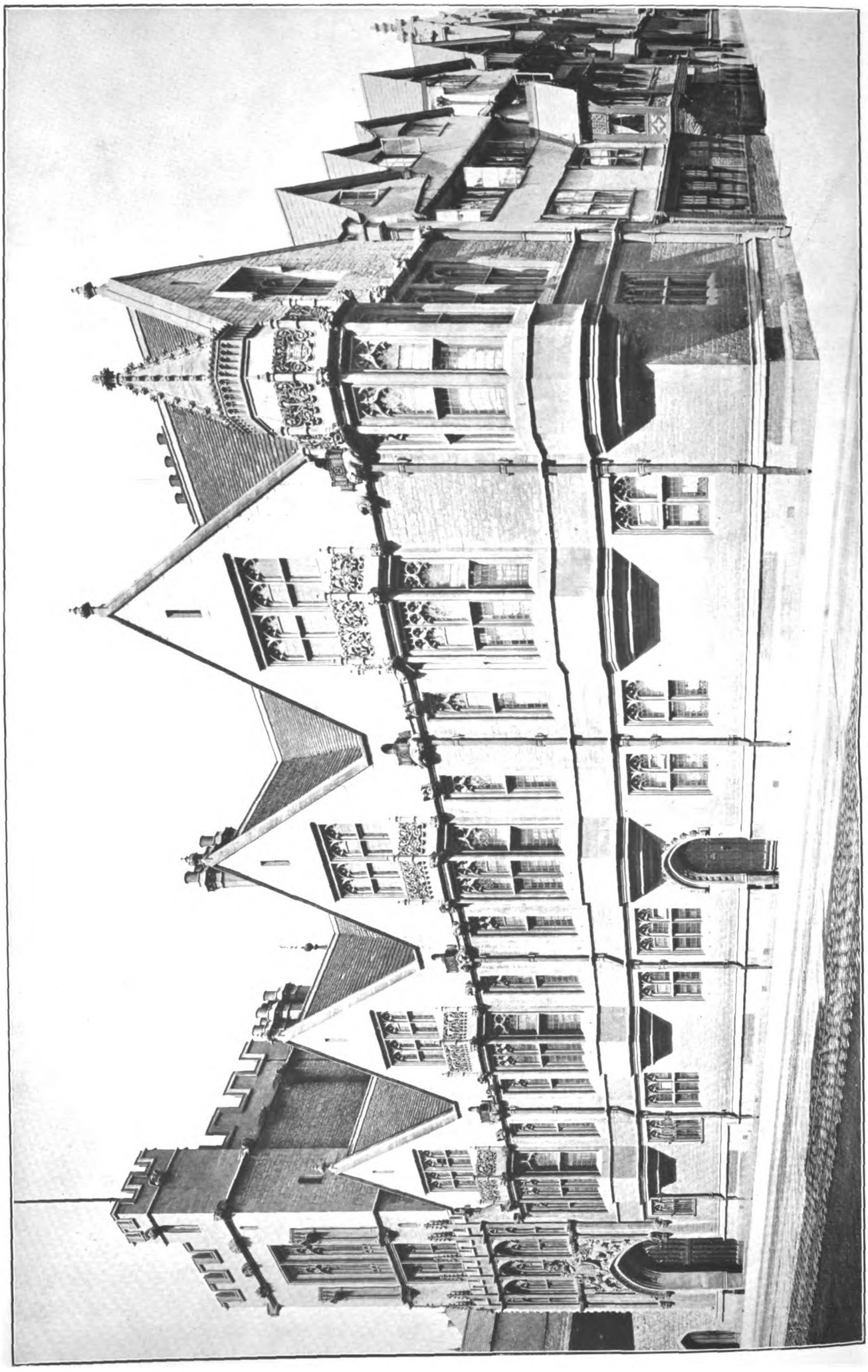
GARDEN FRONT OF HEATHCOTE, ILKLEY, FOR J. HEMINGWAY, ESQ.

THE drawing we reproduce was exhibited at the Royal Academy by Mr. EDWIN L. LUTYENS, the architect of this house. The design is evidently based upon the general feeling and to some extent the detail of an Italian villa, but the band of tile roofing over the entablature of the Order is, we take it, an experiment that does not seem to us quite successful, as it cuts the façade distinctly into two portions that do not look happy parts of the same design. The house is built of Blue Morsley stone from Guiseley, and the tiles were obtained from Holland by Messrs. VAN STRAATEN & Co., of London. We venture to think that in this design Mr. LUTYENS has made a mistake, but the deservedly high reputation he has attained as an architect of English homes has been obtained in part by daring originality and experiment, usually, in part by daring originality and experiment, usually who never made a mistake never made anything." The formal garden with its treatment of varying level is both clever and pleasing.

Mr. Charles F. McKim, senior partner of McKim, Mead & White, architects, died last week in his sixty-third year. At the age of eighteen he entered the office of Mr. Russell Sturgis of New York, and after a few months joined the Ecole des Beaux-Arts where he remained about three years. In 1872, being then twenty-five years old, he set up an independent practice. Five years later he was joined by Mr. W. R. Mead, and in 1879 by Mr. Stanford White. During 1901 and 1902 he acted as President of the American Institute of Architects, and in the following year Mr. McKim was awarded the Royal gold medal of the Royal Institute of British Architects. His own work and that of his firm marks an epoch in American architecture and has won the sincere admiration of his English confrères.

The Extensive Alterations to the chapel of St. John's College, Battersea, as designed by Mr. A. H. Ryan Tenison, F.R.I.B.A., were dedicated by His Grace the Primate on Tuesday last.

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OXFORD COLLEGE SERIES. No. 53.—BRASENOSE, FROM HIGH STREET.

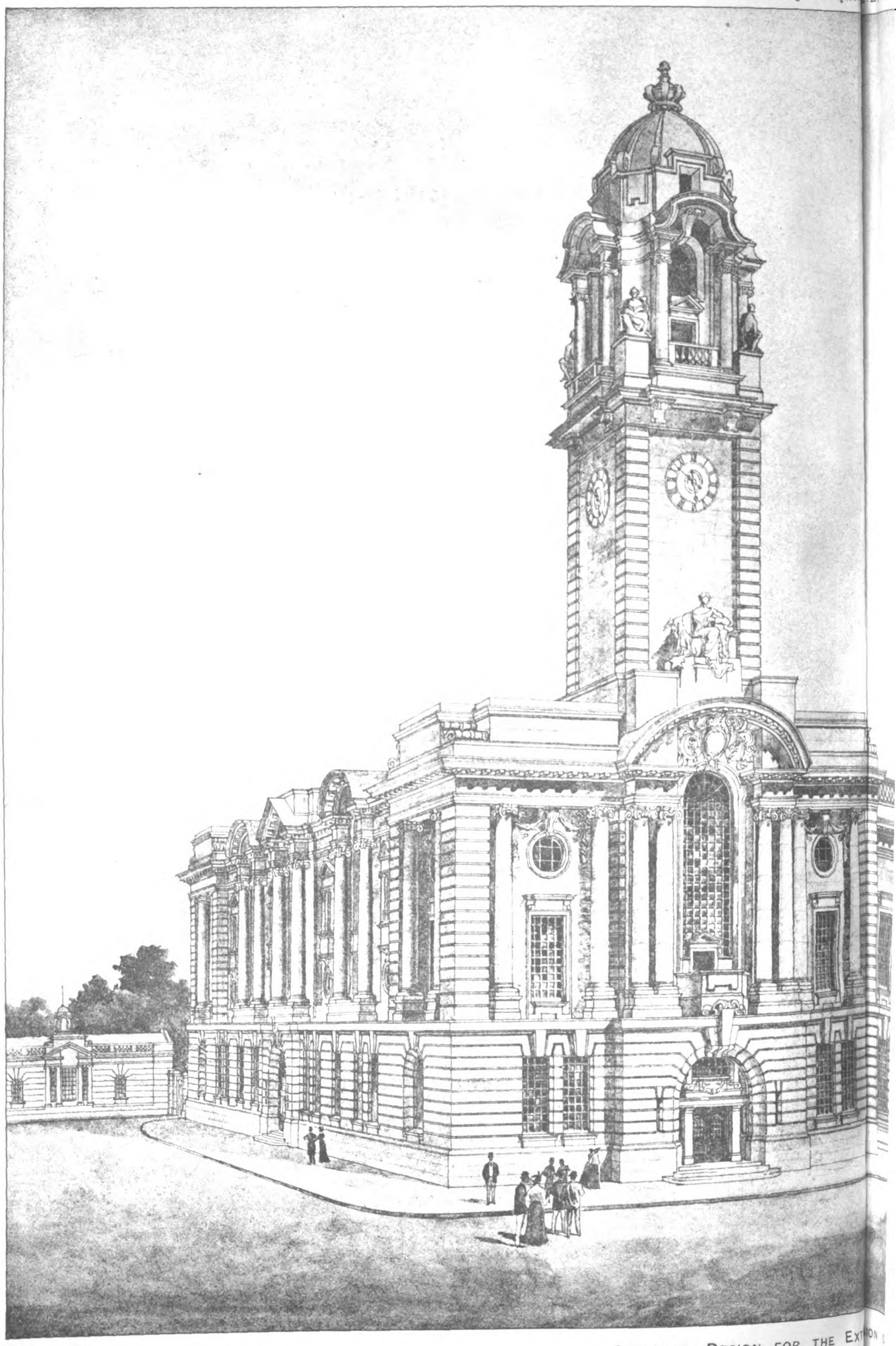
Photo by A. R. WALLIS & SON, 60 Doughty Street, W.C.

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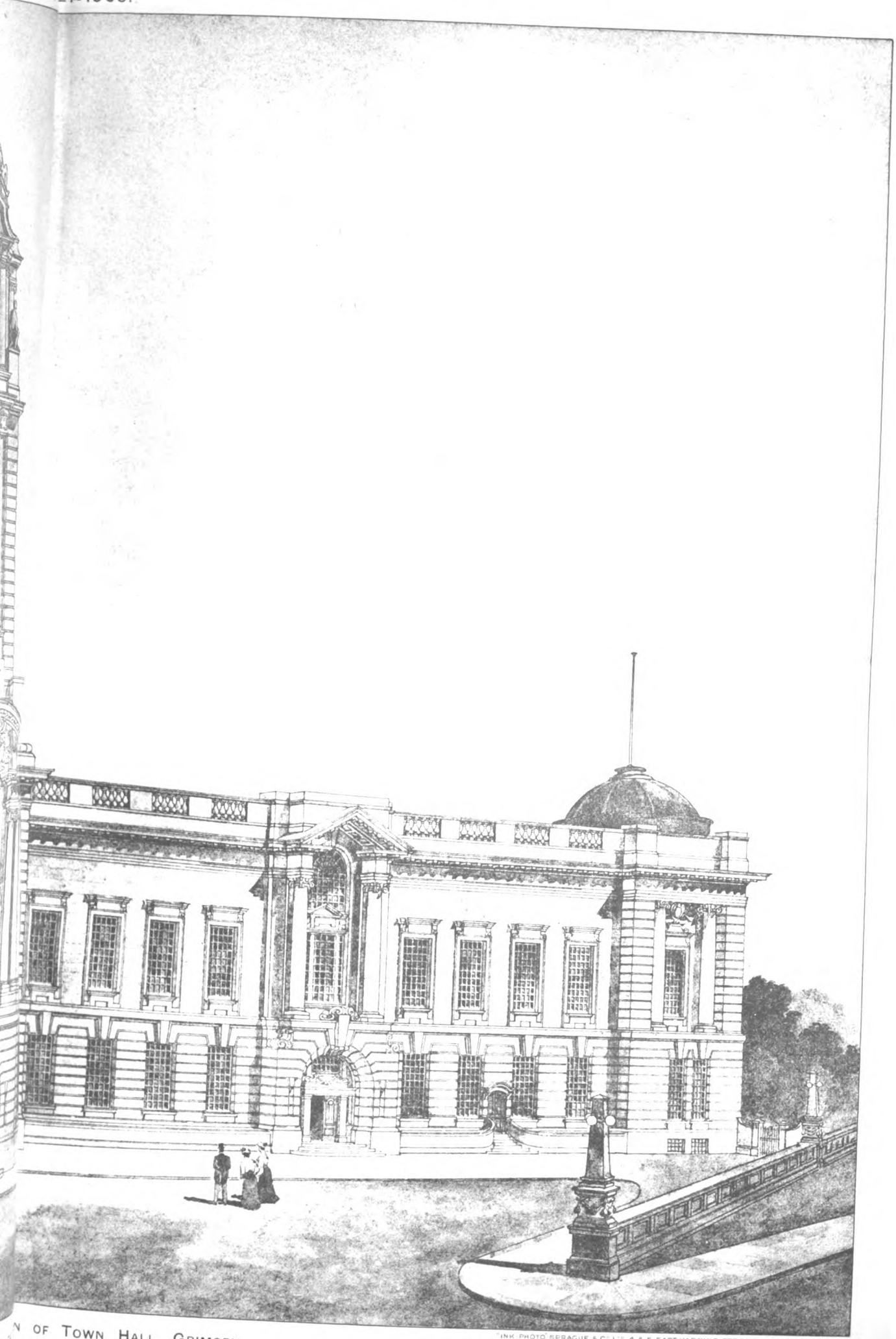


SELECTED DESIGN FOR THE EXTENSION

Messrs. EADE, JOHNSON & BOWES

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24th 1909.



N OF TOWN HALL, GRIMSBY.

WNE, Architects.

"INK-PHOTO" SPRAGUE & Cº L.ᵀᵈ 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

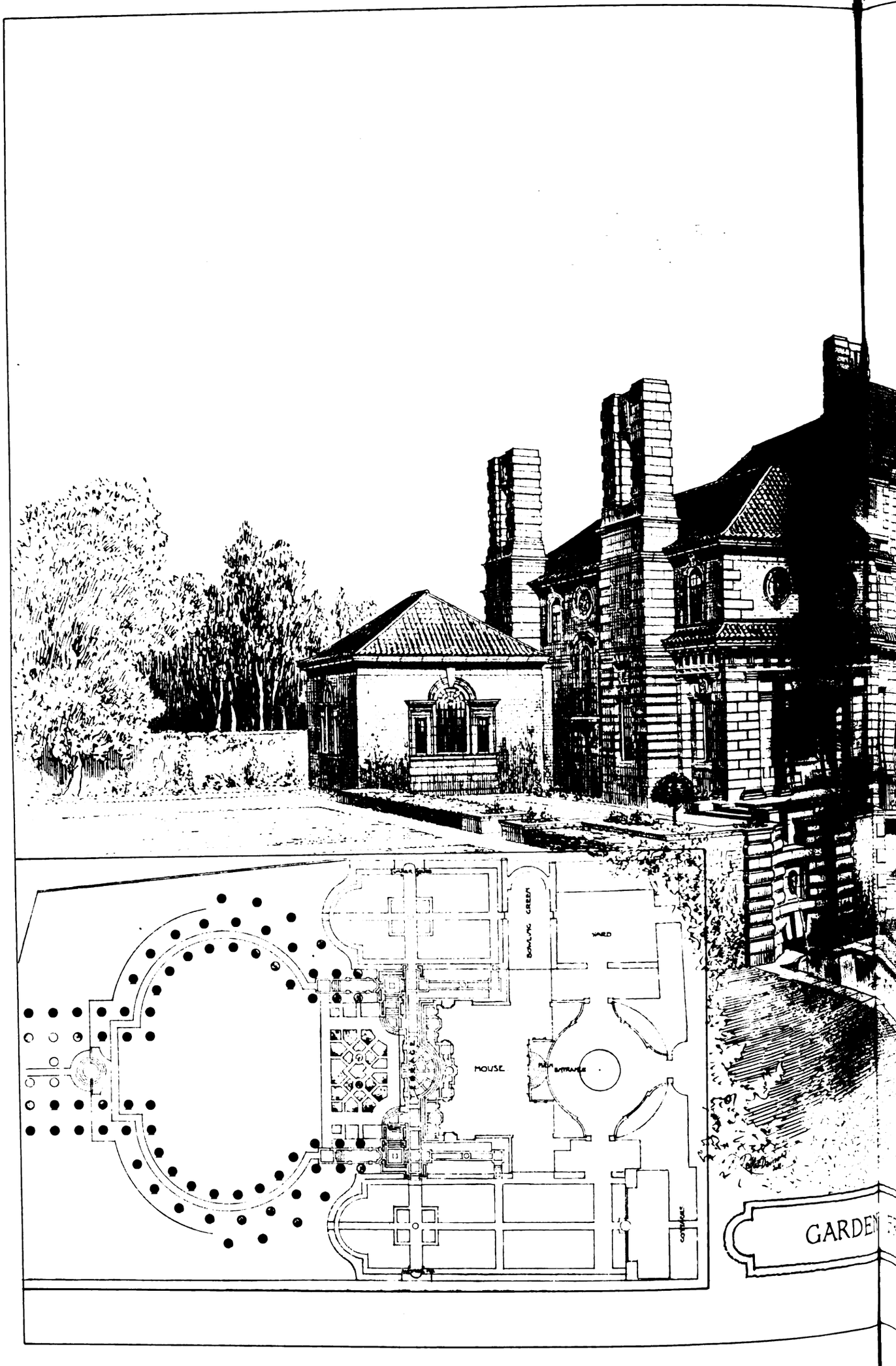
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FRONT OF HEATHCOTE ILKLEY FOR J HEMINGWAY ESQ.

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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GROUND PLAN

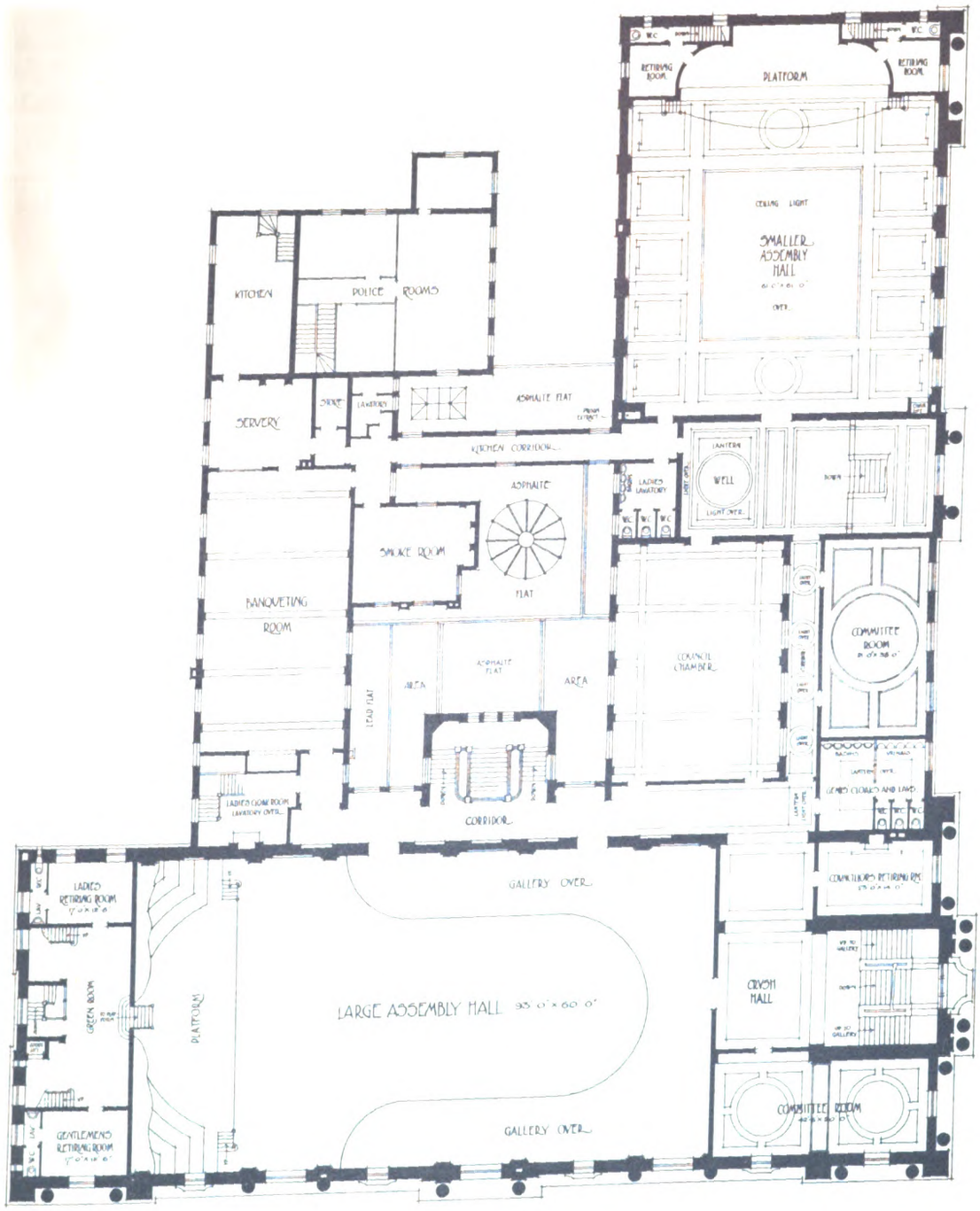
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SELECTED DESIGN FOR THE

Messrs EADE

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Sept 24th 1909.



FIRST FLOOR PLAN

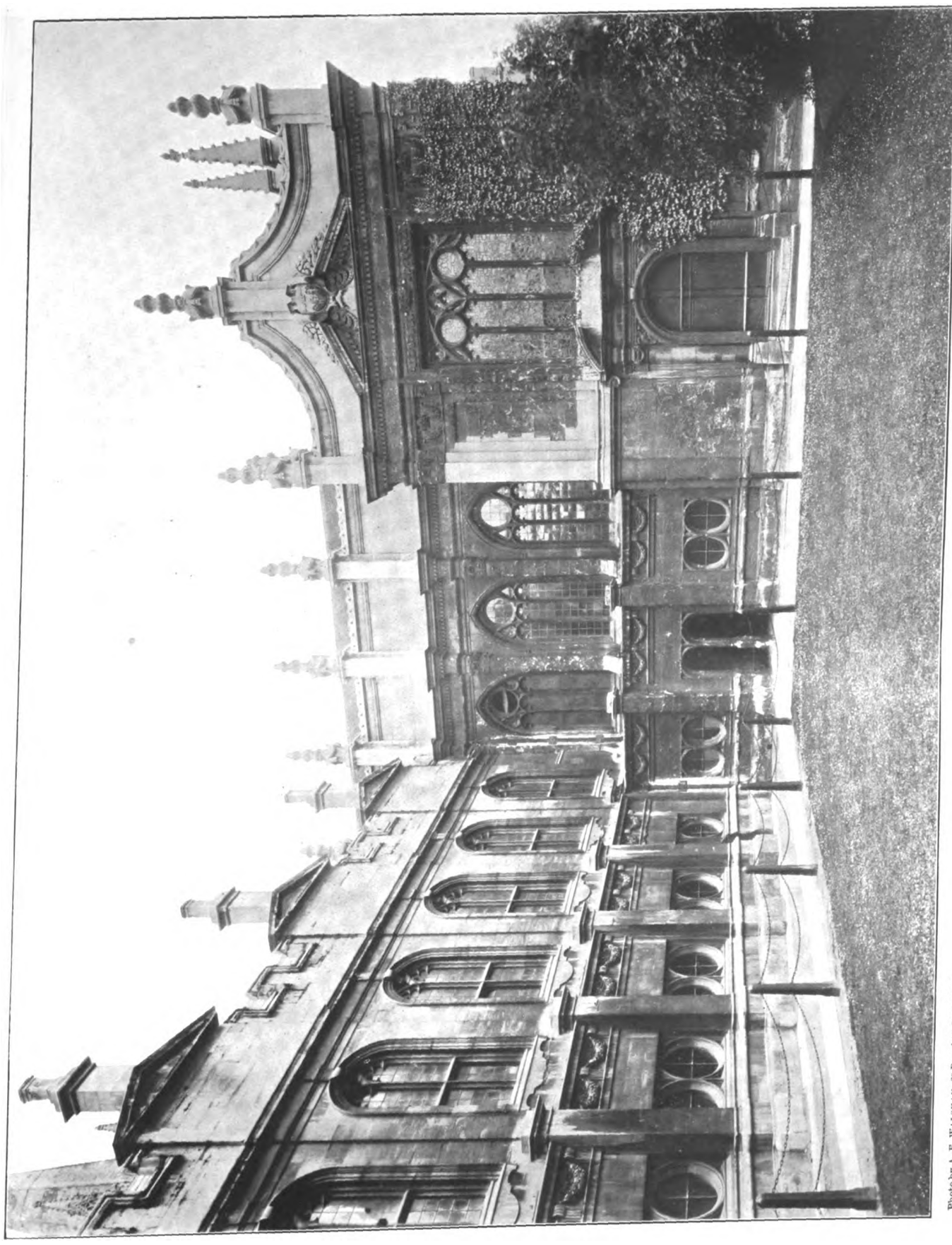
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...SION OF TOWN HALL, GRIMSBY.

BROWNE, Architects

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OXFORD COLLEGE SERIES. No. 54.—BRASENOSE: CHAPEL QUAD.

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THE USE OF FERRO-CONCRETE IN MONUMENTAL ARCHITECTURE.*

(Concluded from last week.)

Construction of Pillars.

THE construction of pillars by means of pieces of artificial stone prepared beforehand can be omitted from our consideration, because this would only be a substitute for pillars of stone or brick without expressing any characteristic properties of concrete and its mode of construction. But these properties can be manifested in the construction of pillars in casting moulds *in situ*. The division into base, shaft and capital is no longer so important for the design of columns, as the whole pillar forms one block produced in one piece. We need only consider the æsthetic requirement of a division of too long lines, and this can be fulfilled by flat cinctures, which enable us to distinguish the parts of the pillar, although they are not necessary to strengthen the construction.

With regard to the transverse section of the pillar, we begin with the simple square or rectangular form, and we may obtain decoration by pieces inset into the casting-box, such pieces having the form of rectangular channels or quarter-pieces, the use of which leads naturally to the production of

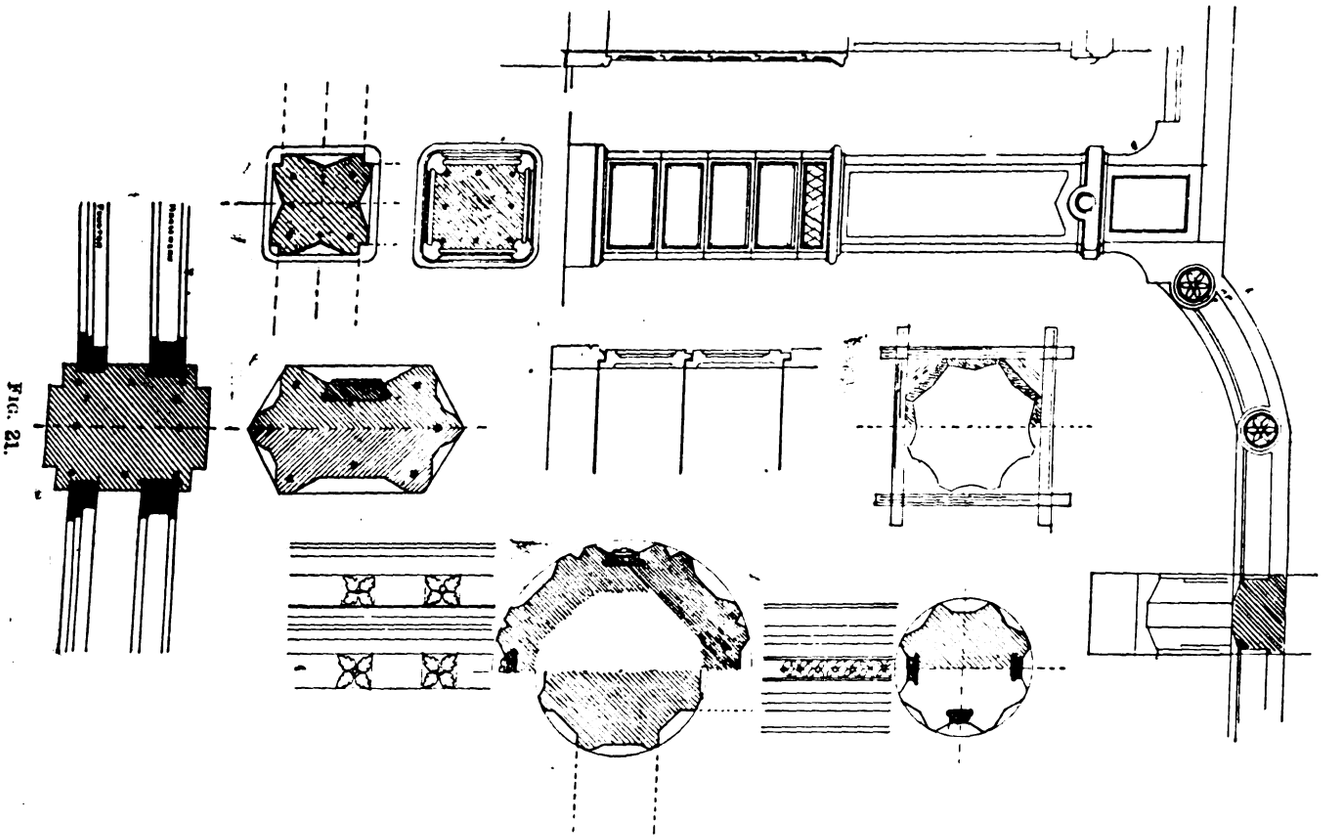


FIG. 21.

plain or star-like forms, which may be considered polygonal pillars or paraphrases of the round columnar pillar (fig. 21).

The connection between the pillar and the beam has also to be considered, and by means of console-like forms the expression of the pillar's function may be brought out (fig. 22).

Forms obtained by insets in the casting mould stand in close connection with the use of decorative pieces cast in concrete.

The pillars could also be partly formed with a kind of socle by putting together flat pieces of concrete which were made beforehand and which might be appropriately decorated, these pieces being joined by means of dovetailed connecting members and by grooves and feathers; the hollow space formed by the pieces, which is really the pillar, is then concreted.

Construction of Entablatures.

To meet the necessity of protecting the building in our climate from influences of weather by means of projecting roofs, and where this is not possible by means of cornices, concrete affords the possibility of forming appropriate shapes. The concrete corona made in the casting mould has to be given through appropriate enlargement an architectural bed mould, the lack of which is often felt very much; the projecting form in concrete need not be much divided, it may even be arranged in connection with the frieze. The lower parts can be partly formed as separate pieces, or might be included in the concrete casting (figs. 23*a* to 23*f* from the Law Courts at Brünn). The capacity of concrete for taking any shape in exactness and sharpness, giving the form in its fullest beauty, and not requiring any finishing, has been proved by a test made to produce decorative guards for hot-air tube and ventilation openings in the halls of the Law Courts at Brünn. These were produced in gelatine moulds. In order to carry out a suggestion made to me, an attempt will be made to utilise sand moulds for the casting of concrete much as they are used for casting metal.

The capacity of concrete for making easily and at a low cost highly ornamental forms would render it possible to take up again traceried treatment in architecture, following in an attractive way the decorative forms of the Gothic style. In connection with tall pillars or bay windows, church windows and also staircases, &c., a favourable opportunity would be given for its use.

Construction of the whole Building.

There is yet another question to be considered, and that is the real influence of ferro-concrete construction on building as a whole. In the suggestions put forward in the foregoing article concrete is not only treated as a material for ceilings, pillars and supports, but I have also endeavoured to show that concrete construction has a distinctive manner of expression.

In the study for a church design, which we have before us, and which is of basilican type with low aisles, besides the walls of the aisles the pillars are carried out in cast concrete, the ceilings of flat concrete in the aisles, and of coved concrete in the nave. The upper part of the high walls is stiffened by means of concrete buttresses, which would divide the load equally between the walls, reinforced by pilasters, and the nave pillars (fig. 24).

* Translated from a lecture given at a general meeting of the Austrian Society of Engineers and Architects by Alexander Wielemans Edler v. Monteforte, architect.

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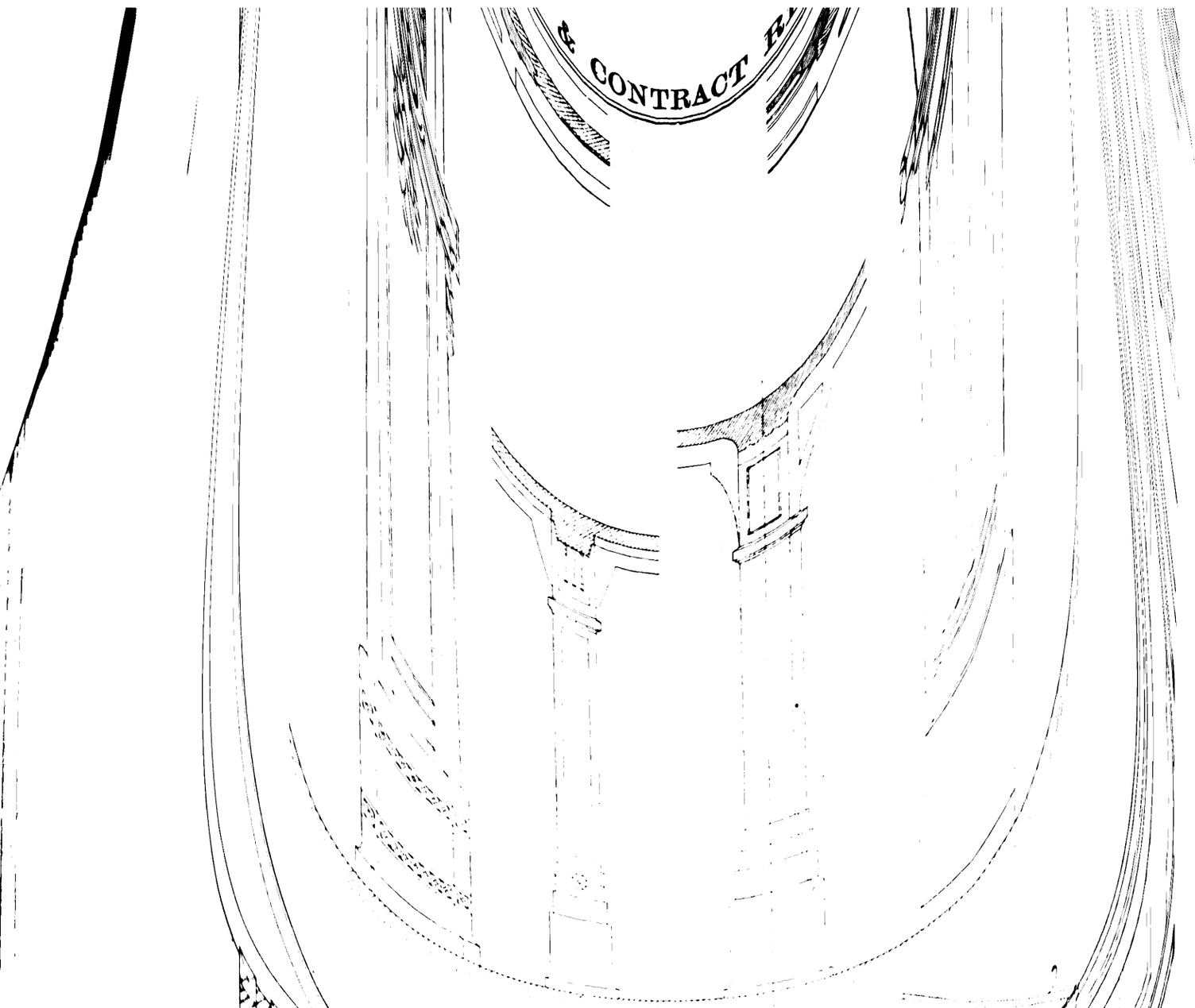


FIG. 22.

FIG. 23 *a*.

FIG. 23 *b*.

FIG. 23 *c*.

FIG. 23 *d*.

FIG. 23 *e*.

FIG. 23 *f*.

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The execution of the concrete ceiling both in the model and in concrete, together with all tests and studies, has been carried out in the most careful manner by sculptor H. Koch, of Vienna.

The author does not deem his studies as yet concluded, but reserves to himself the pleasure of referring later on to studies already partly begun relating to the influence of ferro-concrete construction on the exterior of buildings, on the form of windows and doors, on oriels and towers, &c.

In reference to style, I should like to say that whilst the idea of inventing new styles has been dropped, the endeavour to express the "material style" as such remains; but at the same time in the expression of concrete construction certain details of a special kind have been brought into existence, and thus the nature of the material has been taken into account without incurring the danger of wandering into a labyrinth of styles.

The author has been especially prompted to express his views on the artistic ideas germane to concrete construction which now engage the thoughts of many people, in order that others who are following the same or similar lines may give their experience and the result of their studies to the experts. (This has already been done at the Eighth International Congress of Architects.)

But the question can only be developed further if engineer and architect are working together. In order to achieve this our Society, which has amongst its members both engineers and architects, is surely the most suitable forum.

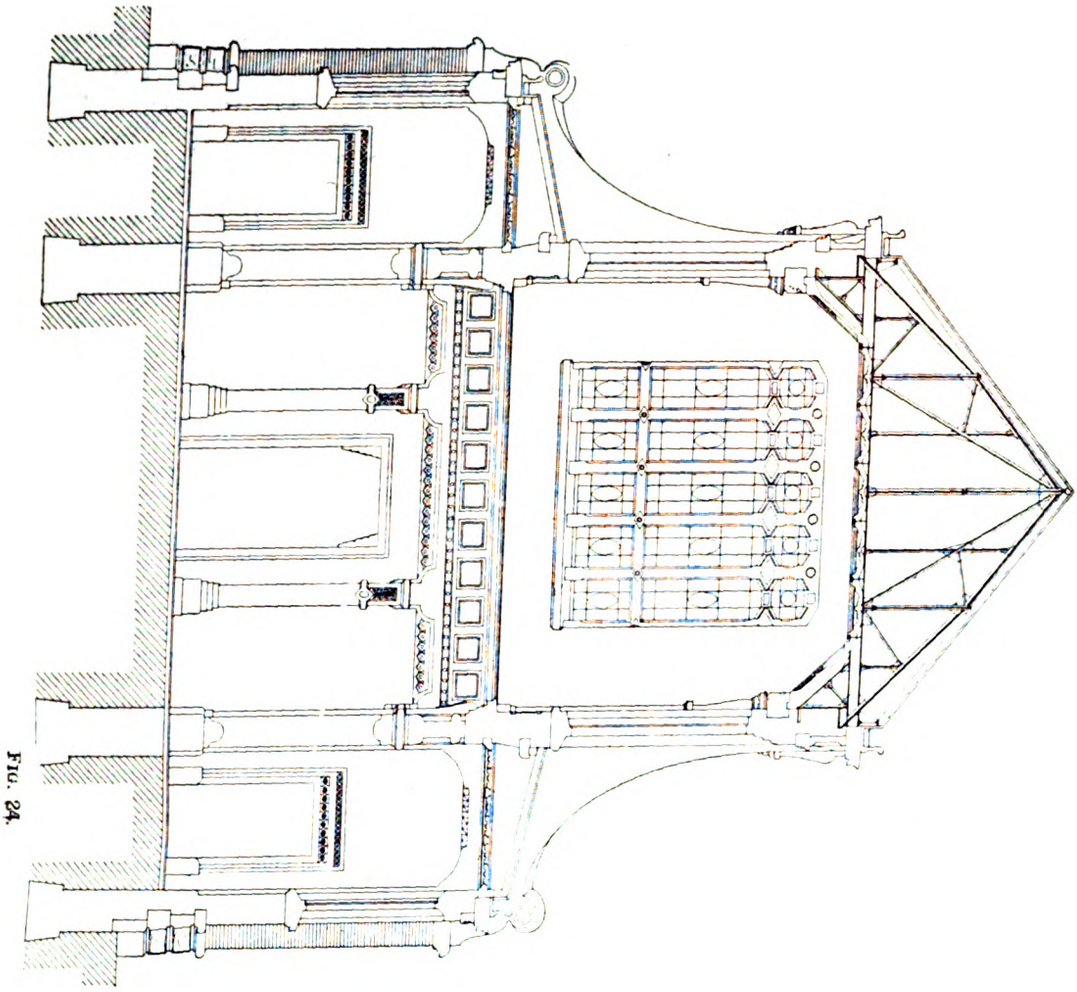
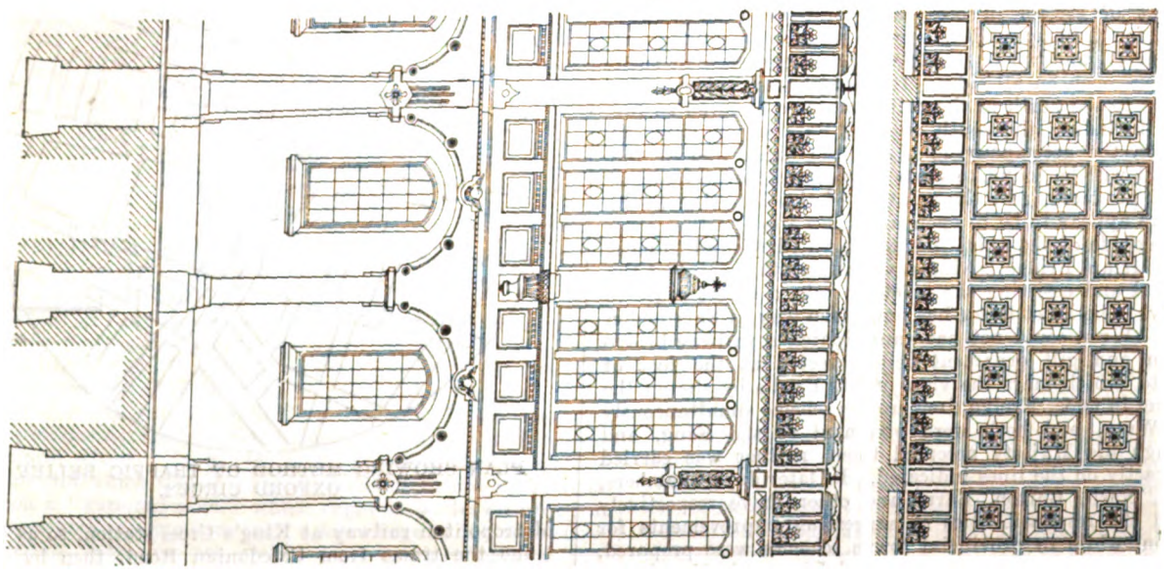
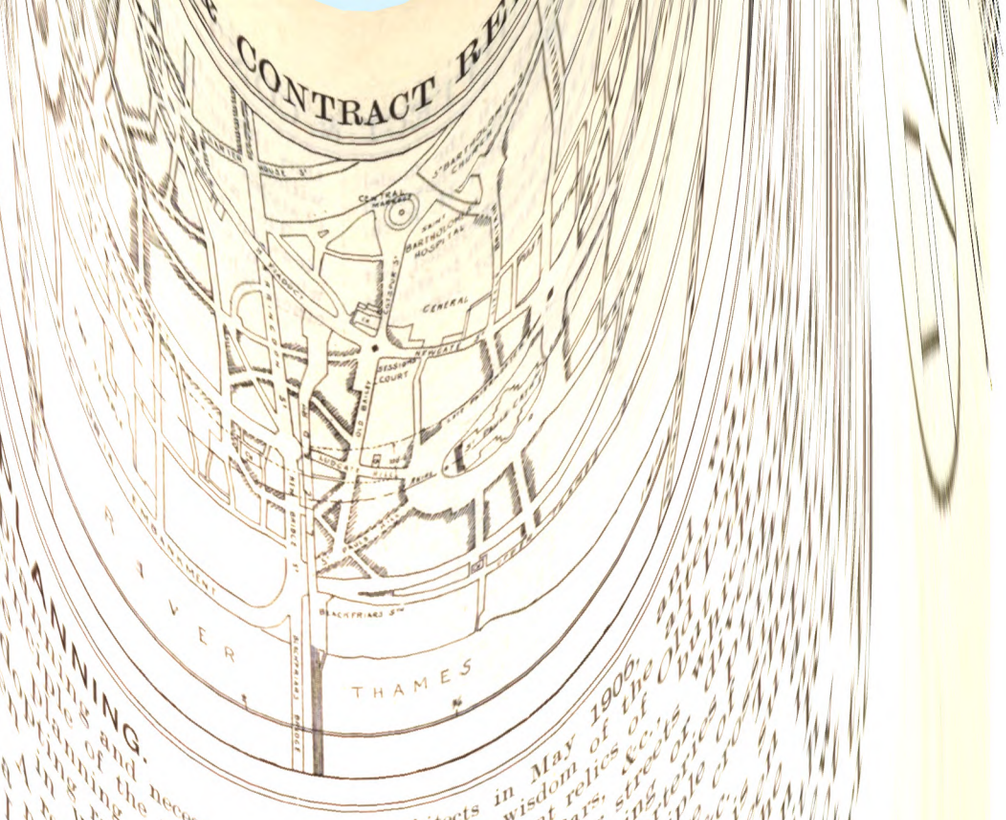


FIG. 24.



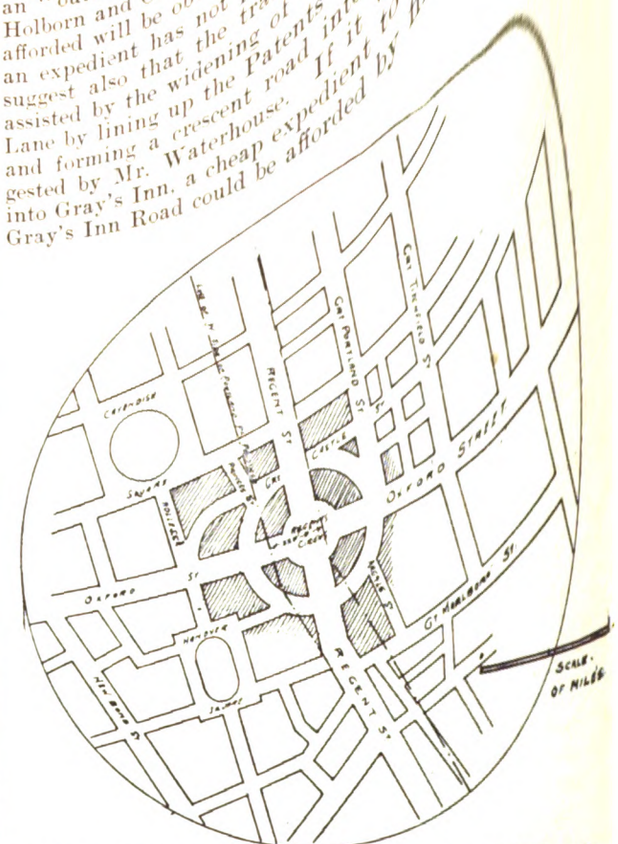
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TOWN PLANNING.

and necessarily inter-
the axial line, more
of buildings and
radiating lines from a
Wren's plan of London
retrospect over the last three
of eminent architects
Inigo Jones is said to
Whitehall Palace and St.
Paul's, Covent Garden;
fields, and we know him to
later occupied his attention for
investigation and amid much opposi-
tion. Whitehall was demolished in 1633, and
the "Three Cathedrals dedicated to
announcement raised by Archbishop Laud,
cathedral and in compensation
houses demolished," which
Wren.

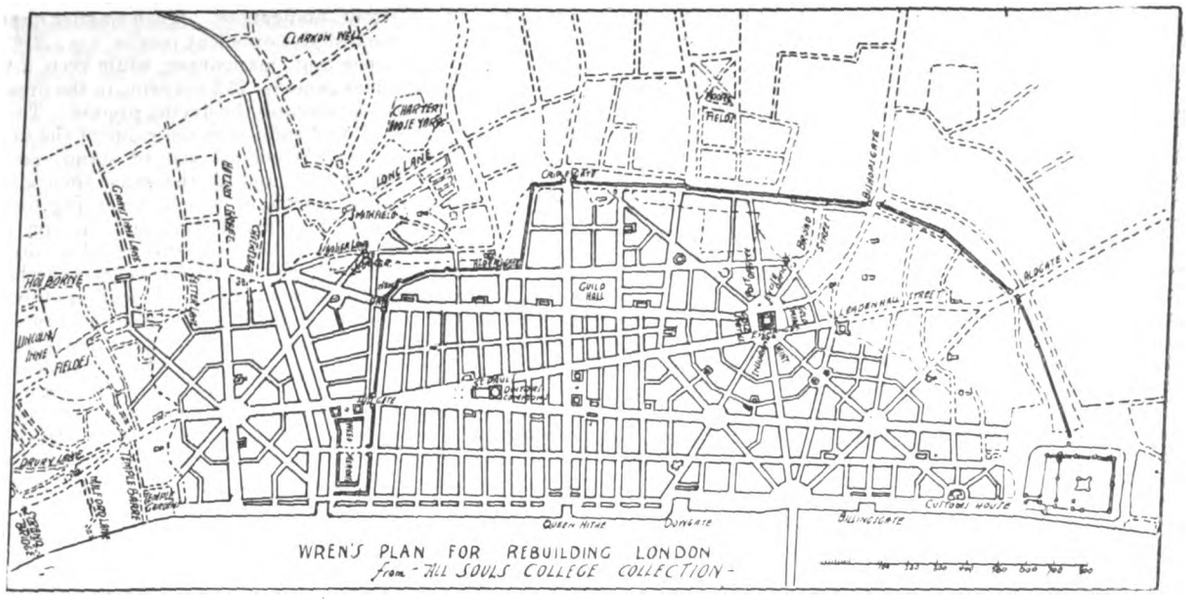
Wren's plan are worthy of consideration,
hardly applicable to London to-day.
widening of Ludgate Hill in wedge-
which, curiously enough, corresponds with the
Bernini's colonnade to St. Peter's, Rome; the
streets in octagonal form as a subsidiary
traffic round a circus; and his avoidance of
where possible placing churches in such
angles, and where possible placing churches in such
open on all sides. It would be advisable if the
to the north of the cathedral were removed as far
way for Wren's plan are worthy of consideration,
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where possible placing churches in such
angles, and where possible placing churches in such
open on all sides. It would be advisable if the
to the north of the cathedral were removed as far
the south side of Paternoster Row, as
accompanying plan; the axial line of the
will be found to cross the centre line of Ludgate
and the solution of the difficulty would
therefore appear to be to open up a new road on the corre-
sponding side of the axial line which will be found to meet
at Blackfriars Bridge, giving a vista from this point of the
cathedral and assisting the traffic to take a direct route to
the city. The Fleet River has now given way to Farringdon
Street. Wren could not have anticipated a railway bridge
of iron and gilt ornament being erected at the foot of
Ludgate, which mars the view of St. Paul's by slicing the
building in two. Evelyn drew up his scheme simultaneously
with Wren, and both were presented to the King, and
although his Majesty accepted them, neither was carried
out exactly on the lines indicated. In later days Chambers,
Soane, Nash, Burton, Barry and others have respectively
shared the responsibilities of suggesting improvements for
London, while in provincial towns schemes were prepared,
such as that by Wood of Bath, and Liverpool, Manchester
and Edinburgh have had some attention in this respect.
To come to more recent times we have to be thankful for the
wave of feeling which has influenced the improvements to
St. James's Park and for Kingsway, and the proposals of
the Royal Commission on London Traffic. Mr. Paul Water-
house has dealt with this last-mentioned subject in a most
exhaustive paper read before the Royal Institute of British
Architects in May 1906, and which has prompted
him in the wisdom of the
avoid the ancient relics of
house, Holborn Bars, &c.,
smaller and narrower streets
sideration as to widening
affected by the two great arteries
ing plan exhibits the principle
an "outer circle," to all large
Holborn and Oxford Circuses,
afforded will be obvious, and one
an expedient has not previously
suggest also that the traffic from
assisted by the widening of Gray's
Lane by lining up the Patents Office,
and forming a crescent road into
gested by Mr. Waterhouse. If it were
into Gray's Inn, a cheap expedient to afford
Gray's Inn Road could be afforded by



PLAN SHOWING METHOD OF TRAFFIC RELIEF AT OXFORD CIRCUS.

Metropolitan railway at King's Cross station, so as to continue the trams from Caledonian Road, then by cutting back the houses next Morrison and Sidmouth Streets on the west side of Gray's Inn Road to line with the west side of Doughty Street, thus making a direct route through John Street and Gray's Inn, and by means of a crescent the traffic might be diverted into Holborn or across into Chancery Lane. The widening of Fetter Lane and a diagonal road north and a similar treatment at Gresham Street, which might be connected by a road from the south corner

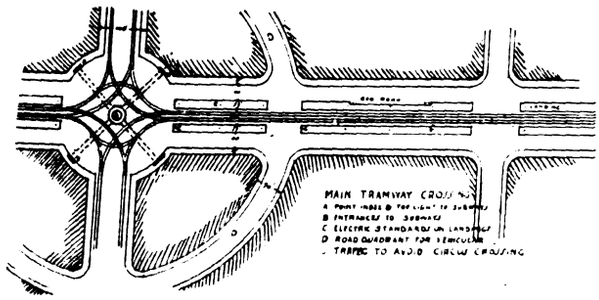
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of the General Post Office, would take the traffic into Finsbury and relieve much of the congestion of Wood Street and London Wall.

To start with a clear sheet, however, is a very different matter, and Mr. Lanchester has shown us in a recent paper he read before the R.I.B.A. in February last how the "Grand Manner" can be applied. His architectural Utopia reminds us of Hippodamos, who, Aristotle tells us, contrived "the art of laying out of towns," and was "the first author who wrote a treatise concerning the best form of government." Mr. Davenport Adams says he "designed the town of Peiræus," while another translator of Aristotle tells us he "separated the Pireus," but whichever may be correct, his name has been handed down to posterity in connection with this town by the district, apparently named after him, viz. Hippodamia, which is between the town on the peninsula and the long walls that lead to Athens. Piræus being the port of Athens, the work of Hippodamos must have been of considerable importance.

The importance from a commercial standpoint of a well-laid-out town plan is fully realised in America, where great efforts are now being made in this direction, especially at



Pittsburg and San Francisco, at which latter place no less than 25,000,000*l.* was spent last year alone for this purpose. It is very doubtful if much of the "Grand Manner" will be realised in London even in the near future, unless the Royal Traffic Commission's proposals are considerably modified and speedily adopted. Alterations in London are only effected after great pressure is brought to bear upon the authorities by the exigencies of the traffic problem, and even then the improvements are piecemeal and based apparently on no definite scheme. Is it not time, therefore, that a scheme were laid which should form the basis of future alterations upon a "rational plan," which ought to be drawn up by a representative committee with a knowledge of the respective interests both for art and commerce which govern the problem? Such a system would obviate the present indefiniteness, and the increased traffic facilities would be able to have consideration as to the most advisable way to provide for it.

Our squares and parks—the lungs, so called, of London—have a peculiar sameness which renders improvement difficult of suggestion. The former are for the most part far too small to be a pleasaunce, in the strict sense of the term, of any real use, and often too narrow. The best lay-outs are perhaps Lincoln's Inn Fields and Hanover Square, though in the latter instance the complete success is marred by the cramped surroundings of St. George's Church. Public opinion has severely criticised Mr. Speight's suggested improvement to the Horse Guards Parade and that portion of St. James's Park immediately contiguous to Sir Aston Webb's present alterations. It is a great pity this should be so, as we are far behind our Continental brethren in this respect, and suggestions of this nature are not to be lightly thrown aside. A good start was made to form and preserve open spaces based on an architectural theme by Sir Charles Barry when he laid out Trafalgar Square, and although he submitted a scheme for the raising of the National Gallery, inter alia, which, like Wren's plan of London, was rejected, he was placed upon the Royal Commission formed to investigate the best method of providing additional room for the museums, his suggestion being that they should be grouped at South Kensington, which project was adopted, but not until long after his decease.

With Mr. Brock's fine statue to Queen Victoria and the fountain in front of Buckingham Palace it is to be wished that an appetite for greater things will be given to the general public, even to the realisation of the hope of Soane, to wit, a new royal palace, which shall grace this rapidly developing royal park.

Our lack of fine sculptural groups is a slur upon our national prestige. When considering a grant for this purpose the execution is delayed indefinitely and just about the meanest site available placed at the disposal of the sculptor with which to "improve," a herculean task with no great thanks attached to it. For years it has been considered wanton waste to allow a greater area than, say, 100 square feet for the monument of an equestrian group, and little assistance is afforded in the treatment of its environment. If our sculptors were encouraged to produce good work by giving them greater scope we should not find the "horses backing off their pedestals," which is an American opinion of some of our much-honoured statues.

Although the alterations at the Marble Arch have temporarily solved a traffic problem, it cannot be said to be an architectural triumph. The arch itself has seen many vicissitudes, and its last state would appear to be worse than the first, but the gunmetal gates still hold their own against their new rivals.

The requisite width of main roads has been the subject of much controversy and very diverse opinions have been expressed. Whereas Wren stipulated three distinct widths, viz., 90 feet, 60 feet, and 30 feet, the Royal Traffic Commission recently fixed the main arteries at a size calculated to take a double row of tramway lines, 140 feet, to which Mr. Waterhouse objected as being too wide. It is a question, where trams occur, whether the road should not be wider, the rails being confined to the centre of three courses, as illustrated for a road of 220 feet, crossing a road of 140 feet, house-to-house. By this means the traffic would have an up and down route, separated from the trams by a narrow strip of pavement, with electric lamp standards, trees, entrances to underground conveniences, and cab-stands at intervals. Where trams are not

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to motor

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to all
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have a
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ORIERS.*

present day can, by
, regulate the kind and
regulate as far as practical needs,
practical needs,
excess of these useful

situated. Driers
consist either of com-
much than not con-
often when used for certain
consist of lead, man-
in turpentine or white
is often present in con-
useful under certain con-

varnishes hardened by
found extensive application,
surface and last fairly
days' exposure destroys
external atmospheric con-
which is converted into lime)
factor in dried oil films, and con-
used in a paint or varnish which

the factors governing the drying of
attempt to show that driers to be used
be varied according to the conditions exist-
For this reason the painter of the
necessary) will buy his lead and
and demand a guarantee as to
of soluble metals present. Materials of this
driers separately, and demand a guarantee as to
are then necessary. Materials of this
more useful than the nondescript articles
are often now supplied.

All authorities agree that after the addition of a certain quantity of driers to linseed oil no improvement can be effected in the drying power. On the other hand there is no evidence to prove that excess of driers has the contrary effect. I believe that the presence of some metals, e.g., lead, tends to harden a varnish film, and when durability against external atmospheric action is not in question the presence of the metallic salt may be an advantage.

A German chemist has made use of this property in the preparation of a flatting varnish. He found that a varnish containing a requisite amount of lead drier was not hard enough to withstand rubbing down, but when agitated in the air with a mixture of litharge and zinc sulphate (white copperas) he obtained a product which was extremely satisfactory.

More than 15.2 per cent. of manganese should never be present in an oil, and for lead the limit of drying power is attained when 1.16 per cent. is present. It is not always necessary to employ the maximum quantities after consideration of the conditions; the less the better. Manganese and lead working in conjunction are more rapid driers than when used separately. If used in the ratio of 5 to 1 not more than 6 per cent. of the metal should ever be present, *i.e.*, 5 per cent. lead and 1 per cent. manganese. Other metals are less energetic than those mentioned, but I have found that .032 per cent. lead and .032 per cent. manganese will produce a small proportion of oxygen absorbed by the oil, and the presence of lead .77 per cent. will double the amount of oxygen absorbed and quality of the oil prepared from it. Linseed oil prepared from impure oil deposits certain impurities which are separated by the action of observers consists mainly of lead and manganese salts of the phates, while others consist of lead and manganese salts of the affect the drying power when allowed to remain in contact with duced by ageing are entirely removed by filtration.

Oils containing a lead drier have a maximum drying power when allowed to remain in contact with the oil for a tionship to the acid radicle of the drier. Thus the presence of the preparation of the oil, and the time of contact is greatly influenced by the nature of the acid radicle of the present. This salt may be precipitated by the addition tion has no connection with the drying power of the oil (as panied by a flocculent deposit. Oxygen plays a very important not essential. Oxygen does not exert its full influence when air is excluded the drying power is greatly reduced.

Manganese oils do not deposit any flocculent matter. ployed in the preparation of the oil, and the temperature to alter the drying properties of the oil. Thus oils prepared ent results have been obtained by different manufacturers. my opinion, the varying character of the results obtained accounts for these discrepancies. The temperature at drying oils, which interests us principally, is a very that I think it inadvisable to give any temperature at mental evidence. Only by the application of the observed facts can the riddles connected with the drying for some time linseed oil undergoes a change, A varnish prepared in this way will dry in one prepared, so far as is practicable, at a lower temperature.

The so-called "bunghole oils," that is, pared at ordinary temperatures, depend on according to some authorities the elasticity inferior to those of an oil prepared at 100° that lead manganese "bunghole oils" an increase power less if heated to 180°C. An increase ture considerably accelerates the drying process oil which in winter at normal room temperature in summer to seven days to dry, dries off in summer in days, while at 50°C. the process is complete in

Light is a very important factor when considered. Oils are bleached by the action of made an important observation in this direction, that the presence of oxygen was also necessary; closed bottles when exposed, underwent no change, common knowledge that paints and varnishes dry much rapidly when exposed to the light than when in the Chevreul was, I believe, one of the first observers to mine which kind of light accelerated the drying process. exposed under white glass dried first, while that exposed under red glass which cuts off all light of short wave length, dried least. Natural light varies so much in quality and quantity that it is too irregular a source with which to conduct exact experiments and in addition there is a liability of heat rays vitiating the results.

Genthe found a uniform source of light without heat in the mercury lamp. It is known that this source is rich in light of short wave length. When the lamp is enclosed in glass these rays are cut off, but if quartz glass is used this difficulty is overcome. This is the so-called Uviol lamp. Experiments proved that under the influence of this light raw oil and oil containing driers dried practically at the same rate. In the first part of the lecture I explained that the ultimate factor in the formation of the oil film was a peroxide produced in the oil itself. If this is correct and the Uviol lamp is able to make raw linseed oil dry at the same rate as oil containing drier, then the rays from the lamp must have the property of directly producing in linseed oil that efficient peroxide which in the presence of oxygen is capable of producing the solid oxidation product.

This discovery appears to me of such far-reaching importance that it may be of interest to give a short account of the patent which has been taken out for producing drying oils by this process on a commercial scale.

This method has the object of producing from linseed oil, &c., drying oils which have not the defects of oils

* Abstract of a paper read before the Paint and Varnish Society by M. B. Blackler.

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obtained by other methods. The autocatalytic agent formed during the natural drying process is produced by artificial means. Under the influence of light of short wave length produced by Uviol lamps, air is pumped through linseed oil and in this way typical peroxides are produced. These are the catalytic agents which accelerate the drying process, whereas all other driers only accelerate the production of these autocatalytic agents.

The drying oils obtained by this method have particularly valuable properties. When applied the oil dries rapidly and instead of forming a skin a complete solidification takes place, giving a brilliant non-sticky coating which resembles varnish in appearance. This glowing description may be somewhat too laudatory, but nevertheless I think that a distinct advance has been made by the discovery of this process.

The operation is carried out as follows:—

A vat illuminated with twenty Uviol lamps, is charged with 1,000 kilos of oil warmed to 80°C. Oxygen in a finely divided condition is then passed through the oil—the energy of the reaction is sufficient to keep up the temperature without the application of external heat.

It is so well known that all painting should be carried out in a dry atmosphere that the effect of moisture may be considered as outside the pale of consideration. Unfortunately ideal conditions cannot always be chosen, so it may be well to inquire whether all driers are affected by moisture in a similar degree.

Tanked linseed oil, raw linseed oil and hemp oil, all dry much more slowly in a moist atmosphere than when the air is dry.

Oils containing a mixed manganese lead drier certainly dry more rapidly in a dry atmosphere, but the retarding action of moisture is not very pronounced.

Manganese alone offers the most curious study. When comparatively large quantities of this metal are present in an oil, i.e., .1 to .2 per cent. moisture may be said to practically prevent oxidation. This point is well illustrated by the following result due to Lippert:—

Manganese Boiled Oil ·2 per Cent. Manganese (Lippert).

Date.	Time.	Weather Conditions.	Temp.	Weight of Film and Oxygen Absorption. Dry Air.	Moist Air.
Put in Nov. 22.	5 p.m.	Bright	9°	367 m.g.	449 m.g.
Put in Nov. 23.	4 p.m.	Bright	14°	+58=15·8%	+5 (dry) 1·1% (wet)

On the other hand when the quantity of manganese is gradually decreased the drying power gradually increases in the moist atmosphere and decreases in the dry atmosphere. With .02 per cent. of manganese Lippert obtained results as follows:—

Manganese Boiled Oil ·02 per Cent. Manganese (Lippert).

Date.	Time.	Weather Conditions.	Temp.	Weight of Film and Oxygen Absorption. Dry Air.	Moist Air.
Put in Nov. 30.	12	Bright	15°	388	310
After 5 hours .	5	Bright	15°	+3=0·8%	+8=2·6%
After 24 hours .	12	Bright	15°	+29=7·5%	+40=13%
After 47 hours	11	Bright	15°	+51=13·2% (sticky)	+50=16·1% (dry)

The introduction of a very small quantity of manganese into raw oil makes it at once capable of drying more rapidly in a damp atmosphere than in dry air.

Complicated theories and scientific data are useless for commercial purposes unless results for the practical man can be derived from them. I will now put forward a suggestion which I think can be deduced from the facts which I have already placed before you. It is probable that many gentlemen present will neither agree with these opinions nor with those already expressed, but this will invite discussion, and after all, interchange of ideas and opinions is the main object of the society. The drying of linseed oil can only be accelerated by the addition of the metals manganese and lead, or the two combined. So-called colourless liquid driers composed chiefly of calcium resinate with small amounts of lead salts are in the majority of cases useless as driers, particularly when they are added to paint for outside work. There is a certain quantity of drier which can be used with advantage. When using pure lead drier the maximum quantity of metal is 1.6 per cent. of the oil present, whereas when manganese is used alone, not more than .15 per cent. of metal should be employed.

For general work a mixed drier is most satisfactory—e.g., .23 per cent. of lead and .046 per cent. manganese oxide gives good results.

In summer time, when the general weather conditions are good, very much less drier can be effectively used.

For outside work in dry weather a pure manganese drier (notresinate) should find application, whereas in damp weather this should be replaced by a manganese lead mixture.

Although much has been written on the subject of driers and drying oils the literature as yet contains no reliable information concerning the correlation between the durability of the oil film and the amount and kind of drier employed. I know that some of our members are interested in the microscopy of the subject. Here is a field of research which offers work for all. Unfortunately a few experiments are useless when dealing with a subject of this nature. The oil, the drier and the conditions of exposure must be definitely characterised if the results are to be at all useful.

In common justice to those concerned it is necessary to state that when preparing this paper I consulted practically all the original papers published in the English and German literature during the last fifteen years, as well as the more important literature on the subject. My thanks are, therefore, due to Andés, Fahrion, Lippert, Mulder, Livache, Weger and many other gentlemen who have contributed to the literature of drying oils and driers.

CONCRETE SCHOOL BUILDING FOR DUARTE LOS ANGELES, CALIFORNIA.

IT is a satisfactory sign of the progress of the times that the general public, and more especially the official public, is waking up to the appreciation of first-class work, permanent in character and attractive in design, and demanding from the engineer and architect structures that will in all respects fill the call for more substantial and permanent types of construction.

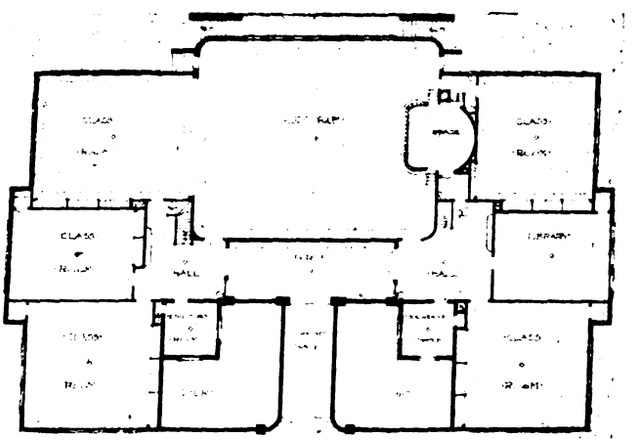
There is no class of structure that calls for attention on artistic lines and careful consideration of accommodation and sanitation more than that of school buildings.

Concrete construction undoubtedly furnishes the substantial requisite, and lends itself very readily to the artistic conception of the architect. The erection of a school building at Duarte, California, is now being completed, and has some interesting features in arrangement.

The building is a one-storey and basement school-building of the Spanish mission type, and has a picturesque effect, with its open court in front, wide entrances, towers, and projecting eaves.

The building is of reinforced concrete construction, the mixture being of one part Portland cement to six parts of good clean Arroyo gravel, machine mixed.

The vertical reinforcement consists of ½-inch square steel, 12 inches on centres in walls, and four bars in each mullion.



PLAN OF SCHOOL BUILDING, DUARTE, LOS ANGEL ES.

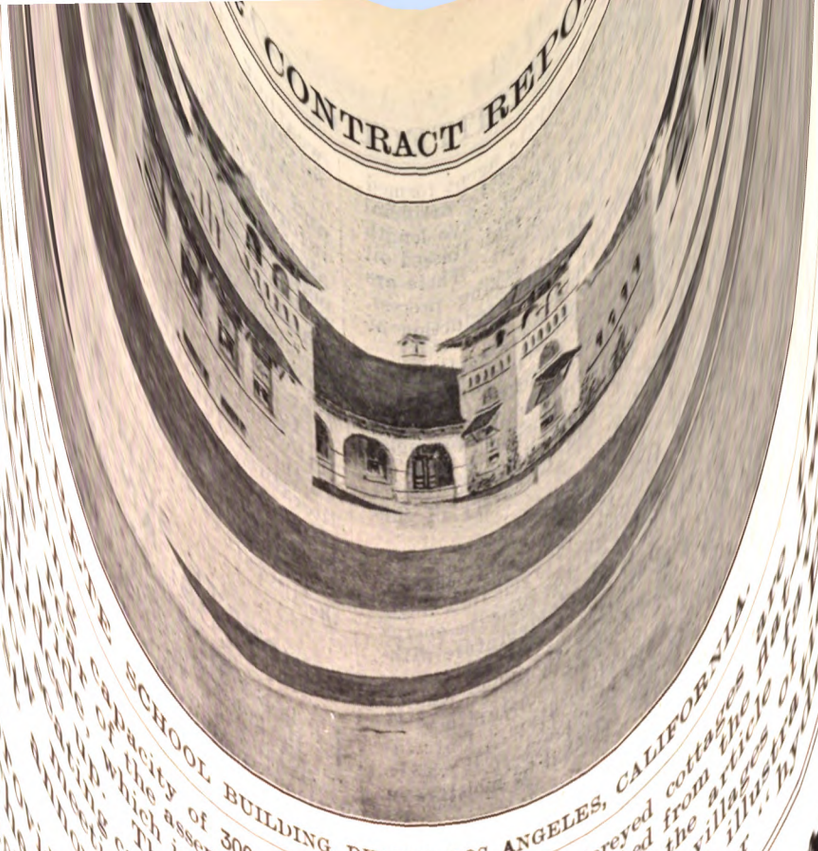
The horizontal reinforcement consists of ½-inch square twisted steel, 12 inches on centres, with ends lapped 20 inches, and with an additional reinforcement of ¾-inch twisted bars under and over all openings and around in top of the walls. The exterior is plastered with one part of cement to two parts of sharp sand, put on with an even brush dash.

The roof is covered with tinned and galvanised iron Spanish tile. The galvanising was done after bending the tile into shape.

The exterior walls are painted with two coats of cold-water paint in a rich cream colour. The window-frames, rafter-ends and all trimmings are painted in clear white. The roof is painted in a warm burnt-clay tile colour.

The building contains (see plan) on the main floor four large and one small class rooms, large library, office, and teachers' rest-room, and also a large assembly hall with the

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SCHOOL BUILDING, DUARTE, LOS ANGELES, CALIFORNIA.

capacity of 300, and two
the assembly hall there
which is hung on pulleys
This opens to a large
capacity of the assembly
The door is well
noise in the ad-
with wardrobes instead of
rooms have large panels and are
blackboards on the fronts.
and counterbalanced. The
with grating in the bottom of
of each apartment, the exhaust
passing through each apartment,
the toilet, furnace, and fuel rooms.
and ventilated by the warm air blast
driven by electric motor.
was designed and planned by Architect
Monrovia, California, the contract price
of $ 307 South Broadway, Los Angeles, California,
was erected under his supervision. It is one of the most
and best arranged school buildings in any town in
tion of the State, and reflects the interest shown by
citizens in providing good educational facilities.

One family two-storeyed cottages are
tempted as distinguished from the villa type of
house. In the course of the article allusion is
made to the English model village of Port
Sunlight. A description with illustrations
of a new bathing establishment or "lido" at

Correspondence

[The Editor will not be responsible for opinions expressed by Correspondents.]

Berkshire County Council Offices.

SIR,—We note in your criticism of the above Mr. Mould's name is alone mentioned in connection with the plans prepared by him in conjunction with Charles D. James. We might also call your attention to the fact that the cubing price allowed by us for all the main fronts was 10*d.* per cubic foot, and not 4*d.* Fourpence was allowed for the new large hall, suggesting ferro-concrete for the constructive material, the plan being so arranged that its side elevation is not seen in conjunction with the elevations facing the town hall square. We are bound to admit that the price allowed by the conditions of the competition was small, but we consider that we could have carried out the building for the price allowed by the use of the materials we suggested, especially as we expected to make a big score by the fact that we have saved the present building practically intact, which apparently the successful scheme has not attempted to do.—Yours faithfully,

STUART M. MOULD,
CHAS. D. JAMES, } Joint Architects.

ment upon the fact that the authors of the above
first have not adhered to the conditions governing
the private road. You do not, however, appear to
a very serious matter.

We therefore beg to inform you that Messrs. Sutton
the right to build on the front and back portions of this
and moreover from information given us there is a probability
of their ultimately doing so.

In addition to question 38 referred to by you, question
36 bears upon this matter. We quote below the question to
which the answer was "No."

"36. Is the County Council to have 'a right of way'
over the land between building lines?"—Yours faithfully,

NORTH & ROBIN.

203 Strand, W.C.: September 16, 1909.

[We pointed out in our review that although the Council have no "right" to use of the private road, they may possibly be permitted the user by courtesy.—ED.]

Grimsby Town Hall Competition.

SIR,—We note in your review of the above Mr. Mould's name is alone mentioned in connection with the plans prepared by him in conjunction with Charles D. James. We might also call your attention to the fact that the cubing price allowed by us for all the main fronts was 10*d.* per cubic foot, and not 4*d.* Fourpence was allowed for the new large hall, suggesting ferro-concrete for the constructive material, the plan being so arranged that its side elevation is not seen in conjunction with the elevations facing the town hall square. We are bound to admit that the price allowed by the conditions of the competition was small, but we consider that we could have carried out the building for the price allowed by the use of the materials we suggested, especially as we expected to make a big score by the fact that we have saved the present building practically intact, which apparently the successful scheme has not attempted to do.—Yours faithfully,

STUART M. MOULD,
CHAS. D. JAMES, } Joint Architects.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* treats us to some illustrations of garden architecture in the shape of Mr. G. W. Wattles's garden at Hollywood, California, and some picturesque bits entitled "Glimpses of Rural England," which include some of Mr. Lutyens's work and Mr. Thackeray Turner's home.

Deutsche Bauzeitung illustrates a new paper-mill at Waldhof, near Mannheim; the Victoria and Albert Museum, Imperial Institute and Natural History Museum, and gives an account of our group of national museums at South Kensington.

La Construction Moderne celebrates the respite from destruction of an eighteenth century house in the Rue de l'Université, Paris, by giving an illustration of some of its carved and sculptured detail, which is of quite excellent quality.

Dekorative Kunst describes and illustrates three country houses by Hermann Muthesius, one in Zehlendorf-West, one in Lübeck, and one in Grunewald, all of which, though thoroughly modern German, show that Herr Muthesius has not studied English domestic architecture for nothing. There are also illustrated some very charming examples of modern jewellery, the work of Paul Haustein.

Der Profanbau gives an illustrated account of the municipal housing scheme of the city of Ulm, which has covered an estate quite picturesquely with houses for its workmen and other employés of what is called the lower middle-class.

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The Architect.

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FORTHCOMING EVENTS.

Monday, October 4.

Royal Academy: Course of six Lectures on "Chemistry" by Professor A. H. Church, D.Sc., M.A., F.R.S., opens. Subject: "Paper, Canvas, Panel, and other grounds."

Society of Engineers: Meeting in Room 18 Caxton Hall, Westminster. Paper on "The Status of the Engineering Profession," by Mr. G. Allan Thomas.

Tuesday, October 5.

Institution of Heating and Ventilating Engineers: Meeting at the Institution of Mechanical Engineers, Storey's Gate, S.W. Papers on "Heating of a Hospital," by Mr. F. B. Craig, and "A Few Thoughts on Fans," by Mr. Oswald Stott.

University Extension Guild: A course of twenty-four weekly lectures on "Ancient Architecture" opens at the British Museum, by Mr. Banister Fletcher, F.R.I.B.A.

Wednesday, October 6.

Royal Society of Antiquaries of Ireland: Excursion to St. Doulough's, Malahide and Swords, County Dublin.

Thursday, October 7.

Civil and Mechanical Engineers' Society: Meeting at Caxton Hall, Westminster. Presidential address by Mr. W. Noble Twelvetrees.

Friday, October 8.

Architectural Association: Annual General Meeting. President's address and distribution of prizes.

TOWN PLANNING IN PRACTICE.

IT is easy enough to sit down with a map of some city or town before one and to imagine new streets that will possibly have some advantage over the existing arrangement, but this is a very different thing to planning a town so that all the considerations that should be taken into account are properly and most beneficially brought under review and their relative importance given due weight. Some idea of the multitude of these considerations may be obtained from a perusal of Mr. RAYMOND UNWIN'S book on "Town Planning in Practice." *

To begin with, the ambitious novice in town planning should study what has been done in the past. He will learn that town planning on a definite system was practised so long ago as 3,000 B.C. in the laying out of the ancient town of Kahun, built to accommodate the workmen engaged in the building of the pryamid of Illahun. This is the earliest at present known example of a town laid out on a regular plan, and follows the rectangular arrangement of blocks characteristic afterwards of Ionian, of Greek, of Roman and of American town-planning.

Such an arrangement one can readily understand as being especially suitable to the housing of a large number of workmen strictly organised under a quasi-military discipline and divided into companies and sections. Thus it was adopted in the Roman prætorian camp, and following this precedent in the Roman town. The system of land tenure prevailing in the city of Rome itself, where the ground was divided into insulæ, each of single ownership, was admirably suited by the rectangular block arrangement of streets and lanes. For financial reasons such a system of cutting up the site of a city is admirable, and where, as in New York, the land for occupation is limited by natural boundaries it is almost imperative. There are no acute angles nor curved lines to waste an inch of ground in sites of awkward shape.

On the other hand, the rectangular block arrangement does not make for convenient access from point to point, but will most usually demand the travelling round two sides of a triangle instead of one. Little wonder then that in America they are coming to realise the advantage of diagonal thoroughfares across the rectangular blocks and directly connecting the vital points of the city's life, as in Philadelphia and Washington.

Kahun may be taken as the prototype of the formal school of town planning, and as the ancestor not only of the strictly rectangular block disposition, but of the grand manner of the Renaissance period. In this the monotony and the restricted perspective of the American type are relieved by the provision of open squares, of avenues, of grand and wide approaches to some important and stately building.

Next we have the radial type of plan, of which Karlsruhe is so striking an example, a type suited to a town which has but one centre on which all interest is focussed, a town in which one distinctive feature dominates the whole. One cannot but admire as a clever combination of these types Sir CHRISTOPHER WREN'S plan for the rebuilding of London. For scenic effect, for convenience of traffic, for emphasis of the vital centres, it would be difficult to find a plan more suitable for the London of the seventeenth century than was WREN'S, and even for our own time how far preferable it would be to our overgrown lines of the mediæval town.

The mediæval town as a general rule is the precise antithesis of the formal or Kahun type. It appears to have grown up haphazard almost, or at least regulated only by natural considerations of contour and of environment, more often than not enforced by the particular disposition of fortification which these required in each instance. But as Mr. UNWIN points out, the modern German school of town-planners is disposed to argue that what appears to us at first sight the haphazard result of accidental growth has been in reality deliberately designed under the influence of artistic impulse felt, if not clearly recognised.

Therefore, say the Germans, we should endeavour consciously to reproduce the devious lines and varying width of streets, the closed vistas produced by the breaking off from directness of thoroughfare that are so characteristic of mediæval towns. A town plan by a modern German architect, such as that of Kufstein by Herr OTTO LASNE, looks very rambling and confused compared with the regular gridiron of an American city; but in studying a town plan one must above all things picture it at the street level, and not from a birdseye view as one sees it on a map or drawing.

Thus we have two distinct schools of town planners as of garden designers, the formalists and the informalists, and Mr. UNWIN devotes a chapter to a critical consideration of formal and informal beauty, the varied claims of which he very fairly discusses without dogmatism and with due recognition of the principle that each individual problem has its most appropriate solution.

A highly important chapter to the student of town planning is that "Of the City Survey." In this the author gives an indication of the many data that are required before the plan of a town can be commenced—the lines of traffic and their relative importance, the prevalent winds and their intensity, the rainfall, the nature and requirements of present and future industries, the social aspects of the life of the future inhabitants, the natural beauties of the locality—all these and many other points must be investigated and taken into account.

* *Town Planning in Practice: An Introduction to the Art of Designing Cities and Suburbs.* By Raymond Unwin. (London: T. Fisher Unwin. 21*s.* net.)

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Should the town-designer's predilection be for the mediæval type of plan rather than the formal, he should not forget that in very many instances one of the vital elements in determining its lay-out was the disposition of its fortifications and the influence thereof on the character of its boundaries and approaches. Nowadays we have no fortifications to limit or to guide us, and it would be pure affectation, not to say, crass disregard of the nature of our modern problems, to follow too closely on the mediæval pattern made under widely differing conditions. Take Rothenburg-on-the-Tauber, for example, that marvellously picturesque Bavarian town that, if not altered since we were there some years ago, still preserves its walls as they were left at the close of the Thirty Years' War. Its picturesqueness, as shown by numerous photographs in Mr. Unwin's book, we must all admire, but it does not necessarily follow that we should copy in every instance, or necessarily in any instance, its disposition of streets and thoroughfares.

"Centres and Enclosed Places" and "The Arrangement of Main Roads" are two vitally important sections of the question of a town plan to which Mr. Unwin has devoted very careful attention, and which he explains with much lucidity. The difference between the Parisian and the modern German quasi-mediæval methods of planning are in no branch of the subject more pronounced than in these matters, and the relative advantages of the two schools must be thoroughly understood and their application to particular instances carefully thought out.

"Site Planning and Residential Roads" require in addition to well-planned vistas, whether closed, as Mr. Unwin, we fancy, seems to prefer, or open, a very careful attention to aspect, one of the most important factors in the production of healthy and comfortable residences.

The general considerations of the massing of towns must be followed in their planning in practice by those of "Plots and the Placing of Buildings" and of "Co-operation in Site Planning," and on these points apt illustration of the advantages to be gained is afforded by the examples given us by Letchworth and Hampstead Garden Suburb, in which such excellent results have been achieved by Mr. Unwin and other architects associated in their production.

The final chapter of the book before us treats of "Building By-laws" and their generally unsatisfactory influence from the point of view of architectural design and beauty, and the author points out how with less arbitrary rules and regulations not only would the æsthetic requirements of town planning be better compassed, but the hygienic aspect would be more largely promoted.

We cannot altogether agree with the preface, in which our author modestly urges that he has only been able "to deal in an introductory and imperfect manner with the different points raised." Introductory the work may be, for in England the subject of town planning as a form of art is but in its infancy; but we consider that Mr. Unwin's work is an admirable and perfect introduction to his theme, containing most useful lessons and suggestions and adequately dealing with the many and complex problems that the new art of town planning involves.

NOTES AND COMMENTS.

We are naturally pleased, as no doubt all of our readers will be, that the Chancellor of the Exchequer on Tuesday last conceded the exemption from the tax on minerals of clay, sand, gravel, chalk, and limestone, recognising the very serious influence that such a tax would have on the British industries of brick and tile-making and of Portland cement manufacture. We venture to take some credit to ourselves and our contemporaries in the technical Press for the concession as the result, at least in part, of the arguments that have appeared in our columns and have been brought to the notice of those members of the House of Commons whose constituencies are especially interested in the industries affected.

A museum is essentially more than a mere storehouse of curios or even valuable objects. It is an educational institution, and everything therefore that makes a museum more useful to those who wish to learn enhances the value of the institution and of the benefit to the public that justifies its existence. The British Museum has for some time past been used for object-lessons by visiting bodies of students from various institutions and organisations, and lectures or expositions have been given by members of the staff or by leaders of the visiting students. Under the auspices of the University Extension Guild, and by permission of the trustees, a new departure is next week to be initiated in the shape of a series of lectures, illustrated by lantern slides.

The subject of these lectures is to be "Ancient Architecture," and they will deal with Egyptian, Assyrian, Persian, Greek, Roman, Early Christian, and Byzantine architecture, and will be delivered by Mr. Banister F. Fletcher, F.R.I.B.A., commencing on Tuesday next at 4.30 p.m. The course will comprise twenty-four lectures, and since the object of University Extension is rather general culture than technical training, they will be arranged for the benefit of art students and the general public rather than of architects solely. The reason for such lectures being given at the British Museum rather than at some other centre is, of course, that there, surrounding the students, are the concrete illustrations, far superior to lantern slides, of the subject of the instruction given. We understand that full particulars and prospectus can be obtained from Miss Gaudet, Hon. Secretary to the Course, at 120 Cheyne Walk, Chelsea.

The programme for the sessional meetings of the Royal Institute of British Architects for 1909-10 commences with the President's opening address on November 1, and includes papers on "The Planning and Laying Out of Public Places," by H. Inigo Triggs; "Architectural Education in America," by A. D. F. Hamlin, A.M. (Columbia University); "Carr of York," by S. D. Kitson, M.A.; "George Frederick Bodley," by Edward Warren, F.S.A.; "The Business Side of Architecture," by A. A. Hudson, Barrister-at-Law; "Architecture of the Balkan States," by George Hubbard, F.S.A.

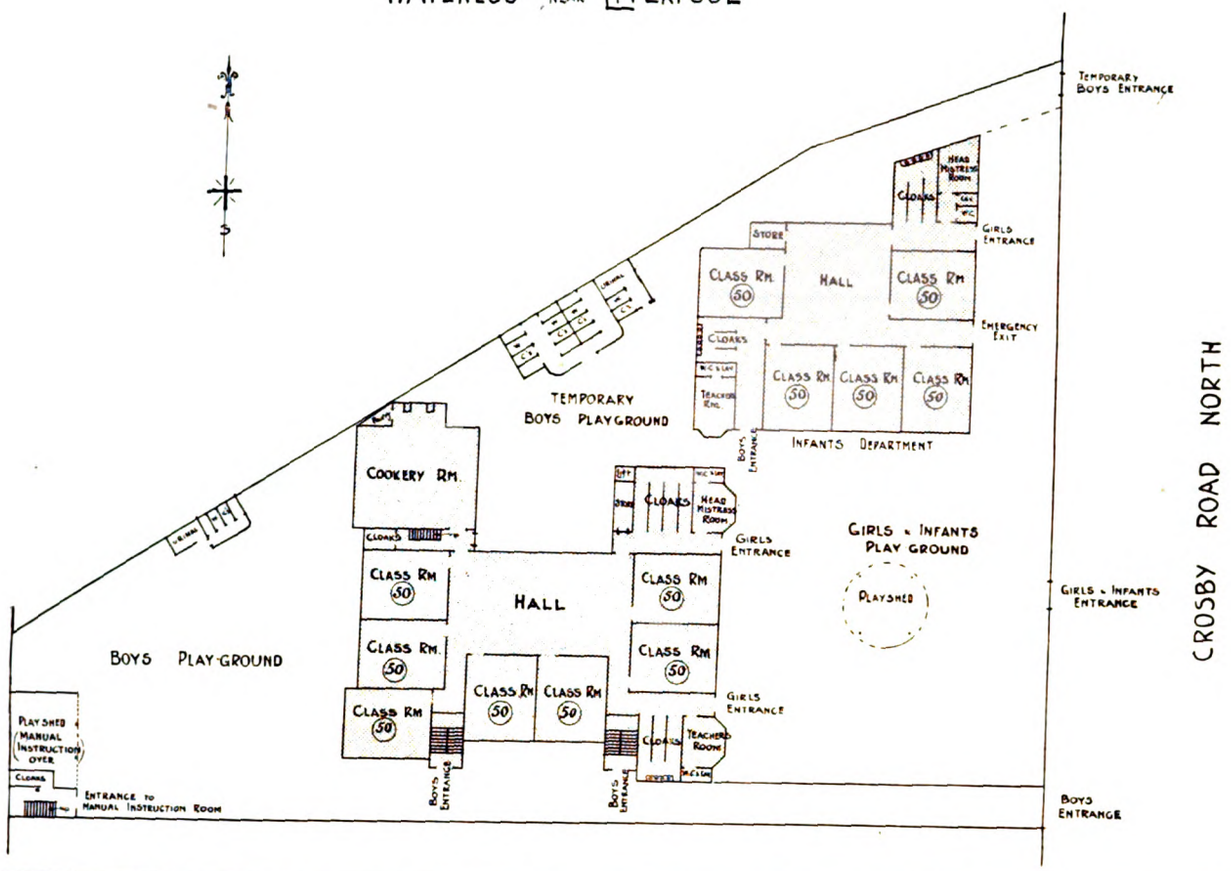
Great satisfaction has been expressed at the discovery by Mr. Sydney Perks, the City Surveyor, of the two fifteenth-century windows at the London Guildhall, which we described and illustrated last week, and further investigations are to be made in the hope of additional finds. Mr. Perks seems to have the true archæological instinct, and if there is anything more to be brought to light we may trust him to make a fruitful quest.

The Bishop of Carlisle hit the right nail on the head when he stated his view at the Diocesan Conference during the discussion on the question of ecclesiastical dilapidations, that when a glebe house was once placed in good tenantable repair a few pounds spent every year would keep it in order. The same policy should be applied by the clergy to the cathedrals and churches under their charge, then restoration would be unnecessary, and sustentation would always keep the fabric in good order at far less expense. Dilapidation and decay have a way of increasing at compound interest, not to say geometrical ratio.

There is a great deal to be said in favour of the scheme laid before the Conference for allotting to the Ecclesiastical Commissioners, and the Queen Anne's Bounty Office the duty of undertaking the entire charge of repairs to glebe property, subject to a compulsory fixed charge on the incumbents of about 2½ per cent. on the net income of their livings. The official body would then become a kind of insurance office and relieve the clergy of the disagreeable necessity of finding lump sums of considerable amount at somewhat uncertain and therefore inconvenient seasons. Whether the Ecclesiastical Commissioners, with their extensive experience of house property, would deem the 2½ per cent. a sufficient premium for the insurance is quite another matter.

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PROPOSED ELEMENTARY SCHOOLS
WATERLOO NEAR LIVERPOOL



COMPETITION DESIGNS FOR SCHOOLS AT WATERLOO AND SEAFORTH, LIVERPOOL.

IN May 1908 the Urban District Council of Waterloo-with-Seaforth invited competitive designs for schools at Waterloo and Seaforth, and have recently made known the result.

The successful competitors for both schools are Messrs. Appleyard & Quiggin, A.R.I.B.A., of Lord Street, Liverpool. Seventeen sets of designs were submitted for the Crosby Road North school, Waterloo, and sixteen sets for the Rawson Road school, Crosby.

Crosby Road North School, Waterloo.

This school was intended to accommodate 1,000 scholars in three departments—viz., 350 boys, 350 girls, and 300 infants, in separate departments. It also had to be designed so as to be erected in sections, the first portion to be a department for 350 mixed and infants, with a cookery room.

It is proposed to build the ground floor of the mixed department in the first instance with a flat roof, and running the parapet walls to sill height of the first floor.

We notice that the infants' department only provides for 250 scholars.

The emergency exit in the infants' department does not appear necessary, as the entrances are so placed that easy exit can be made in case of emergency. No doubt the authors provided this exit in accordance with the conditions.

The general arrangement of the scheme appears satisfactory, and though the boys' staircases have no communication with the ground floor in the mixed department, yet access from the ground and the first floor can be obtained by means of the staircase in the cookery and science section.

Rawson Road School.

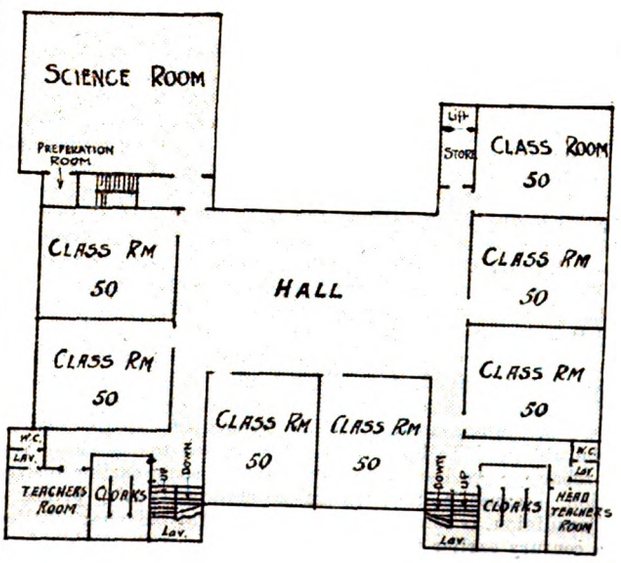
The school when completed is to contain 400 in the mixed department and 200 infants, together with a special subjects' department with mistress house attached.

In the first instance it is proposed to erect a department for 350 infants and children of both sexes and the special subjects' department.

The conditions of the competition required emergency exits to be provided. The emergency exit in the infants' department is not required, and the space could well have been adapted for a store.

The position of the cloak rooms does not appear to be very satisfactory, as the scholars must of necessity have to retrace their steps either entering or leaving the school. Otherwise the scheme is satisfactory.

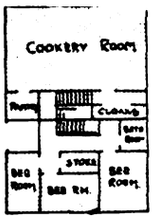
CROSBY ROAD NORTH SCHOOLS, WATERLOO



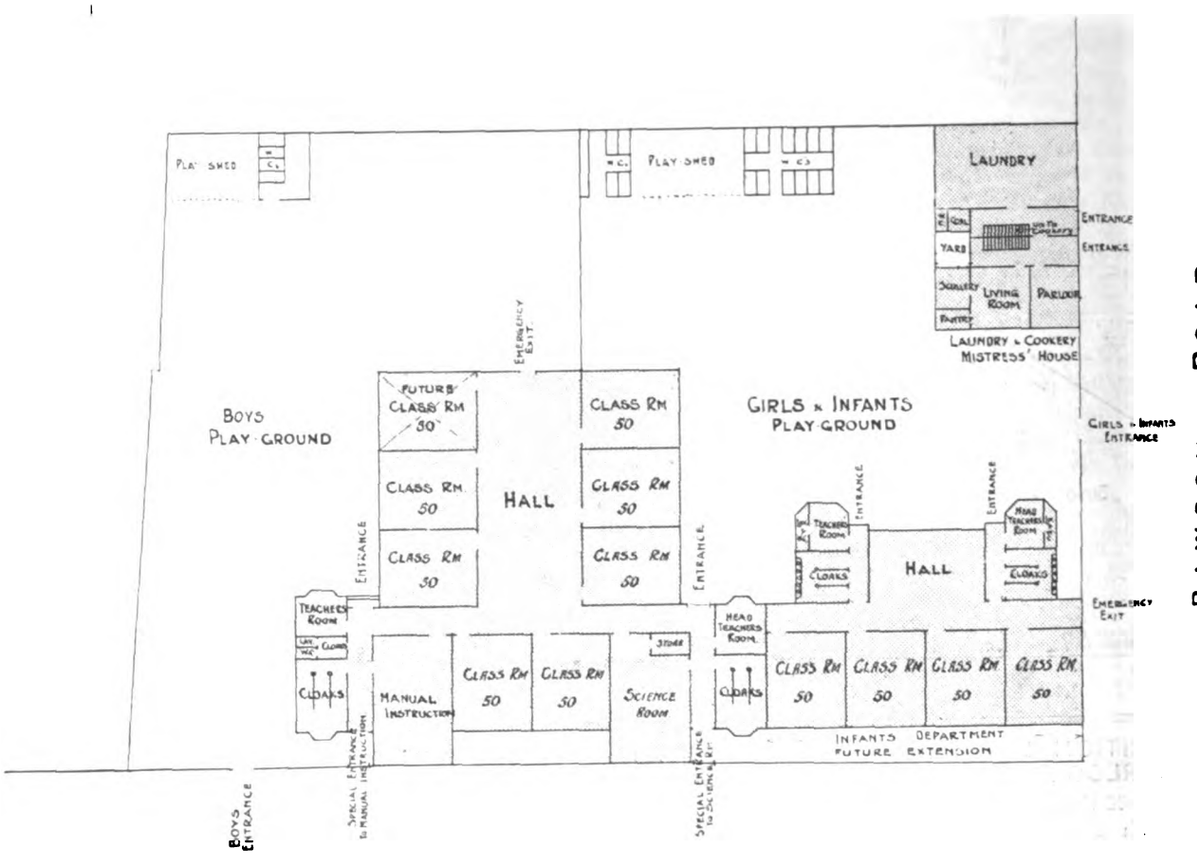
FIRST FLOOR PLAN

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Proposed Elementary Schools
Seaforth near Liverpool



First Floor Plan



TALLEY ABBEY, CARMARTHENSHIRE.

By Professor E. Tyrrell Green.

THE foundation of Talley Abbey is generally attributed to Rhys ap Gruffydd, Prince of South Wales, just before the close of the twelfth century. This was the same prince who founded the great Cistercian monastery of Strata Florida in Cardiganshire. The earliest evidence connecting him with Talley appears to be a charter of Edward III. which confirms certain possessions to the house, and refers to "Rhesius Magnus" as the first donor. It is thought that, of those who bore the name of Rhys, Rhys ap Gruffydd best deserves the surname "Magnus." It is clear that the abbey was well established by the early years of the thirteenth century, because about 1214 Gervase, abbot of Talley, became Bishop of St. Davids.

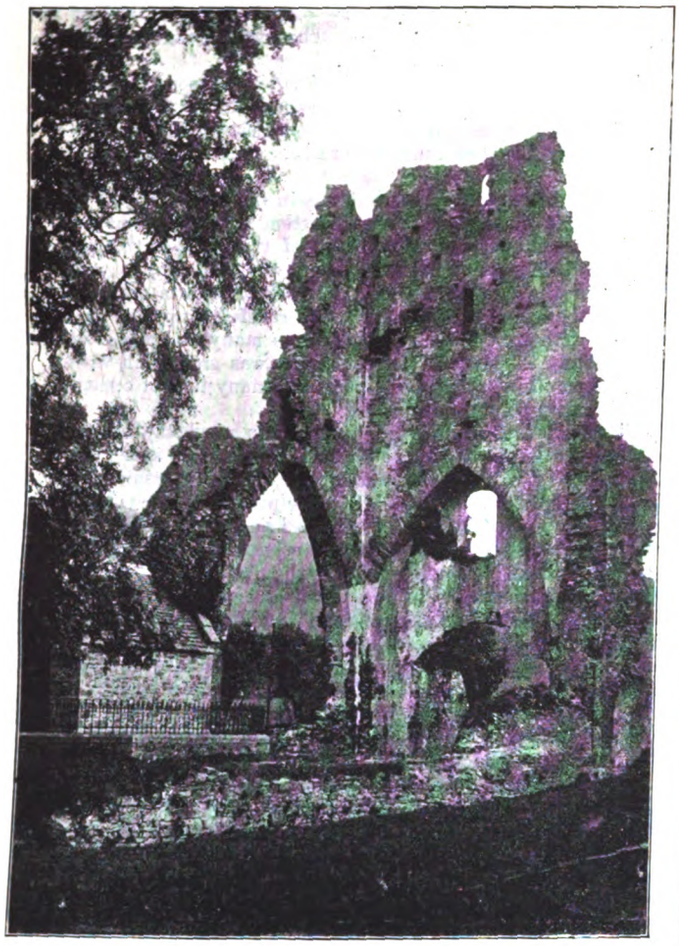
It is known that Strata Florida was a refoundation by Rhys ap Gruffydd of an older house. About two miles to the south of the ruins of the Cistercian monastery may still be seen the remains of the Hen Fynachlog. In like manner the abbey of Talley, whose ruins we see to-day, may very probably have been a refoundation of some earlier institution, because a daughter of Gwaethcoed-Vawr, prince of Caradigion, is referred to as abbess of Tal-y-llychan (Talley) a century earlier than the date of Rhys ap Gruffydd's foundation.

In the twelfth century the Benedictine had for about five hundred years been the sole monastic rule in Europe, *i.e.* it was the generally accepted rule of life for the "religious" in the technical sense of the term—for those, whether priests or laymen, who wished to devote themselves to God's service in a life of voluntary poverty, chastity and obedience. The other chief rule of life up to the twelfth century was the Augustinian. This was intended for clergy engaged in the active work of their calling, and was named after the great Bishop of Hippo, who in his house had gathered clergy round him, and, forming a community, in the same sort of way in which the Community of the Resurrection has been formed in our own time, with them lived a disciplined life. It cannot be said that St. Augustine founded an Order, but he set an example of community life for the clergy which was widely followed, and those who adopted it were known as Augustinians. Thus it came about that canons of cathedrals (not of Benedictine foundation) and of collegiate churches lived under the Augustinian rule. In process of time, just as slackness and luxury crept into the Benedictine monasteries, so too the Augustinian canons became less fervent in their devotion and more worldly in their manner of life. The twelfth century, however, was a time of religious revival. It saw the rise of the great Cistercian Order, which was a reformation from within of the Benedictine—a stern attempt to recall it to its original strictness of life. The same period also witnessed a like attempt to reform the Augustinian rule. The reformed Augustinians were known as Premonstratensians, so called from their first house at Premontré, near Laon, in Northern France. To this Premonstratensian Order Talley Abbey seems to have belonged. The Order was introduced into England about 1146, but there were not at any time more than about thirty-six houses belonging to it in our own country, and Talley was the only abbey of the Order in Wales. That the Premonstratensians never became a very popular or wealthy community in this country may be due to two things: first, their houses were subject only to the Abbey of Premontré, the mother house of the order, and therefore were in this land something like foreign outposts, upon which the Britisher, with his characteristic insular prejudice,

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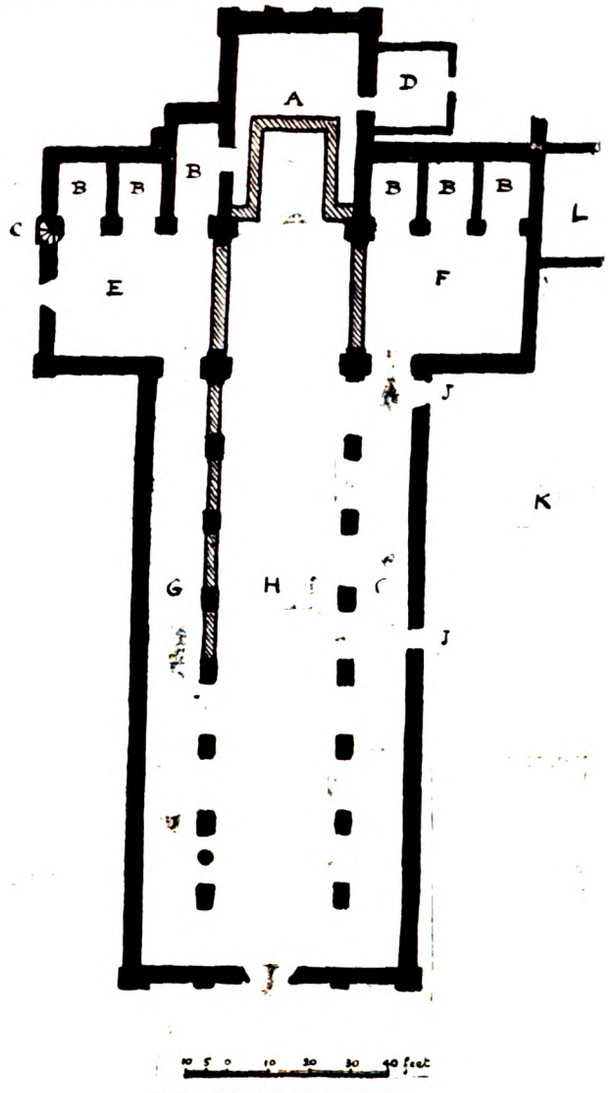
looked with suspicion; and, secondly, there arose amongst the Premonstratensians no commanding personality or great organising genius to do for the Order what St. Bernard did for the Cistercians.

To come to the buildings at Talley. The plan of the church is of the Cistercian type. In its rectangular and aisleless chancel and in its range of chapels on the east of the transept, it shows the peculiar features of a Cistercian abbey church, and almost exactly resembles Strata Florida Abbey in Cardiganshire. How shall we account for this if we are right in assigning Talley to the Premonstratensian Order? Giraldus Cambrensis tells of the ejection of Premonstratensian canons by the Cistercians in a certain place. The canons appealed to Hubert, Archbishop of Canterbury, and eventually regained their house. Now Hubert was Archbishop from 1193 to 1207, and the Premonstratensian canons referred to must be those of Talley, since there was no other house of the Order in Wales. It appears, therefore, that at the very time when this church was being erected there was a dispute for the possession of it between the two Orders, and for some time while the building was going on the house was in



RUINS OF THE CENTRAL TOWER, TALLEY ABBEY, CARMARTHENSHIRE.

the hands of the Cistercians. May not this account for the Cistercian ground plan of the abbey church at Talley? At the dissolution of the monasteries it was decided to use the abbey church for the parochial services, but as the whole church was much too large for the population and would prove too costly to maintain and keep in repair, walls were built within the church enclosing part of the choir and four bays of the nave, but excluding the transepts by blocking the north and south arches beneath the central tower. The rest of the building must speedily have fallen into decay, but the fragment around the central tower continued to be used as the parish church down to 1722, when even this was found to be too costly a building to maintain in sound condition. A new church was, therefore, erected to the north of the abbey, where, though since much altered, it still stands, and the stones of the abbey were used for the new building. As a ruin the great church lingered on, gradually getting less through being used as a quarry for structures in the neighbourhood or through natural decay. It was in 1845 that the last considerable fall of masonry took place. There is now so little left, save the shell of the central tower, that to attempt to reconstruct the church from the mutilated fragments might seem like setting out to reconstruct some prehistoric monster from a shattered bone, but from what we know of its history and through excavations conducted under the direction of Mr. Stephen Williams, F.R.I.B.A., of Rhayader, we are able to venture upon the task. The church was cruciform in plan and of great size—the nave alone was 145 feet long and had eight bays, one bay more than that at Strata Florida. There were six chapels to the east of the transept, three to the north of the central tower, and three to the south. A doorway gave access to the church in the north wall of the north transept, and near this may be seen the lower part of a spiral staircase leading to a passage which must have passed above the chapels of the north transept and thence to the belfry. This passage may still be traced in the remaining walls of the tower. In the south wall of the nave are traces of doors which must have led to the cloister. The domestic buildings at Talley were to the south of the church, as at Strata Florida; their site, however, has long been occupied by other buildings and has not been excavated, so that their outline cannot now be determined.



TALLEY ABBEY—PLAN.

We are told that in the excavations conducted here no carved stone-work of any kind was discovered. The building seems, therefore, to have been quite plain, the walls of rubble plastered over. When the church was built (*i.e.*, at the close of the twelfth and beginning of the thirteenth centuries) the prevailing style of architecture was the transition from the round-arched Romanesque to the early Pointed style, or perhaps the earliest form of Pointed which is generally known as Early English. Pointed arches were evidently used by the builders of Talley for construction—*i.e.*, where there was any great weight to be supported. Thus the arches at the base of the central tower are pointed; so, too, probably were the arches dividing the nave from the aisles. Some of the smaller openings, however, such as doorways and windows may very well have been round-headed, a conjecture supported by the fact that the small belfry-light still remaining in the east wall of the tower has a semicircular head. In the

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Transition period we often find the round arch thus retained for smaller openings, while the pointed form is used in the main structural arches of the building, as, *e.g.*, at Kirkstall Abbey (Yorks) and Buildwas Abbey (Salop). Talley Abbey was evidently an example of what may be called the Early Welsh Cathedral or Collegiate type, belonging to the same class as the still complete Early-Pointed churches of Brecon Priory and Llanbadarn-Vawr, and the later churches of the same general plan at St. Asaph Cathedral and Laugharne (Carmarthenshire). The typical feature of these churches is the great area covered by the central tower. The enormous size of the tower at Talley may still be gathered from its ruins; it measures 38 feet across at the base and must have been, in its proportions, second only to the tower of St. Asaph Cathedral amongst the church towers of Wales. Upon the outer face of the remaining walls of the tower may be seen the marks which show that the pitch of the roof has been altered several times. Upon the east wall are three such marks. The loftiest of these three chancel roofs was no doubt the earliest, and the lowest is the latest in date, indicating the level of the roof of that part of the choir which, after the dissolution of the abbey, was walled in and retained for use as the chancel of the parish church.

From what has been said it is clear that Talley Abbey must have been a very impressive church, though not because of any elaborate carving or rich adornment, but simply from its noble proportions and massive grandeur. Especially, when viewed from without, must its tower have stood out boldly like a great fortress, as though intended as a reminder to men for all time of where their true refuge and strength lay. Even now, as we gaze upon its battered ruins, we must be impressed by it; its message can scarcely go unheeded, and we are constrained to exclaim:—

Guardian and monitor of all our days
Like fortress stern, thou bad'st men hope and dare.
Thy bells as angel-voices word on word
Chiming with sweetest music in the air
Called up men's hearts to Heaven, that they might praise
The tower of hope eternal—Christ the Lord.

EXETER CATHEDRAL.

THE Dean and Chapter of Exeter have issued a lengthy statement in explanation and defence of the steps they have taken to preserve the fabric of the cathedral, in the course of which they state:—

In the seventies of the last century, under the direction of the late Sir Gilbert Scott, a sum of 48,100*l.* was spent on the restoration of the cathedral, principally of the interior. Since that time further sums amounting to 22,307*l.* have been expended on the fabric, the organ, and the bells, exclusive of a very large amount, the gift of the late Mr. Willey, for the installation and fittings of the electric lighting of the cathedral and chapter-house. During the same period a further sum of about 10,500*l.* has been given by generous benefactors for stained glass, thirty-four windows in all, by the first artists in glass of the day, so that no less a sum than 80,907*l.* has been spent during the last thirty-five years on the cathedral. A further sum of 7,000*l.* is now wanted to complete the arrest of decay and safety of the cathedral and the beautiful chapter-house, which, as well as the cathedral, requires very careful attention.

The late Mr. Pearson in 1891 made a very thorough survey of the cathedral. He reported unfavourably of its then condition, having during his most careful survey detected much decay in all directions—more than he had anticipated—and he foresaw the spread of this decay. At the same date an independent report was made by Mr. Harbottle. Both reports are in our office; their agreement remarkable. We have been and are acting under the direction of the greatest architectural authority of recent times, supplemented by the knowledge and experience of one who is in daily touch with the fabric, and knows from long observation its real condition and its wants, and whose judgment thereupon was endorsed and approved by the late Mr. Pearson in 1891.

But we have a further advantage. When the great west window, on the insertion of the Temple Memorial glass, was dealt with, we had the advantage of the advice of the late Mr. Bodley, who thoroughly approved of the restoration of the stonework done under the direction of Mr. Harbottle. It was fortunate that the work was undertaken when it was; it was a remarkable instance of latent dangerous decay. If all this had not been detected, and the window had been left to itself, it would inevitably before long have fallen out, to the great injury of the western screen. It was most carefully dealt with, and every inch of the old stone which was preservable was used again.

It may be well here to give a brief statement of the recent work done on the great south tower. Here again we had a remarkable instance of latent dangerous decay at work, spreading and alarming, revealing itself, and it may not be amiss to remark that apparently when ancient stonework arrives at a certain stage of decay it is impossible to calculate the rapidity with which the decay will spread and the stonework enter upon its last stage of ruin. This depends much on the nature of the stone used, and the situation of the decay.

In the great south tower, settlement having been noticed, a thorough examination was made by Mr. Harbottle. The foundations of the walls were found to be of loose, badly built rubble masonry on black soil at a depth of about 4 feet 6 inches. The loose ground was removed at short stages to a hard gravel foundation, and the walls underpinned by a substructure of Portland cement concrete. Deep graves were found against the walls of the foundations. The walls of the tower above the ground level are built with two ashlar freestone faces—one on the inside mainly of plain squared stone, those outside the exterior of the richest description of Norman ornament. The total thickness of the walls varies from 8 feet to 6 feet.

The core of the walls is built of rubble masonry, which may be described as a filling between the two faces of ashlar stone. There appear to be very few bonding stones, and probably the face courses were laid first and the filling in followed.

The greatest structural defect was in the south wall, there being a crack quite 2 inches wide extending from about the level of the chapel roof to the top of the parapet through the whole thickness of the tower wall, thus allowing a great inroad for the weather; there were also cracks in the west wall of the tower. All these were carefully cut out and restored with sound ashlar, reusing as many as possible of the old stones. The body of the walls was grouted in with liquid cement injected under pressure, many tons of cement being used in the operations.

The south-east angle was found to be in a bad state. Here was originally the turret to the roof, which was at a later date filled in with bricks and mortar, with the result that the thin ashlar face suffered from the pressure brought upon it by the modern brickwork. All the bricks and mortar were removed where they were doing damage, and the back was properly rebuilt in stone, refixing the old ashlar and ornamental work so far as it was sound and suitable for reuse. Great care had been exercised in handling the old work. Wherever an old stone could be replaced it was marked and placed in its original position as a record showing how closely the new work is a careful reproduction of the old.

One of our great anxieties has been and is the great west screen; it is a priceless relique of the fourteenth-fifteenth century. But the problem before us is very difficult. No attempt has been made, nor will be made so long as I am Dean with the present chapter around me, to deal with the ancient figures of the west front; it is for their preservation that we are dealing with the canopies, niches, and other architectural surroundings; if these are not most carefully preserved nothing but featureless ruin awaits the whole front. We are doing our best in accordance with Mr. Pearson's directions, by careful attention to their weakened and crumbling surroundings, to preserve the ancient mystery of these featureless, mutilated figures, who, although so many of them are featureless and nameless, still speak to us of the past in language that we shall do our best to preserve.

We thought it was our duty to do our best to preserve all that was capable of preservation. Three courses were open to us—first, we might have left the west front untouched, on the plea that it was and always would be an interesting example of the architectural genius of the fourteenth-fifteenth centuries, however much it might suffer from the ravages of decay. This would have meant the disappearance at no distant date of its most prominent features, which would have been lost to posterity as a witness of the past. The second course was to treat the stone with certain well-known chemical solutions. Had the decayed stone been of a different nature, in a different condition, and in a different position we might have been advised to do this; but the nature of the decayed stone, its present condition, and its exposed position, were against such treatment. The third course open to us was to follow the advice of the greatest architectural authority of the day, who had the completest knowledge of the whole fabric and of the state of decay prevalent throughout. We followed, and are following, this

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third course unwaveringly, and with increasing confidence, because every fresh revelation of decay year after year confirms the accuracy of his judgment and the wisdom of his foresight.

The problem is very difficult. The decay is deeper, far deeper, than is generally suspected.

The great north-western pinnacle, which has sometimes been spoken of as a perfect specimen of the fourteenth-fifteenth century, is only very partially original; the carved heads were comparatively modern, and were stuck on as terminals to the crocketted rolls of the pinnacle, the foundation of the pinnacle with its panels being stuck against a core of loose rubble, and formed of pieces of stone sometimes called "shiners," which were not structural. There was, indeed, very little of the pinnacle original, and as the panels were leaving the core and all leaned towards the west, and as decayed pieces had frequently fallen, the chapter were advised that it was very dangerous. It has been replaced in solid and very beautiful stone, which is rapidly toning to a soft grey, and such of the original parts as could be reused have been carefully replaced.

The restoration of a portion of the parapet of the sculptured front. Repairs to the south-west turret. Restoration of one panelled and crocketted buttress at the south-west end of the screen. Restoration of two panelled and crocketted buttresses at the south-west end of the screen. Restoration of two carved canopies at the south-west end of the screen, and securing the figures. Restoration and repairs of the carved canopies, panelled and carved shafts and cornice to south-west portion of the screen. Restoration of canopy and of the panelled and crocketted shaft. Securing figures by copper bolts. Restoration of south-west angle of north-west buttress and canopy on south-west of same, and repairs to the canopies of niches. In hand: Repairs to sculptured parapet of north section.

We have decided to introduce a magnificent stone, very similar to one with a slightly reddish tone largely used by the original builders. Observing that the stone with the reddish tint had stood the lapse of time and the assaults of weather, still retaining its chisel life and beauty, we naturally sought for a stone similar in character. We found it at Ketton, near Stamford; it has a slightly yellowish tinge which very rapidly on exposure tones into a delicate grey. In a few years the slightly yellowish tinge will have passed away. One of our most eminent sculptors, who has handled it in situ on the west front, an artist of the highest rank says, "It is a magnificent stone for the purpose, and the carving of it is admirable." The same stone is being used exclusively at York Minster, and for all the figure carving at Beverley; it is being largely used on many important buildings in Cambridge; was exclusively used for the very fine clock tower at Leicester; it is largely used for churches in Norfolk and Suffolk, and has been used for similar purposes for 400 years.

Our beautiful chapter-house, the work of Bishop Briwere the Crusader, who founded the deanery in 1225, and of Bishop Lacy, 1420, who was chaplain to Henry V. at the battle of Agincourt, and, therefore, probably one of those who in the early dawn of that great day gave the Blessed Sacrament to the army, has for some years caused us grave anxiety. This came to a head in 1902, when it was observed that the mullions of the great east window, a fine specimen of Bishop Nevylle's Perpendicular work (1456) were very insecure and out of the straight, and the head of the window evidently suffering from pressure. On examination it was found to be in a very serious state, and leaning to the west with an iron bar let into the transom. It was taken down stone by stone, each stone being marked and carefully reset in its original position if sound, and at the same time some old heraldic glass which had been found was carefully arranged in the windows. In the following year a serious defect was observed in the western gable, which was leaning away from the beautiful roof, the work of Bishop Bothe in 1465, so that the daylight was visible; the whole gable down to the springing of the arch of the western window was insecure. It had been badly built or restored of old stone previously used, and there were no bond stones; it is a marvel that it had stood so long. In the year following all the battlements on the north side were found to be in such an unsafe state that they were taken down and laid on the flat roof, where they remained for some time, but they have since been securely replaced; and last year all the beautiful Perpendicular windows on the south side were found to be in a very bad condition; we were obliged to remove one label which was hanging away from the wall in several places. The tracery and mullions are in a very dangerous and decayed condition, and last month the mullions of some of the windows on the north side were found to be in such a condition that it was not thought advisable to clean the windows. This is the next work to which we must turn our attention.

The following short summary will disclose our present position of need:—Required for the completion of the great west front, 2,245*l.*; for the chapter-house, 700*l.*; for general work on the roof, pinnacles, battlements, buttresses, windows, &c., 3,955*l.*; total, 6,900*l.*

BRASENOSE COLLEGE, OXFORD.

By John Buchan.

BEFORE the sixteenth century, between the High Street and Brasenose Lane, and encroaching on the ground which is now the Radcliffe Camera, stood a cluster of little halls with gardens to the west of them. There was Brasenose Hall and Little University Hall, Salisbury Hall and St. Mary's Entry, Little Edmund's and Haberdashers', Black Hall and Glass Hall. They were owned as a rule by larger colleges like University and Oriel, or by religious bodies like the Canons of Oseney; but Brasenose Hall was an independent community with a master of its own. The old Aula was not a college in the strict sense, but rather a community of students who chose to lodge together and framed a few simple rules for their Society. For long the Halls were not subject to University discipline, but were simply academic hostelries—places of lodging rather than of learning. Many of them had a sign like an inn over their doors, and this undoubtedly was the origin of the famous Brazen Nose. As Antony Wood says:—"The College was now finished out of the ruins of several hostels, the chief of which was Brasenose Hall, so called without a doubt from such a sign which was in ancient times over its door, as other Halls also had—namely, Hawk or Hieron Hall, Elephant, Swan or Black Hall." So the derivation of the name from Brasinium or Brewing-House may be confidently discarded. When early in the fourteenth century many Oxford clerks migrated to Stamford, in Lincolnshire, the students of Brasenose Hall held together and had a house of their own, which argues that a certain solidarity had been reached in the little organisation.

The Hall grew into a College early in the sixteenth century, and the pious founders were William Smyth, Bishop of Lincoln, who was Chancellor of the University from 1500-3, and Sir Richard Sutton. The little Halls were bought up or leased on a long term, and in 1509 the foundation-stone of the College was laid. The stone came from the famous quarry on Headington Hill, and the building began in the south-west corner of the Old Quadrangle. The College was not, like Corpus Christi, the result of the new learning, but apparently designed as a protest against it and as a sanctuary of the old tradition. The Hall had drawn its students mostly from the North Country—the part least influenced by the new movement—and the College continued the custom of the Hall. The charter of foundation is dated 15$\frac{11}{12}$ and the first statutes were completed in 1514. At first there was only one quadrangle of one storey and garrets, with a tower over the gate which contained the Principal's lodgings. The chapel was a little oratory on No. 1 staircase where is now the senior common room. It was not till the time of James I. that a second storey was added, an addition which did not, as at New College, spoil the proportions of the old buildings.

Entering the College by a gate opposite the Radcliffe Camera we find ourselves in the Old Quadrangle. The centre is filled with grass, but at one time there used to be an elaborate maze, which may still be seen in Loggan's view of the College in 1675. The maze was removed in 1727 and its place taken by a statue of Cain and Abel, painted a staring white, which was a source of temptation to festive undergraduates. It purported to be by John of Bologna, but was almost certainly an indifferent copy, though its removal remained always a sore point with Walter Pater. In 1881 grass replaced it, and to-day the Old Quadrangle is a very pleasant, green, well-proportioned place. The great chestnuts in Exeter Gardens, the dome

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of the Radcliffe, and the towers of All Souls make an effective background to its staid simplicity.

On the south side is the Hall, which remains much as it was at the foundation. Till the middle of the eighteenth century the fireplace was an open one in the middle of the floor, and the louvre is still there, though hidden by the ceiling. The present handsome chimneypiece was presented to the College in 1760 by Lord Curzon. The north window at the east end contains portraits of Smyth and Sutton, the founders. The south window was placed there to commemorate the visit of Louis XVIII. of France, who lunched in the Hall with the Principal and Fellows. None of the pictures on the walls are remarkable, but the little one of Alexander Nowell depicts the Dean of St. Paul's with his fishing tackle around him, and has had the honour of being described at length by Isaak Walton.

Passing below a dark archway to the left of the old gate we enter the second Quadrangle, which dates from the middle of the seventeenth century. It is a quaint little place, planted with shrubs, with the library on the east, the chapel on the south, and the kitchen on the west. For some reason which I have never been able to discover it is known as the Deer Park. The eastern side used to be cloisters below the library, but early in the nineteenth century, when residence in College was made compulsory, the cloisters were turned into rooms. The chapel was built from 1656-76, and is ascribed by tradition to Sir Christopher Wren. It is chiefly remarkable for its roof, which is a fine piece of fan tracery, said to have been brought from the chapel of St. Mary's College. It was certainly brought from somewhere, for it does not quite fit. The architecture is an agreeable mixture of Greek and Gothic, and though it cannot be compared with the more famous Oxford chapels, it is a good example of its period. The library, which adjoins the chapel, belongs to the same date, and is attributed to the same architect. The old library used to be on the north side of the Old Quadrangle, which is now used as a lecture room. The kitchen and buttery are among the oldest parts of the College, and in the latter may be seen the portrait of the Lancashire giant, the "Child of Hale," after whom the Brasenose boat is always named.

South-west of the Deer Park is the New Quadrangle, with a gate opening on the High Street. It is filled with grass plots and flower beds, and the bare spaces between make a convenient site for bonfires. Early in the eighteenth century the College bought up the old houses between St. Mary's Entry and All Saints Church, and began to talk of a front in the High Street. Nicholas Hawksmoor—the same who built the High Street front of Queen's—submitted designs for the work in the same style, which are engraved in Williams's "Oxonia." They were singularly inappropriate and were fortunately rejected. The project languished for nearly a century, till Sir John Soane prepared designs again in 1807. Nothing came of them, and it was not till the eighties that the College employed for the work Mr. T. G. Jackson, who has done so much to preserve the peculiar charm of Oxford. By 1887 the New Quadrangle had been built in the Gothic style, which harmonises well enough with the old buildings. On the High Street front there is a gateway and tower with the Principal's House—a very handsome building—on the east of it. On the other side of the Quadrangle is the new junior common room, and facing the chapel is a large block of buildings occupied by undergraduates' rooms. There is still a little gap at the south-west corner which leaves the Quadrangle incomplete, and it is to be hoped that this space may shortly be filled up.

The interest of Brasenose is not architectural, save in so far as it is a typical example of the smaller sixteenth century collegiate foundation. The Old Quadrangle is in its own way as perfect as any in Oxford. But the situation of the College in the very heart of the city, surrounded by many stately neighbours, lends it adventitious charms. If it lacks gardens and greenery it has a rich environment of its own, for in any view—more especially from the Old Quadrangle—the chestnuts of Exeter, the huge tower of the Bodleian, the great dome of the Radcliffe, the spire of St. Mary's, and the pinnacles of All Souls are part of the scene. Walter Pater appreciated this aspect of the College, for he used to defend bonfires in the Quadrangles on the ground that they cast a beautiful glow upon St. Mary's spire.

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 16, MR. G. H. FELLOWES PRYNNE, F.R.I.B.A.

MR. G. H. FELLOWES PRYNNE has attained the position of being one of the foremost of the Church architects of the present day. He has had the good fortune to have clients who usually have not expected a good building for an inadequate sum. He has been a very popular President of the Architectural Association.

NO. 17, MR. WILLIAM A. PITE, F.R.I.B.A.

MR. WILLIAM A. PITE had made his mark repeatedly in open competitions, and has now by his work at the new King's College Hospital become enrolled amongst our acknowledged experts in hospital planning.

ST. CHAD'S CHURCH, FAR HEADINGLEY, LEEDS.—NEW CHANCEL AND VESTRIES.

IMPORTANT additions and alterations are in course of erection at the eastern end of St. Chad's, Headingley. The circular apse, which proved inadequate to the needs of the parish, has been demolished, and, when the present works are completed, will be replaced by a new choir and square-ended sanctuary of the same height and width as the nave. A choir-vestry, organ-chamber, and porch are being added on the south side, and on the north a clergy-vestry and chapel. The two sides are connected by a passage cut in the thickness of the east wall. All the stonework of the old walls has been reused in the extensions. The ground slopes sharply away on the north and east sides, thereby giving the lofty effect that is noticeable in our illustration. Horsham stone is being used both externally and internally. The wall surfaces are to be plastered. It is hoped to decorate the ceilings, also to introduce colour in the fittings and gild the grilles. This design was selected in a limited competition last year by Messrs. Nicholson & Corlette, the assessors. The perspective was hung in the Academy. Messrs. Wilson & Sons, of Leeds, are the builders. Messrs. John Gibbons & Son are the architects.

SECOND PREMIATED DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

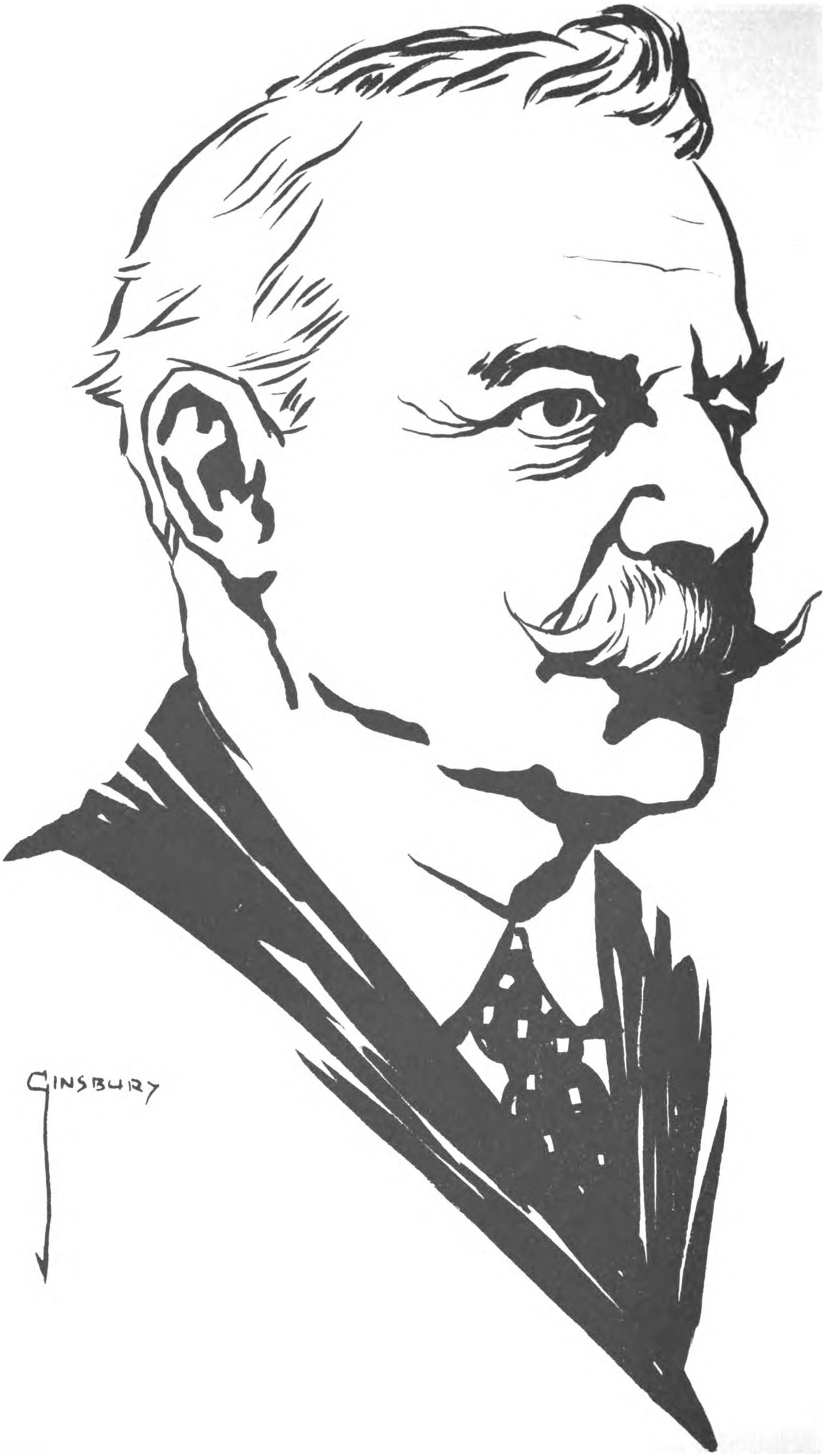
IN the accompanying design by Mr. E. J. Shrewsbury the various departments are arranged on separate floors and in distinct blocks, and direct communication is provided for between the heads of each department and their assistants. All the general offices and waiting-rooms are close to the main staircase and lift, which are centrally placed, immediately opposite to the entrance. A secondary staircase is provided from the first to the third floor.

Access to the Assize Court from the new buildings is arranged on the ground floor and also on the first floor.

The committee-rooms are so placed as to be in direct communication with the Court.

Both rooms have a considerably larger area than is required by the conditions, and the education committee room is arranged to be divided into two rooms, each having its own fireplace and entrance door. The provision of central areas allows for efficient lighting and ventilation of the whole of corridors and lavatories. Separate cloakroom and lavatory accommodation is provided for (1) Members of committee, (2) officials and staffs of the various departments, and (3) ladies. The caretaker's apartments are placed in the basement, with a separate entrance. Storage for forty bicycles is also obtained in the basement, with a separate entrance, and so arranged that all machines can be separately placed. For the elevations Lawrence's Bracknell facing bricks would be used, with Portland stone dressings, the roofs to be covered with Tilberthwaite Westmoreland bright sea-green slates. The floors to be in reinforced concrete with metal lath ceilings suspended under. The buildings throughout to be warmed by radiators, fireplaces also being provided in all principal rooms and ventilating flues carried up in chimney stacks.

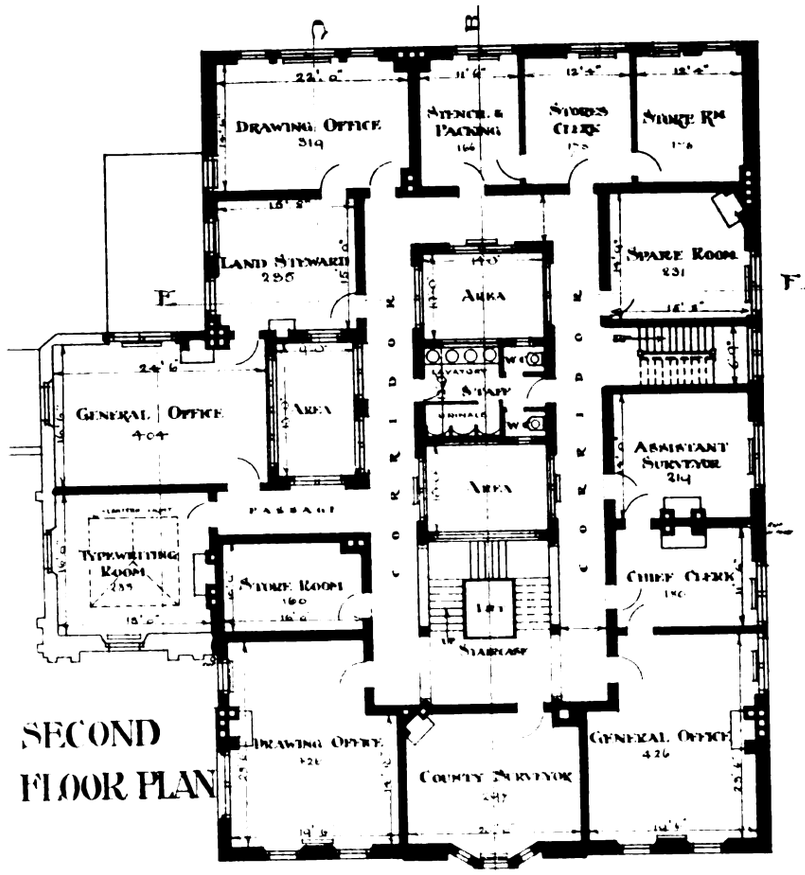
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LIVING ARCHITECTS. No. 16: MR. G. H. FELLOWES PRYNNE, F.R.I.B.A.

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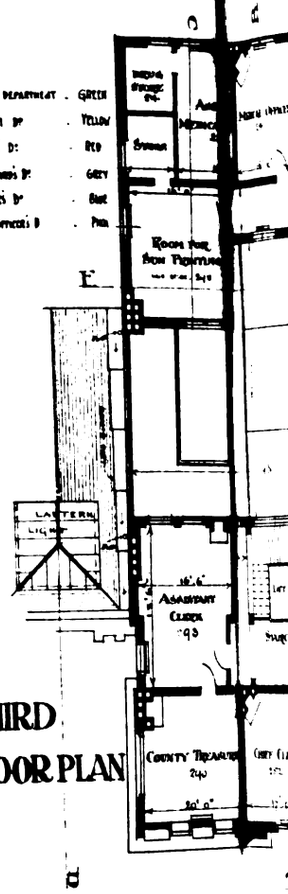


SECOND FLOOR PLAN

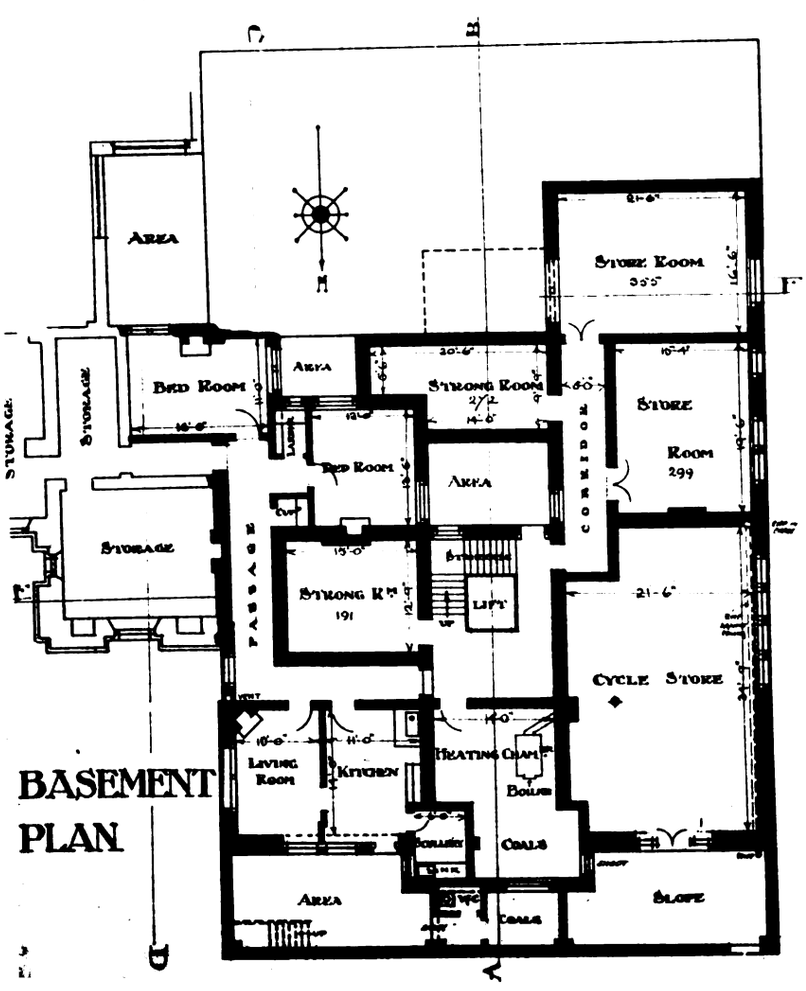
NOTE

THE VARIOUS DEPARTMENTS ARE DISTINGUISHED BY DIFFERENT TINTS.

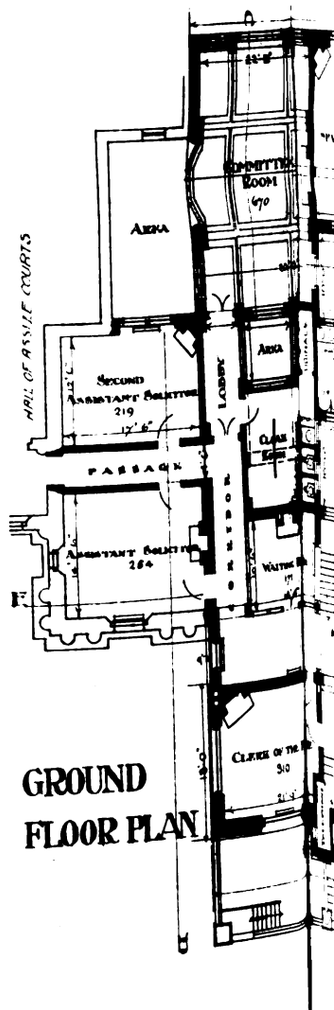
CLERK'S DEPARTMENT . GREEN
EDUCATION D° . YELLOW
SURVEYOR'S D° . RED
LAND STEWARDS D° . GREY
TREASURER'S D° . BLUE
MEDICAL OFFICER'S D° . PINK



THIRD FLOOR PLAN



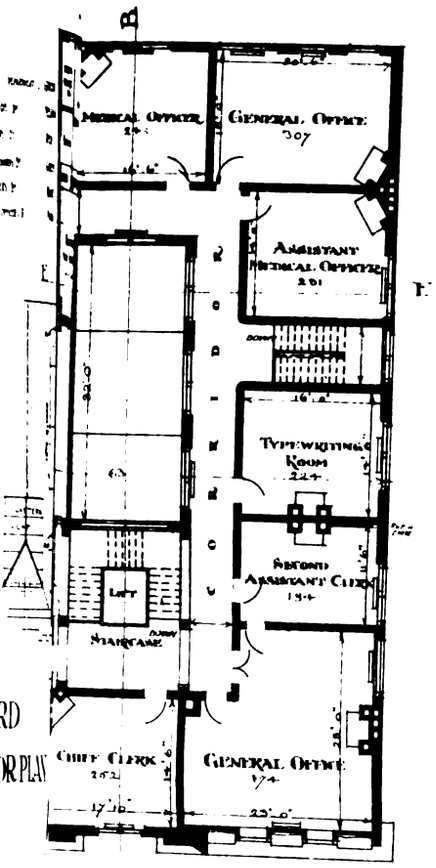
BASEMENT PLAN

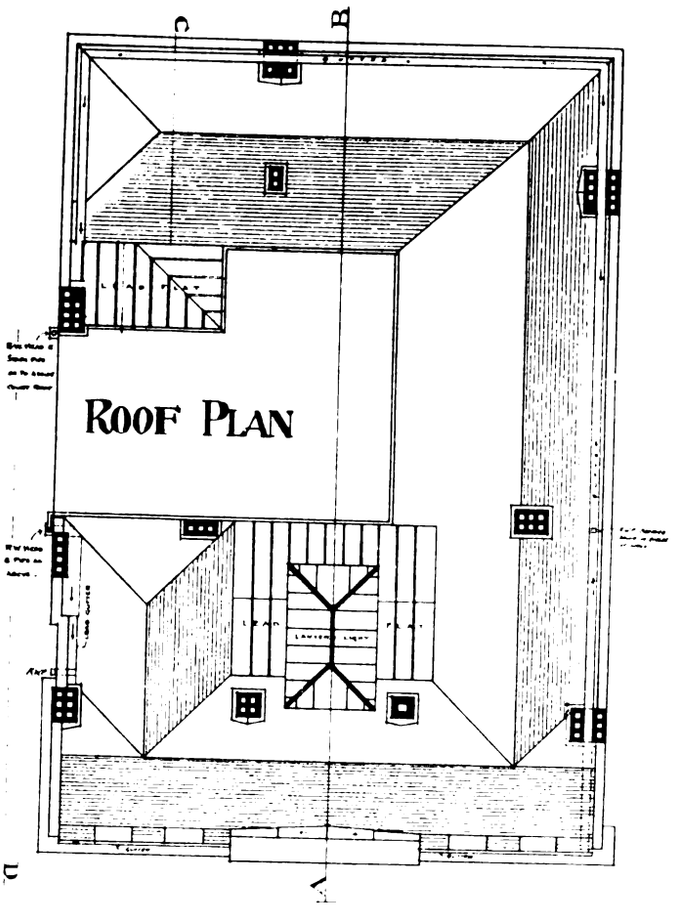


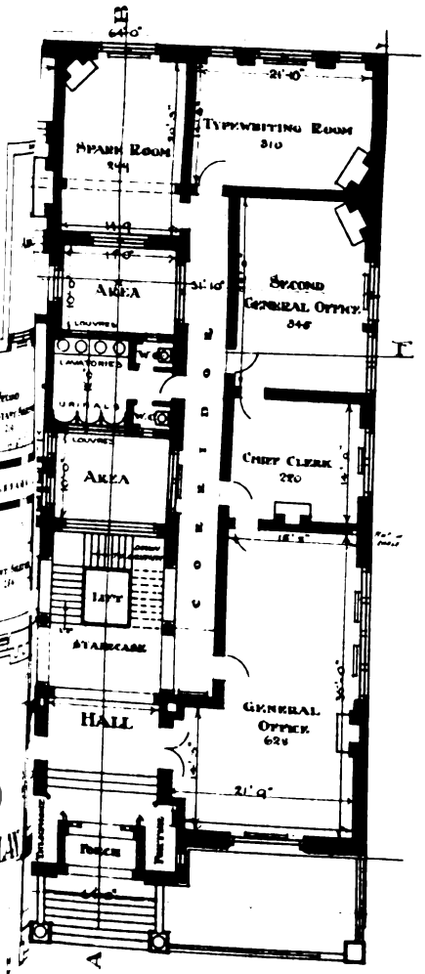
GROUND FLOOR PLAN

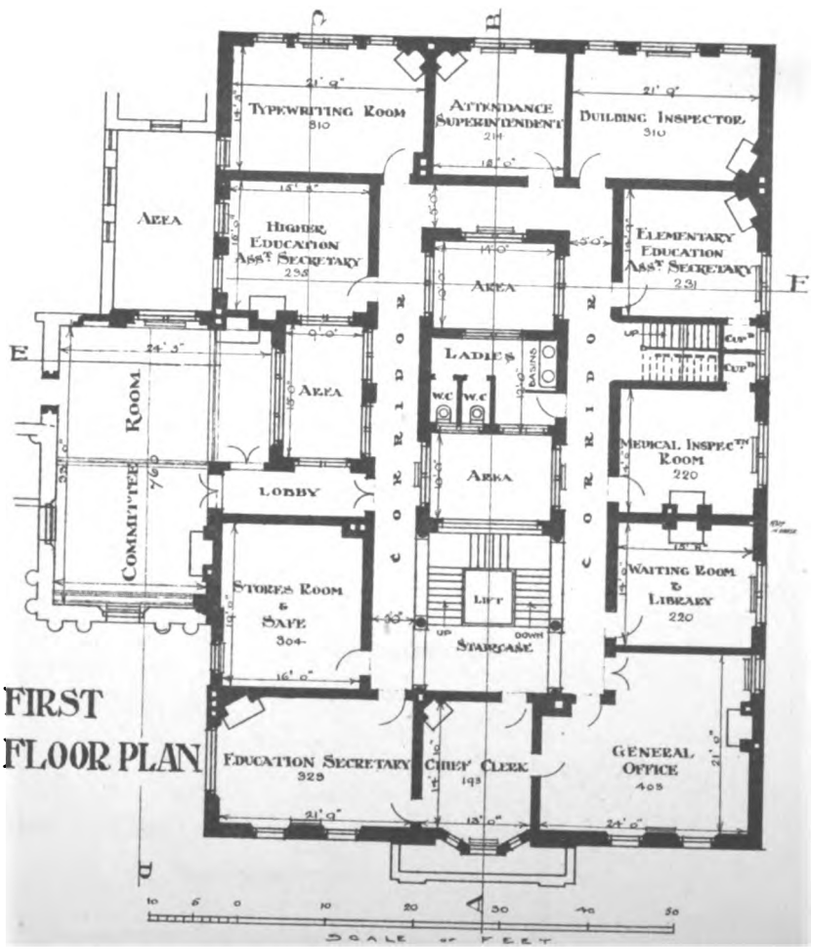
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FIRST FLOOR PLAN

RE COUNTY COUNCIL OFFICES, READING.

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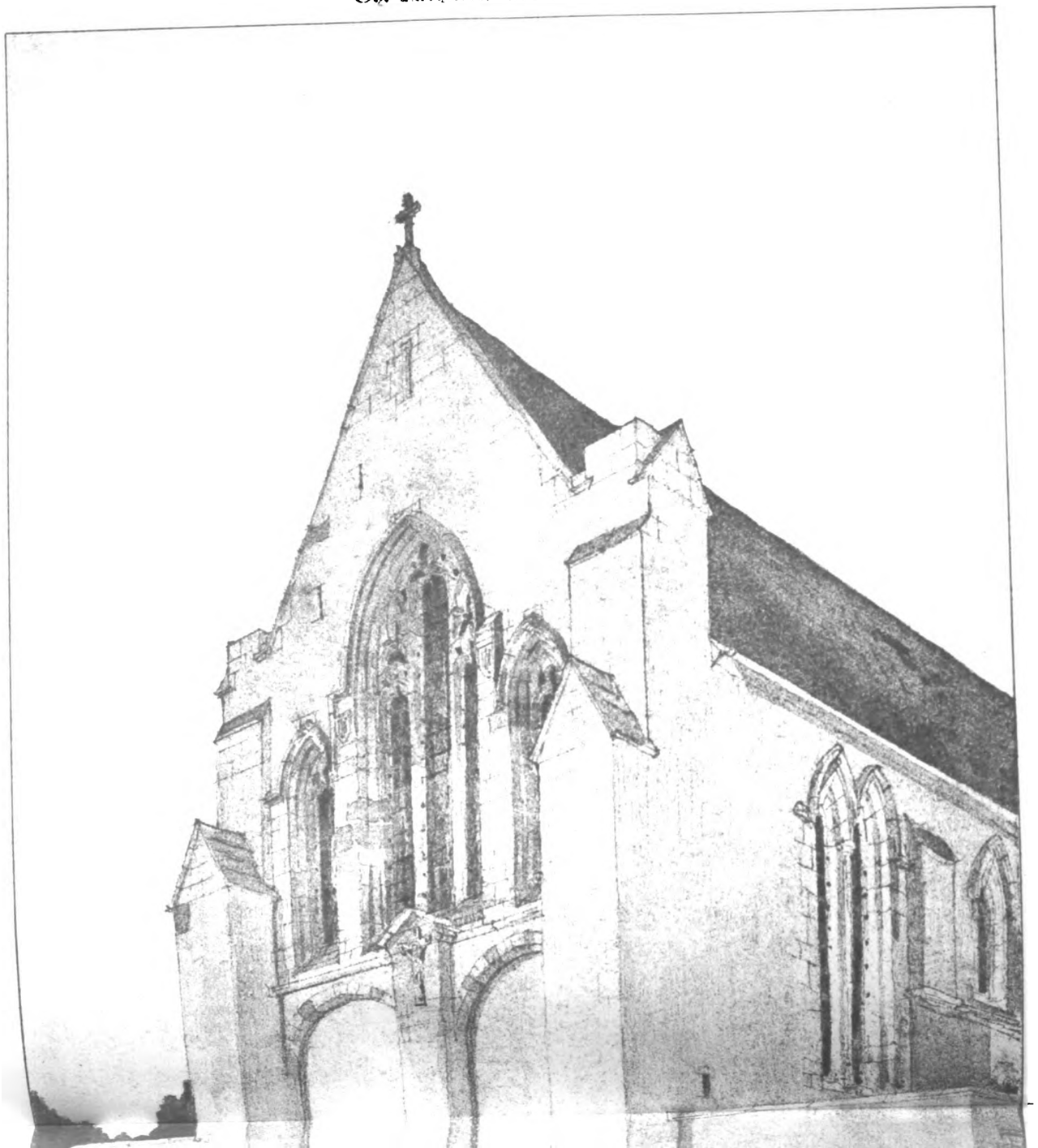
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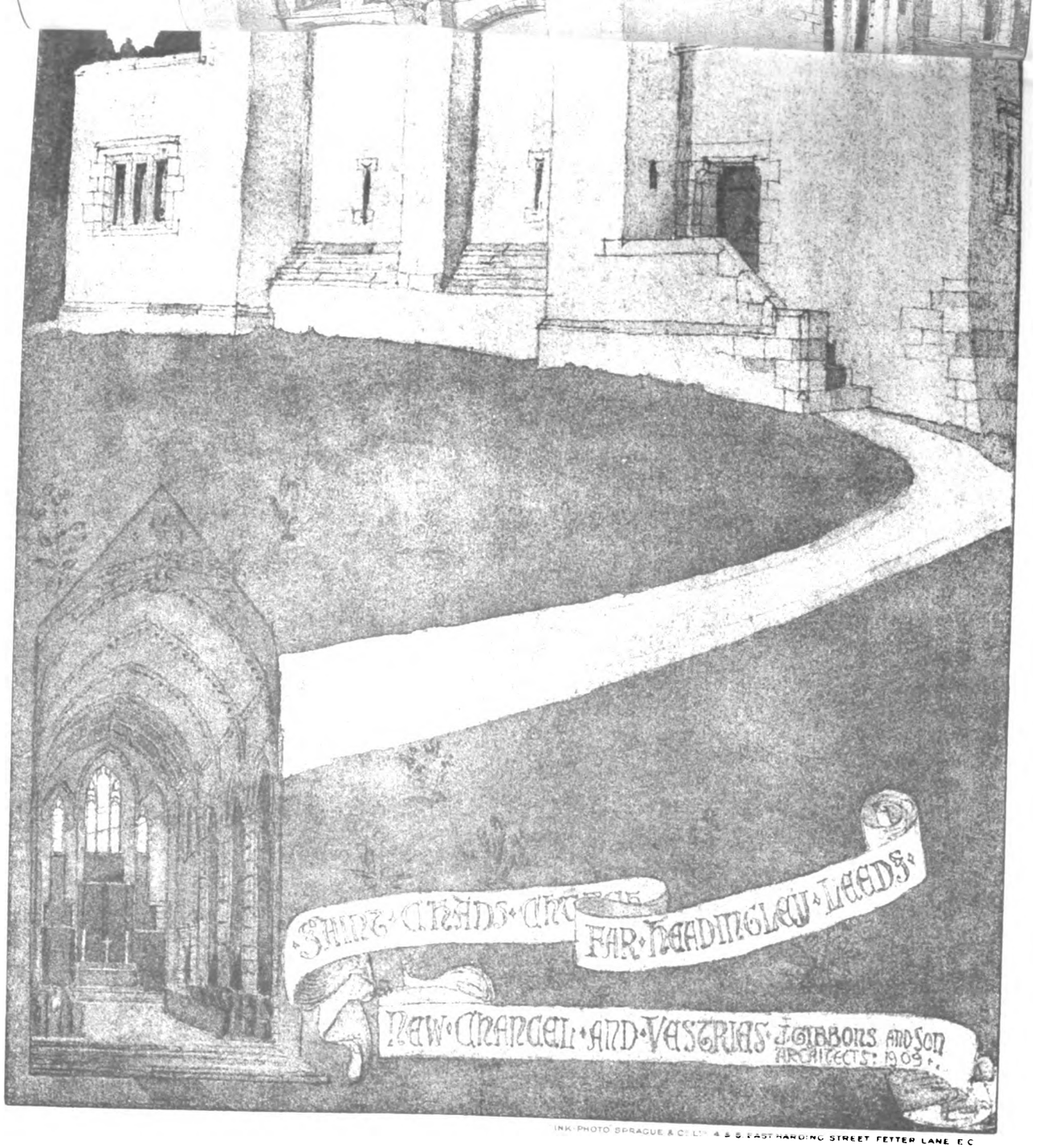
UNIVERSITY OF CALIFORNIA

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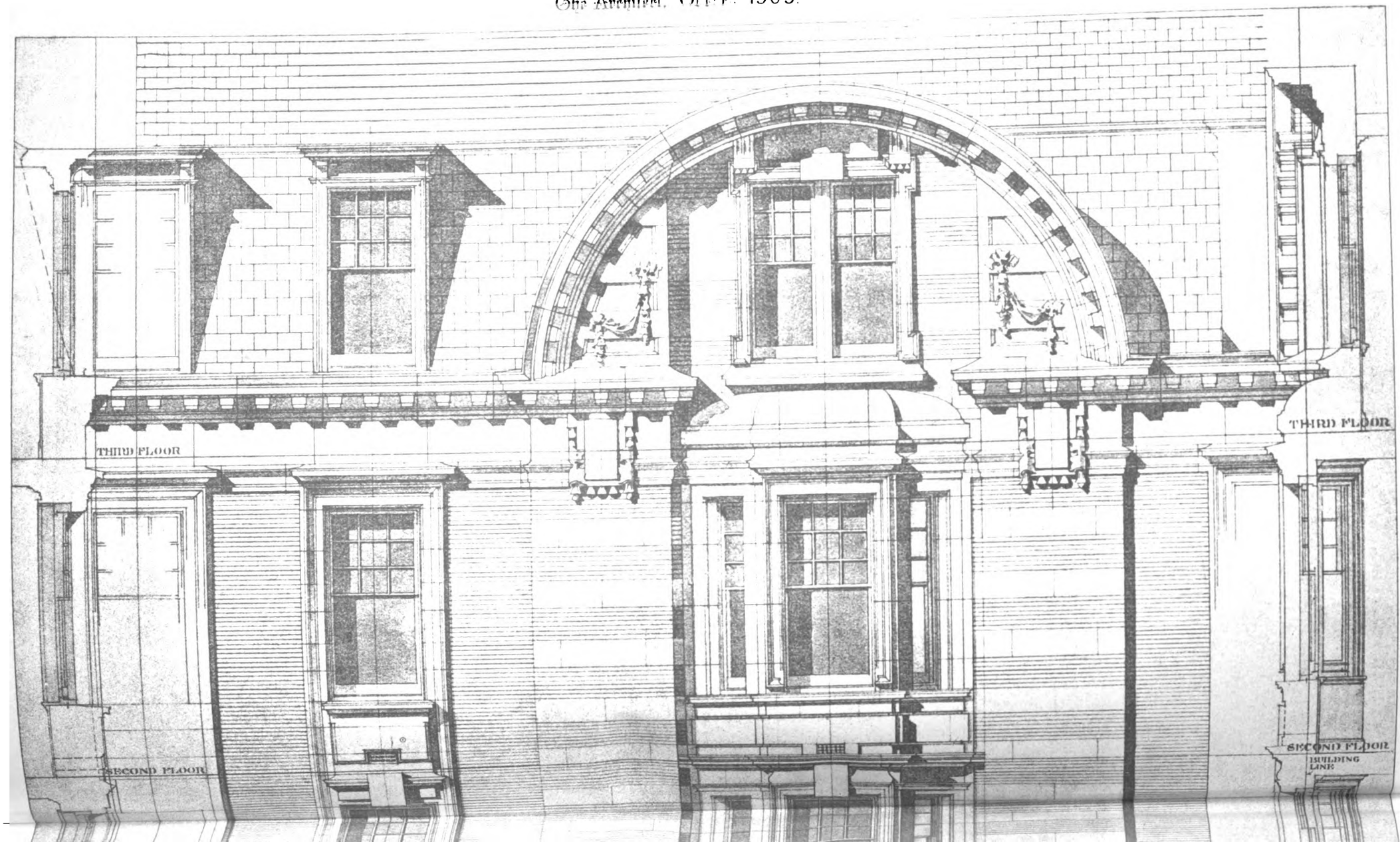
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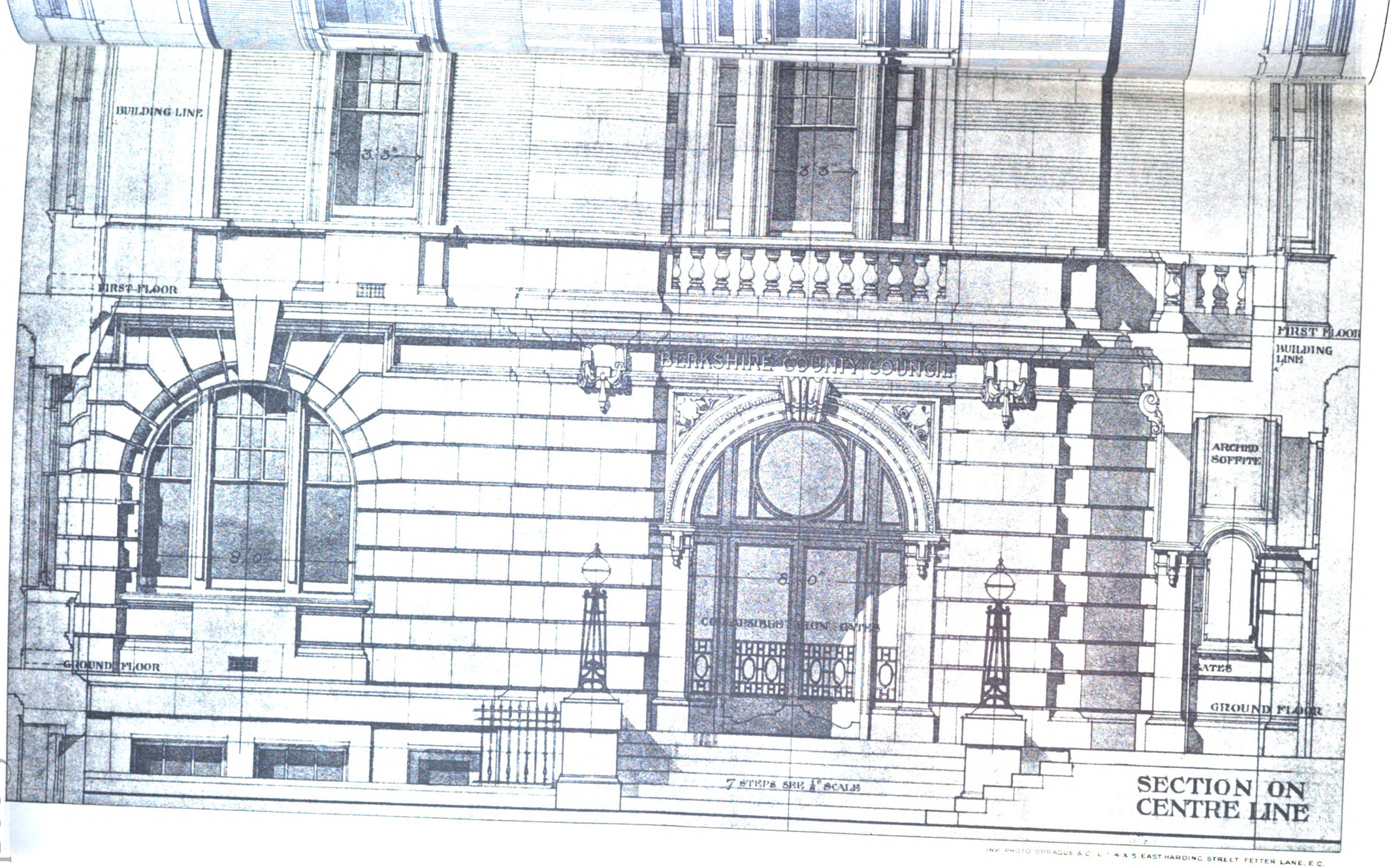
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SECOND PREMIATED DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

By E. J. SHREWSBURY A.R.I.B.A.

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LIVING ARCHITECTS. No. 17: MR. WILLIAM A. PITE, F.R.I.B.A.

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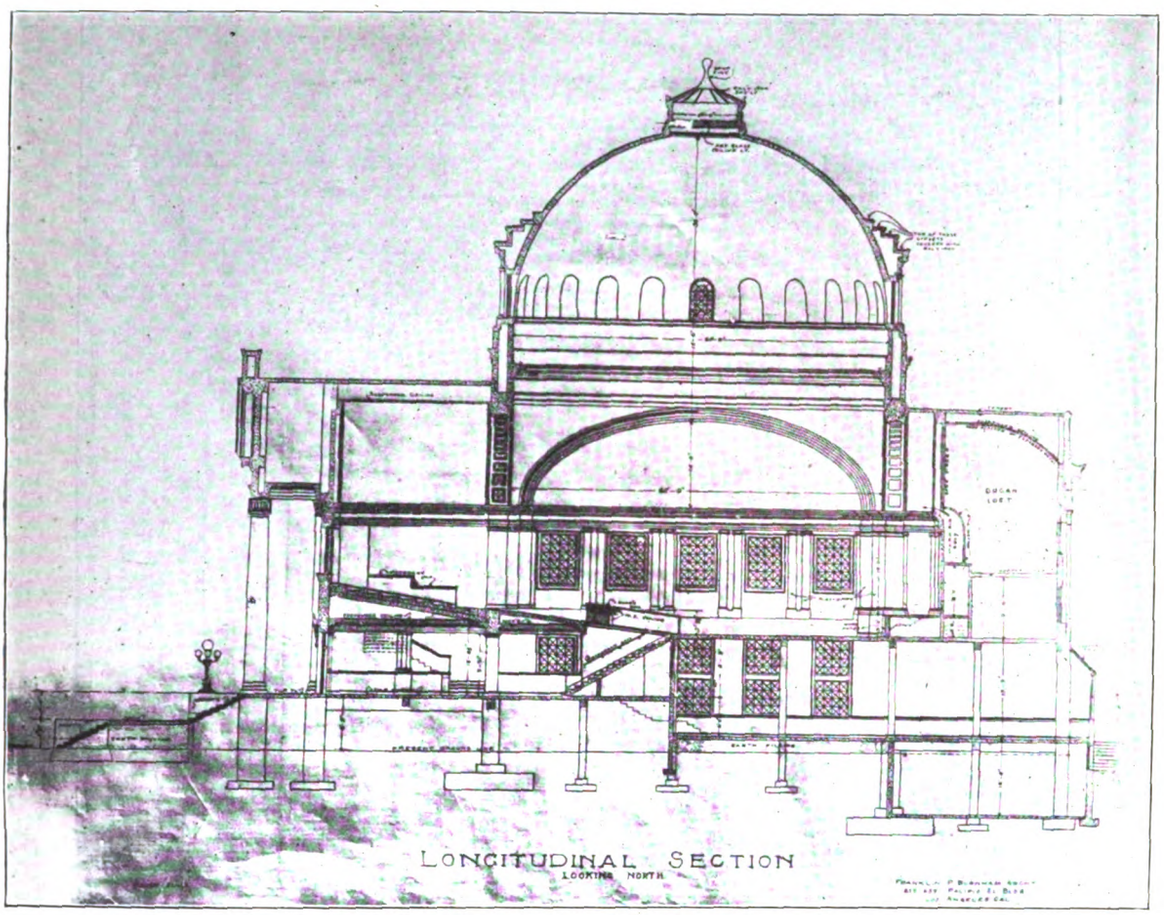


Fig. 1.—CONCRETE CHURCH, PASADENA.

A CONCRETE CHURCH, PASADENA, CALIFORNIA.

THERE is now being constructed in Oakland Avenue, Pasadena, California, by the members of First Church of Christ Scientist, a reinforced concrete church, the design for which presents many unusual features. The walls, floors, footings, beams, columns, stairs, dome, cornices, and all projections and ornamentations and entire roof construction are of reinforced concrete.

The detail of the structure is based on the Grecian Ionic style. The site is 4½ feet above the street level. The building is 120 feet by 120 feet, and when completed will be one of the finest edifices owned by this denomination, noted for its beautiful churches. The simple lines of the construction will make it one of the most distinctive in Pasadena. Fig. 1 shows the section, fig. 2 the main floor, fig. 3 the ground floor, and fig. 4 the perspective view of the building when finished.

The ground and auditorium floors are of the general slab and beam construction, with ordinary Kahn tile floor 14 to 17 feet floor spans and beams 18 to 24 feet. The floors are carried by columns which extend down to concrete footings. The building rises to an extreme height at the top of the dome 93½ feet. The dome itself is hemispherical, with an interior diameter of 60 feet, and has at its top a lantern with a diameter of 10½ feet internal measure. The dome will be constructed of a reinforced concrete shell varying in thickness from 4 inches at the lantern to 8 inches at the foot of the dome, the dome resting directly on the ring, which is itself 2 feet deep. The ring in turn is carried by four reinforced concrete arches of 60 feet span and 14 feet rise; these arches will be 3 feet wide throughout their length and 2 feet deep at their crowns. These four arches are carried by four columns 36 by 36 inches, reinforced with twelve 1 inch square bars. The four columns supporting as they do the entire roof construction, including dome, arches, &c., extend down through the auditorium and ground floors and rest on 14 by 14 feet reinforced concrete footings. The distance from the auditorium or upper floor to the crown of the dome is 79¼ feet.

A feature of the plan is the grand foyer, from which five external entrances will open; four stairways lead from the foyer to the auditorium above, and two entrances open into the Sunday school-room, which has a seating capacity of 800 persons. The auditorium will seat 1,400 persons and is well lighted through twenty-four windows of white cathedral and amber glass. Throughout the interior the finish of the building will be of white enamel, the doors being of mahogany. The exterior finish will be made by plastering with a thin coat of cement mortar made of marble dust and La Farge cement, and lined off to represent stone blocks, which will have the effect of a white marble structure. Franklin P. Burnham is the architect, Jay B. Harris structural engineer, and F. O. Engstrum Company are the contractors. The building is well advanced, the floors are in place, and the work is now progressing on the four 60 feet arches under the dome.

THE CORROSION OF IRON.*

IT is well known that iron readily corrodes when exposed to the action of liquid water and air at ordinary temperatures. At first this was regarded as a simple case of oxidation, similar to that which obtains when iron is heated in air. We now know, however, that the reaction is more complex, and several theories have been suggested by way of explanation. Of these there are two only which merit consideration here, for the others have already been proved to be untenable. These are what are known as the acid and electrolytic theories respectively.

According to the former, as its name implies, pure water, oxygen and iron may remain in contact with one another for an indefinite period without the formation of rust. The presence of a trace of some acid to act as catalyser is absolutely essential if oxidation of the metal is to begin. As carbonic acid is very prevalent in natural air and water, we may asume that in all ordinary cases of rusting it is this acid which acts as the catalyser, by attacking a portion of the iron, forming ferrous carbonate, $FeCO_3$, or perhaps the soluble ferrous hydrogen carbonate, $FeH_2(CO_3)_2$. This is then converted into rust by the oxygen of the air with the

* A paper read at the autumn meeting of the Iron and Steel Institute, by J. Newton Friend, Ph.D., M.Sc. (Darlington).

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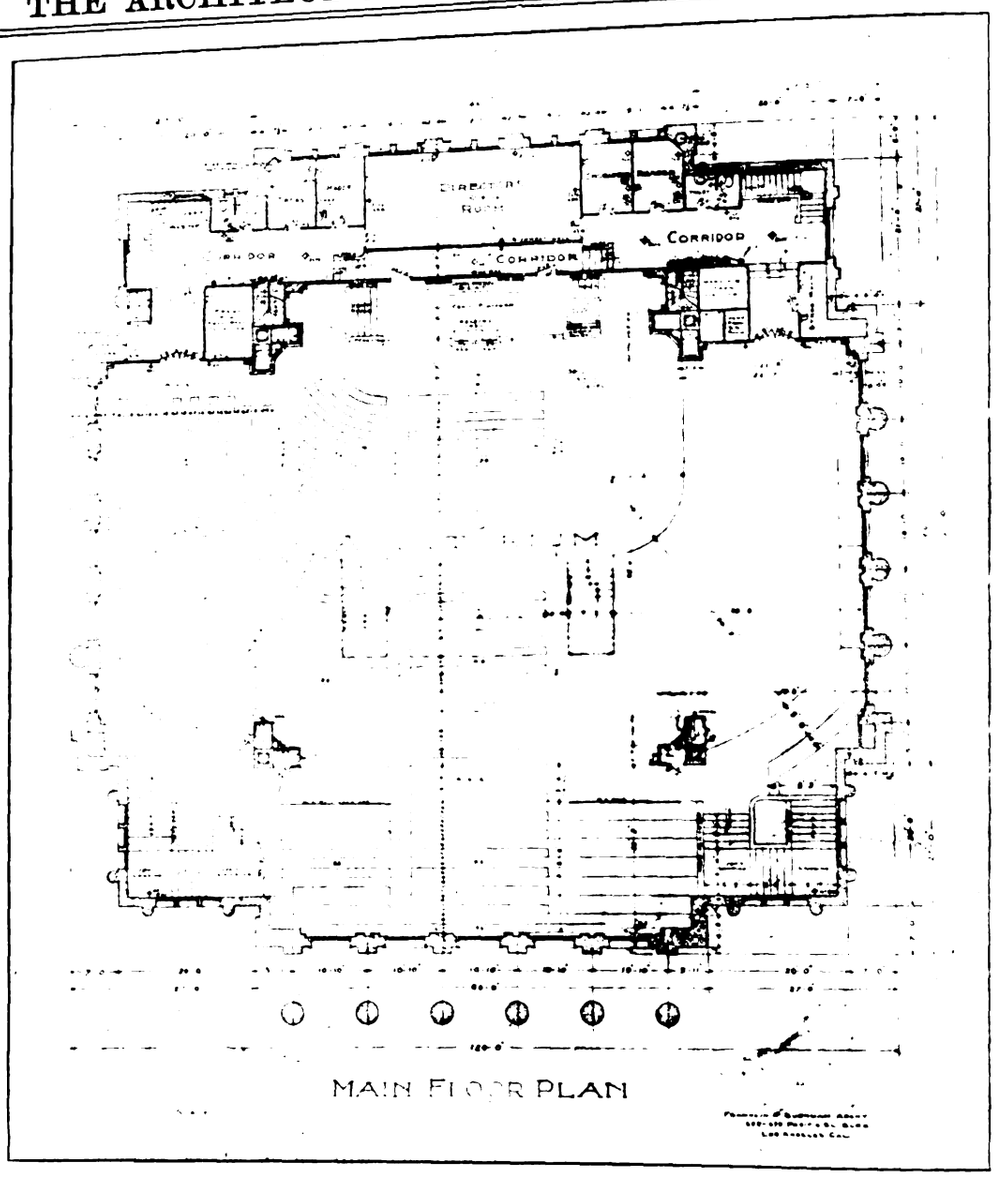


Fig. 2.—CONCRETE CHURCH, PASADENA.

simultaneous liberation of carbon dioxide, which is now free to attack a fresh portion of the iron. We thus see that an infinitesimal amount of carbon dioxide in the presence of water and oxygen would be capable of converting an indefinite amount of iron into rust.

I may, perhaps, at this point be allowed to take exception to Dr. William H. Walker's recent statement that I am a supporter of the so-called "carbonic acid theory of corrosion." This theory implies that carbonic acid is the only acid which can or does affect the corrosion of iron, whereas it should be well known that any acid capable of attacking iron is also effective. In my previous paper, already referred to, carbonic acid was cited for the reason given above. It is to the general "acid theory of corrosion" that the results of numerous experiments compel me to adhere, and the importance of bearing this distinction in mind has already been emphasised by Dr. Gerald T. Moody in a letter to *Nature* of March 7, 1907.

According to the electrolytic theory of corrosion, on the other hand, the presence of an acid, even in traces, is not essential to the oxidation of the iron, liquid water and oxygen alone being necessary. It is assumed that pure water is ionised to a small but definite extent, and that when a strip of iron comes in contact with it, positively charged iron ions are sent out into the water. Hydrogen ions simultaneously leave the liquid, which latter now becomes virtually a solution of ferrous hydroxide in water. Thus:—

$$Fe + 2H^{\cdot} + 2OH' = Fe^{\cdot\cdot} + 2OH' + H_2.$$

Addition of oxygen now causes the ferrous iron to assume the ferric condition, and rust appears.

It might appear at first sight that to decide between the two theories would be a matter of great simplicity, for the presence of an acid can readily be detected by means of certain reagents such as litmus and methyl orange. But further consideration shows that such is not the case. It has already been pointed out that, according to the acid theory, a single molecule of acid is sufficient to start the process of rusting, and certainly in practice a very small number would be able to produce a visible effect in a few hours. Remembering that several million molecules of an acid could be placed side by side in a line less than 1 centimetre in length, it will be clear that millions upon millions of such molecules would be necessary to respond to a colour test gauged by the naked eye. Hence such a method breaks down at once. We are bound, therefore, to arrive at our conclusions in a more or less indirect manner, and hence arises so much uncertainty. In my previous paper I have given a detailed account of experiments performed in two glass bulbs connected together internally, but hermetically sealed from the air. One bulb contained sodium hydroxide, and pure CO_2-free water was distilled from it on to a strip of pure iron in the second bulb. It is a noteworthy fact that when the water was distilled from the $\frac{1}{30}$-normal sodium hydroxide solution the iron readily rusted, but when the alkalinity was normal no rusting took place, save at the edges in contact with the glass. This freedom from rust in the latter case is attributed by the advocates of the electrolytic theory of corrosion to the solution, by the distilled water, of some of the alkali from the glass, whereby the number of hydroxyl ions was increased and the number of hydrogen ions proportionately reduced. But if such was the case, the same source of alkalinity should have prevented the formation of rust when the $\frac{1}{30}$-normal sodium hydroxide solution was used. But it did not, and the explanation is thus seen to break down.

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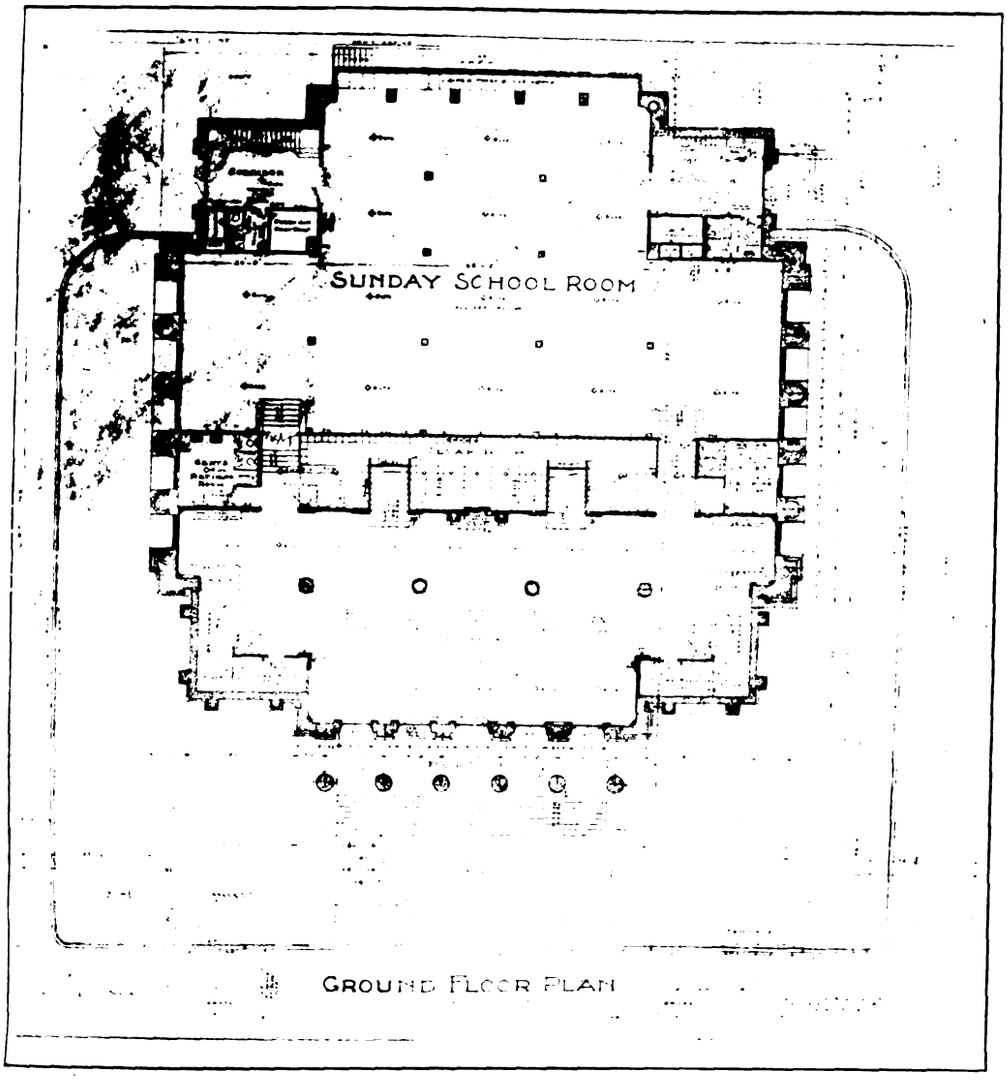


FIG. 3.—CONCRETE CHURCH, PASADENA.

According to the acid theory, on the other hand, a ready explanation is forthcoming. It need not, however, be repeated here, as it has already received full treatment in the paper referred to.

Again, in all experiments hitherto published, in which iron is said to rust in contact with pure oxygen and water, it is easy to show that sufficient precautions have not been taken to make the removal of all traces of acid an absolute certainty. Thus Tilden overlooks the fact that barium hydroxide has a very definite equilibrium pressure of carbon dioxide. He also assumes that by merely warming an exhausted glass tube every trace of adherent air can be removed from its surface. But numerous researches of recent date have shown that such is far from being the case. The experiments of Dunstan, Jowett and Goulding are open to similar criticism.

My experiments show, however, that when all the necessary precautions are taken corrosion does not take place. It seems to me, therefore, that the balance of evidence is decidedly in favour of the acid theory. In the paper already referred to, after quoting my statement "that the electrolytic theory of corrosion is untenable," Dr. Walker remarks that "if Dr. Friend's observation be correct, which the author does not admit—namely, that this small amount of carbonic acid is necessary to the solution of the iron—this fact does not contradict the electrolytic theory, but can best be explained, and in truth can be explained only, by the use of the electrolytic theory." It is clear that Dr. Walker fails to distinguish between "the electrolytic theory of corrosion" and what is generally understood by the "electrolytic theory" in its wider application. As we have already seen, the former is based on the assumption that water is ionised to a sufficient extent to cause the corrosion of iron in the presence of oxygen, even though no trace of acid is present. My conclusion is that an acid must be present. But I agree with Dr. Walker when he says that the acid theory of rusting is in harmony with the "electrolytic theory," where by that expression he refers to the theory as enunciated by Arrhenius in its widest sense. The criticism is thus seen to be based on a misunderstanding and falls to the ground.

It may be well to call attention at this juncture to the fact that the ionisation of water, which forms the base of the electrolytic theory of corrosion, is purely an assumption for which we have no definite proof. Kohlrausch showed many years ago that water offers the greater resistance to the passage of an electric current the more carefully it is purified. A limiting value can, however, be reached, below which the conductivity cannot be reduced. Kohlrausch and Heydweiller distilled water repeatedly in platinum vessels in vacuo, and determined the conductivity as soon as the water was condensed. At 18° C. the value was 0.0384×10 ohms per centimetre, from which we calculate the ionic concentration to be 0.78×10 gramme ions per litre. It is noteworthy that simple contact with air raised its conductivity tenfold in a very short time.

Now although this water was undoubtedly the purest which has ever been obtained, we have no proof that it was absolutely pure. Not a few chemists maintain that if absolutely pure water could be obtained, it would be found to be incapable of conducting an electric current—in other words, that it would be incapable of ionisation. Leduc has drawn attention to the extreme difficulty of removing every trace of dissolved gases from water by boiling, and a very few molecules of carbon dioxide would be ample to give to an absolutely non-conducting specimen of water the minute conductivity observed by Kohlrausch and Heydweiller; so that their results may simply be a measure of the extent to which the dissolved gases remain in solution under the special conditions of the experiments. If such is really the case, the electrolytic theory of corrosion becomes a myth, whereas the acid theory is unaffected by it.

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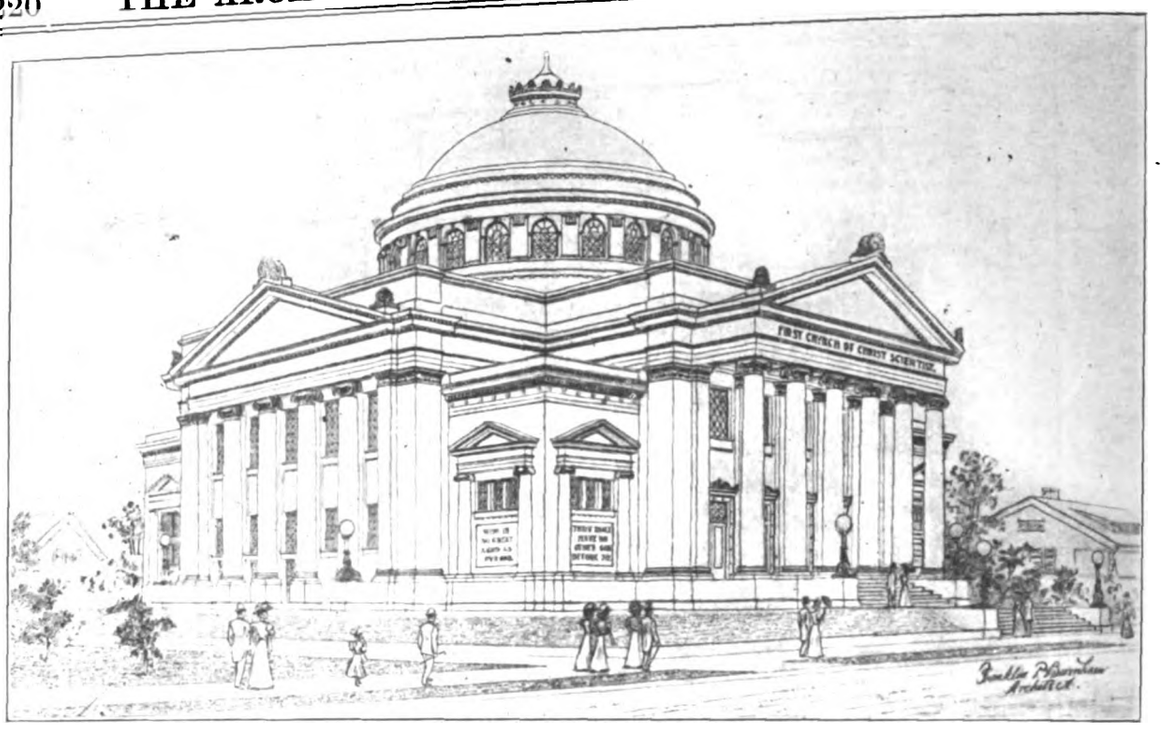


Fig. 4.—PERSPECTIVE VIEW OF CONCRETE CHURCH, PASADENA, CALIFORNIA.

In this connection I should like to draw attention to the fact that, whilst Dr. Walker's ferroxyl is undoubtedly a useful reagent when rightly used, no experiments with ferroxyl in actual contact with metallic iron can be quoted as deciding between the acid and electrolytic theories of corrosion, for its constituents are complex organic bodies which it is impossible to prepare in an absolutely neutral condition.

From the preceding remarks it will be clear that the whole question resolves itself into this:—Is pure water sufficiently active to effect the corrosion of pure iron in the presence of oxygen alone at ordinary temperatures, or is it not? Dr. Walker supplies the answer most decidedly in the affirmative, but my experiments lead me to an opposite conclusion. But either view is in harmony with the electrolytic theory of ionisation as we now know it, and the solution of the problem is one of theoretical rather than practical value.

ARTIFICIAL MAGNETIC OXIDE OF IRON.*

ONE more process, it would seem, must be added to the number of those that have had their inception in England, but which have been developed abroad. The Wülffing process, introduced from Germany, for the manufacture of a blue-black oxide of iron colour from ferrous liquors, of which an account was given to this Institute at the recent Vienna meeting, finds its parallel in a discovery of Dr. William Gregory which appears to have been lost sight of. It, however, in no way detracts from the merit of Dr. Wülffing nor from the value of the existing patents.

Gregory observed, that when a solution of protosulphate of iron is divided into two equal parts, one of which is peroxidised, then mixed with the other, and precipitated by ammonia at a boiling heat, a black oxide is obtained, which does not attract oxygen in drying, and is highly magnetic. Its composition, he continues, must be $2FeO + Fe_2O_3$; as the two solutions contain equal quantities of iron; and suggests that it may occur native as a variety of magnetic iron ore.

The above observation of Gregory's is not usually to be found in the small handbooks of chemistry excepting his own, wherein he has the following paragraph worthy of quotation in full:—

"*Magnetic Oxide of Iron.*—This oxide is the native magnet or loadstone, which is a heavy black mineral strongly attracting iron filings or steel. It is believed to be composed of protoxide and peroxide, and the native magnet is generally supposed to be $Fe_3O_4 = FeO + Fe_2O_3$. There is reason, however, to believe that another kind of magnetic oxide exists, which is $Fe_4O_5 = 2FeO + Fe_2O_3$. At all events, both of these compounds may be formed artificially, and both are magnetic as well as permanent, not absorbing oxygen or passing into peroxide. To prepare the former, take two parts of green vitriol; dissolve it in water and convert it into persulphate by boiling with nitric acid; then mix the solution with the solution of one part of the unaltered green vitriol, and precipitate the hot liquid by ammonia. A green precipitate falls which is to be washed and dried. The second magnetic oxide is prepared in the same way, only converting into persulphate one part of green vitriol instead of two parts. The precipitate is black if made in the liquid while hot. It is evident that in the latter case the quantity of iron, in the forms of protoxide and of peroxide, will be equal; in the former, the quantity of iron in the peroxide will be double that in the protoxide, so as to yield the above formulæ."

The paucity of information referred to may account for Gregory's observation not having found industrial application until recent years, and where the reaction is mentioned in one of the larger manuals it would rather deter one from attempting it on a big scale.

Thus it is stated that the hydrated magnetic oxide may be prepared by dividing an aqueous solution of sulphate of iron into three equal parts, peroxidising two of these with nitric acid, adding the other, and pouring the mixture, with frequent stirring, into an excess of solution of ammonia; if the operation were reversed, and the ammonia added to the mixture, the sesquioxide would be first precipitated, then the protoxide; so that a mixture and not a combination of the two would be obtained.

It will be noticed that this is quite opposite to the experience of Gregory, who adds the ammonia to the mixed liquors. But however the matter may be regarded the conditions of the Wülffing process have removed all doubt, for by the application of heat and pressure after precipitation, the desired combination is obtained, as is evident from the magnetic character of the product. A mere mixture of FeO and Fe_2O_3 would have no such property.

And here may be considered the fact that any of the black oxide obtained by this process is magnetic. The operation in actual practice is conducted by adding a portion of the ammonia to the ferrous liquor, which in Derby is the chloride, thus producing the lower hydrated oxide. By blowing air through the mass this lower oxide FeO is oxidised to the higher state Fe_2O_3. The rest of the ammonia is then added, sufficient to effect complete decomposition of the ferrous salt, and combination of the two oxides is brought about, as above stated, by means of heat and steam or air pressure, dehydration being at the same time effected.

It will be obvious that a mathematically exact division of

* A paper read at the autumn meeting of the Iron and Steel Institute, by F. J. R. Carulla, F.C.S. (Derby).

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the ammonia is practically impossible, as is also the exact peroxidation by means of air of the first precipitated portion of the oxide. The resulting final product will therefore contain different proportions of FeO and Fe_2O_3 in every charge, a matter, however, of no practical significance when the process has been got into fair working order, the differences then not being great. The fact nevertheless makes the name ferroso-ferric oxide a peculiarly appropriate one if Gmelin's definition is accepted for these bodies, viz., those oxides of iron which contain more oxygen than the protoxide and less than the sesquioxide in various proportions.

Nevertheless, there is ground for believing that, generally speaking, combination occurs only between FeO and Fe_2O_3 to form Fe_3O_4, and that any excess of Fe_2O_3 remains in admixture as such. The reason for this opinion is that it is possible to obtain a great variety of colours quite as one might expect from mixtures containing varying quantities of the black magnetic oxide and of the highly coloured ferric oxide, as is shown in the annexed table, which gives the results of analyses of the first fifteen charges of the magnetic oxide produced at Derby whilst apprenticeship to the process was being served.

Formulæ of Charges.

No. of Charge.	Ferroso-ferric Formula.		Magnetic Formula.		Proportion of Magnetic to Ferric Units.	Colour.
	FeO Units.	Fe_2O_3 Units.	Fe_3O_4 Units.	Fe_2O_3 Units.		
1	5	7	5	2	2·5	Black.
2	7	9	7	2	3·5	Black.
3	4	5	4	1	4·0	Black.
4	4	5	4	1	4·0	Blue black.
5	11	20	11	9	1·22	Brown.
6	7	10	7	3	2·33	Brown black.
7	7	10	7	3	2·33	Blue.
8	8	9	8	1	8·0	Blue black.
9	8	9	8	1	8·0	Black.
10	8	9	8	1	8·0	Black.
11	5	8	5	3	1·66	Green.
12	3	4	3	1	3·0	Brown black.
13	7	8	7	1	7·0	Black.
14	6	7	6	1	6·0	Greenish black.
15	3	4	3	1	3·0	Blue
Dr. W.'s	5	6	5	1	5·0	Blue black.

In the table the various values are derived from the proportion of ferric to ferrous oxide found in the different samples, columns 2 and 3 giving the ferroso-ferric formula; thus charge No. 1 would be $5FeO + 7Fe_2O_3$. It is obvious, however, that this formula can rapidly be transformed into the magnetic formula—that is to say, the one more likely to be correct—by simply taking the units of FeO as units of Fe_3O_4, subtracting these from the units of Fe_2O_3, and regarding this remainder as peroxide in admixture. These numbers are given in columns 4 and 5. This view seems to quite accord with the analyses of magnetites in Dr. Stutzer's valuable table.

Column 6 gives the proportion of magnetic to ferric units, and it will be seen by the last column that where the magnetic units largely preponderate the colour is usually a decided black. Where the ferric units approximate in number to the magnetic the change from black is very decided, as in Nos. 5 and 11.

The last sample in the table, marked Dr. Wülffing's is a normal product of the process.

It may be mentioned that although the variations obtained may militate against the colour, as a black, they in no way injure it as a protective medium for paint purposes, Fe_2O_3 being quite stable.

It is from this point of view—that is, from its possible instability—that Fe_4O_5 might be thought to be a less desirable body to aim for in the process than Fe_3O_4. It is easy to conceive of Fe_4O_5 as a tertiary product obtained by the combination of Fe_3O_4 with FeO, in which case the ferrous oxide might be more lightly held than is the case in Fe_3O_4. If this were the case decomposition would more readily set in with Fe_4O_5 than with Fe_3O_4.

This may well be, however, an erroneous conjecture, for it will be found that whereas some of the samples, for the purpose of analysis, dissolve in acid* with the greatest ease, now and then one comes across an intractable body most difficult of solution. May it not be that in this case Fe_4O_5 is the body so resistant to chemical action?

Charges Nos. 11 and 15 were of this character.

It may be well to recapitulate, and possibly make more clear, the points that it is desired to emphasise in the above remarks, although Dr. Wülffing worked out its industrial manufacture from waste liquors—no small merit.

Firstly, that to William Gregory of Edinburgh must be assigned the discovery of the artificial production of magnetic oxide of iron. Of this there can be no doubt, as what seems to be the earliest notice of it is found in a book of which Liebig was co-editor and Gregory gets full credit for it.

Secondly, that there are grounds for believing that magnetic oxide of iron made by the above process is either Fe_3O_4 or Fe_4O_5, and that any variation from these formulæ is due to admixture of Fe_2O_3.

Thirdly, that to say whether the main portion of any sample is Fe_3O_4 or Fe_4O_5 is not a matter that can be asserted with certainty, although there are indications that two distinct bodies exist in different samples, one of these being most difficult of solution. This is a matter well worthy the attention of some competent investigator to whom the subject may appeal. Fourthly, that notwithstanding those difficulties that all beginners are sure to encounter, the product is difficult to spoil in the making, except as regards colour, and the operator can soon attain to the production of a commercially uniform article.

Finally, it may be added that the protective character of this magnetic oxide of iron is most marked. Just as the Bower Barff coating and the film on Russian sheet iron, both magnetic, afford protection to iron surfaces, so does this product when laid on in the form of paint.

The action that takes place through the localisation of scale on iron plates must not be thought to militate against the use of a magnetic iron paint. It might as well be argued that because a hot ember will burn a hole in the flesh, therefore diffused warmth must also be harmful.

The great protective value of what one may be allowed to call the Gregory-Wülffing magnetic oxide of iron paint is acknowledged by all who have had any experience of it.

* 0·5 gram of the magnetic oxide is dropped into a nearly boiling hot mixture of 15 cubic centimetres oil of vitriol and 50 cubic centimetres distilled water.

THE BUDGET AND THE BUILDING TRADE.

THE following announcement to the public, being made by over thirty prominent members of the building and allied trades in South London and the suburbs, is being issued through the Budget Protest League as a result of the recent meeting, whereat it was decided to lay before the workmen who are in danger of being thrown out of employment, how seriously their interests are being affected by the Budget, and how still more seriously they are likely to be affected in the future. The announcement shows that over 2,600 out of some 4,900 workers have already been thrown out of employment through the effects of the Budget on the signed firms:—

"We, the undersigned, have been engaged for various periods, in some cases for a large number of years, in developing building estates in various parts of London and the suburbs, and we feel it to be our duty to direct the attention of the public to the grave crisis which threatens the workmen employed in our industry. Our experience is, we believe, typical of that of others in the trade.

"We, in normal times, employed in the aggregrate, directly and indirectly, about 4,944 workmen, clerks, draftsmen, &c., but since the end of May last, owing to the Budget proposals, a considerable reduction has been made, which, in the near future, will be added to.

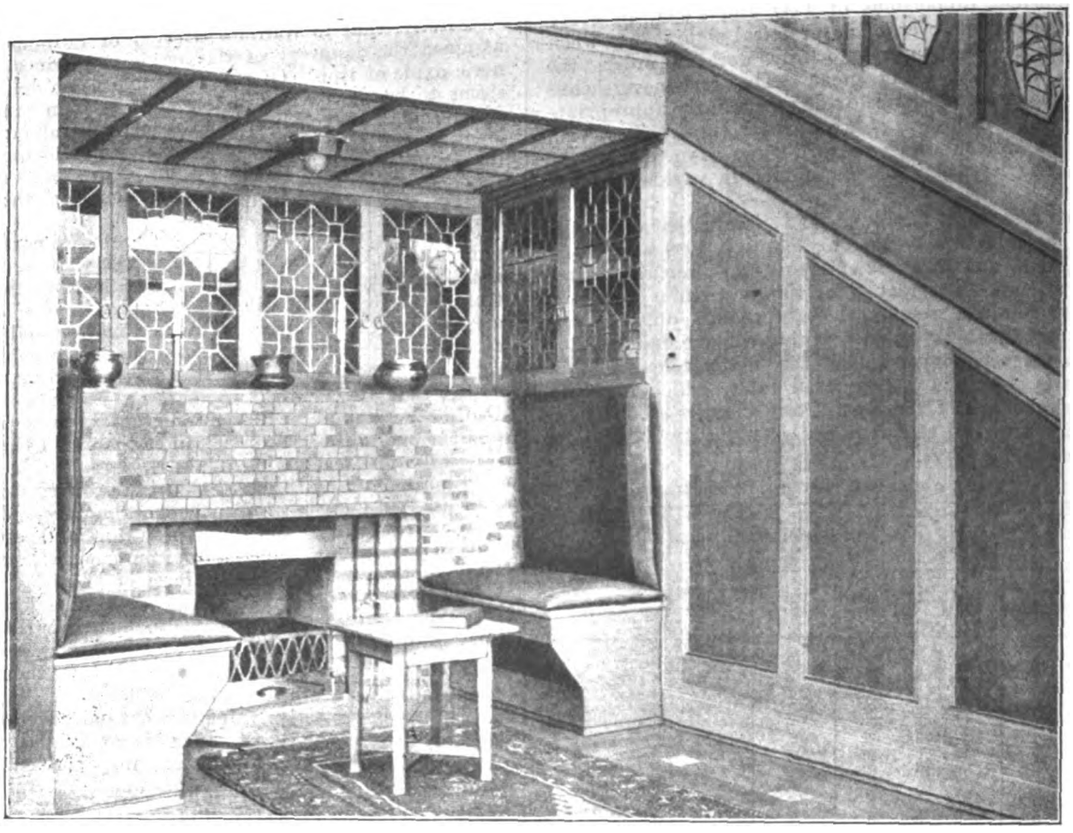
"It should be remembered that our position may be taken as being that of a vast majority of those who are similarly employed, and since the Budget proposals have been placed before the public no one of us has taken up any land for building purposes. The reason for this is that while we, as traders, are as desirous as ever we were to do business, we are unable to entertain proposals which could result in nothing but a serious loss.

"The increment duty of 20 per cent. and the 100 per cent. increase in stamp duties are, perhaps, the direct causes of the paralysis of our industry and the demoralisation of those who have been accustomed to invest their money in building. Beyond this the little man who buys a single house, frequently paying for it in instalments, will no longer dream of investing his savings, or committing himself financially, by dealing in house property.

"The actual result is that with an immediately diminishing number of workers we are merely completing existing contracts, and seeing that not one of us has bought a single estate since the Budget was introduced the outlook for the winter months, so far as the worker is concerned, is grave beyond any possibility of exaggeration. Meanwhile the average number of men we have employed up to May last number 4,944 and the number now is 2,309.

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



INGLE-NOOK UNDER STAIR IN COUNTRY HOUSE, LÜBECK.
Hermann Muthesius, Architect.
Fireplace in green and blue glazed brick; woodwork in unstained oak; cushions in blue leather.
(From *Dekorative Kunst.*)

"Our workers themselves are realising the position, and they will not be the only ones who will be thrown out of work. Draftsmen, accountants, correspondents, and office staff are in many cases greatly reduced now, but in the course of the next few weeks the majority will have to go.

"We desire to make our position perfectly clear. We are anxious to continue business, we are wishful of finding further work for our men, some of whom have been with us many years, but this is impossible, and we give this warning of the general collapse in the building trade in the hope that something may yet be done to avert what cannot but prove to be a terrible industrial calamity."

(Signed) Edwin Evans, surveyor, 253 Lavender Hill, S.W.
J. C. Hill, builder, 14 Archway Road, N.
C. Rawley Cross & Co., 76a Chancery Lane, W.C.
Howard & Lavarack, 17 The Parade, Golders Green.
Ernest Owers, West Hampstead, N.W.
Allen & Hoar, West Hampstead, N.W.
Henry Watts, 122 Mitcham Lane, Streatham.
James Wise, 20 Earlsfield Road, Wandsworth.
Swain & Selley, 31 Greyswood Street, Streatham.
Meech & Goodall, 1 Drewstead Road, Streatham Hill.
George Palmer, 190 Mellison Road, Tooting, S.W.
A. A. Wellings, surveyor, Earlsfield, Wandsworth, S.W.
Allen & Norris, Wandsworth Bridge Road, S.W.
A. Gosheron, "Westgate," Holmesdale Road, Thornton Heath.
William Hollis, Finchley, Hendon, and branches.
G. Arthur Gale, builder, Walham Green and Wimbledon.
W. A. Garnham, 7 Shrale Road, Streatham.

THE RATING AND TESTING OF BOILERS FOR HEATING INSTALLATIONS.*

A GOOD deal of thought has lately been bestowed on the question of standard ratings for low pressure heating boilers, and it has occurred to me that a few observations on the rating, some suggestions as to methods of testing boilers and the scientific considerations involved in this process might provoke some useful discussion.

A committee has been appointed by the Council of this Institution to report to the Institution on the steps which it is desirable to take, and the tests to make in order, if possible, to standardise the rating of boilers. The matter has also been engaging the attention of the American Society.

Now it behoves us to be very careful to inquire in what way such a report can be made most useful to heating engineers, and precisely what it is we wish to accomplish.

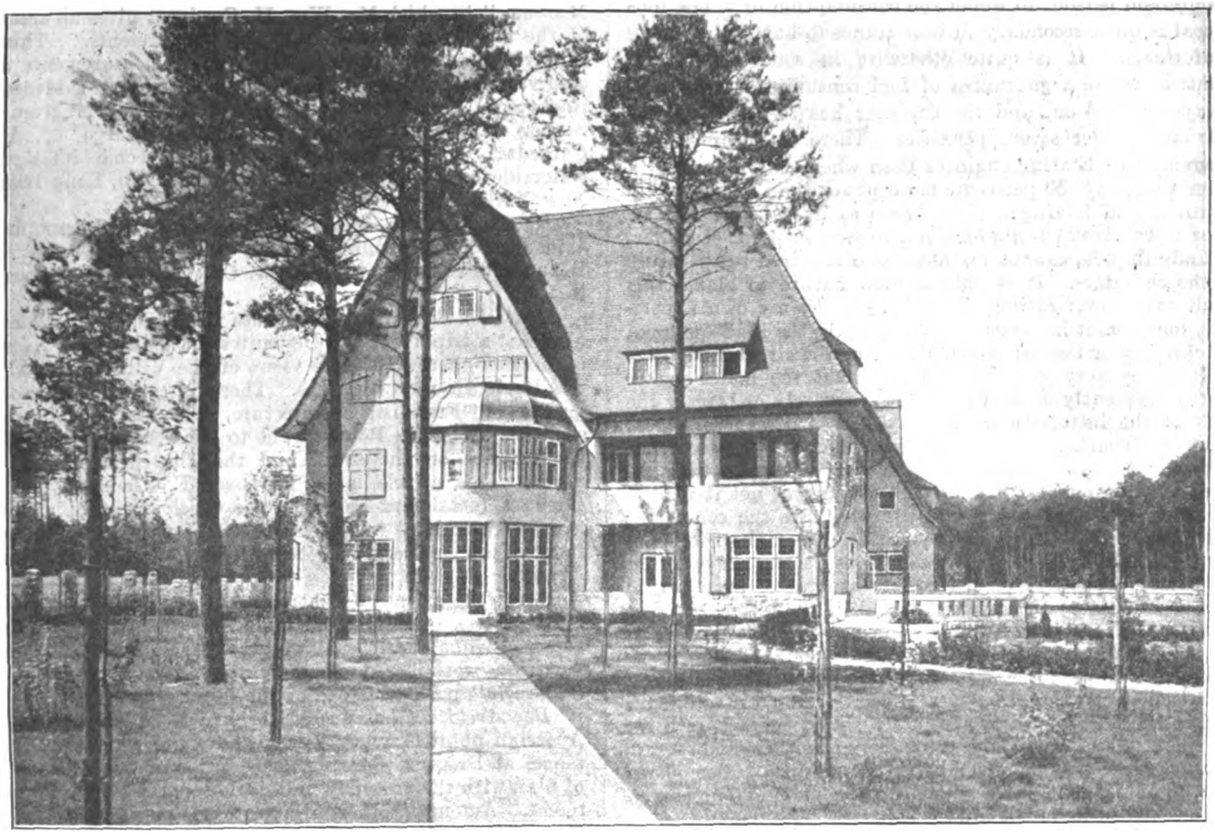
The primary object of the heating engineer is to satisfy his client, to put in a good job which will work well, and to get his money and make what little profit there is to be made out of heating with as little fuss as possible, and if the work of this committee does not help him to do this we might as well spare our time for something more useful.

Before, however, proceeding to the consideration of the purely technical considerations involved, it will be advisable to take a rapid review of some very practical questions—that is, to inquire, firstly, what the requirements are for a heating boiler from the point of view of the persons chiefly interested, viz. the client, the caretaker and the heating engineer, and how far experimental results which can possibly be obtained by any process of testing may be utilised to further the objects which we all have in view, viz. the improvement of the appliances used by the heating engineer so as to satisfy all reasonable requirements of the customer? Secondly, the facilitating of the acquirement of exact information as to the performances of these appliances by codifying information experimentally obtained from them in such a way that the ordinary busy heating engineer can be sure of getting pretty well what he wants without making the expensive and humiliating mistakes to which the absence of this exact information not infrequently leads.

* Abstract of a paper by A. H. Barker, read before the Institution of Heating and Ventilating Engineers at Manchester

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



A COUNTRY HOUSE AT ZEHLENDORF-WEST.
HERMANN MUTHESIUS, Architect.
From *Dekorative Kunst.*

Clients.—The general attitude of an ordinary client who puts in a heating installation in his own house, or in a public building, towards the installation is very simple. He wants to be kept warm without feeling stuffy, and he cares not at all how it is done, nor what the temperature is, so long as he feels comfortable, and provided he is not worried by complaints from the caretaker. Also he does not want the installation to be expensive in fuel, although generally he has the vaguest possible idea of what fuel it ought to burn, and does not wish it to take up much of the caretaker's time. That is to say his ideal boiler is one which has a good big fire-box which can be filled up with fuel, and which can then be left to burn itself out. Further, he does not want to be faced with heavy repair bills; in fact, he wants the boiler to be such that it never comes under his notice at all, either by breakdown, noise, smell, coldness of his radiators, and as little as possible in the shape of fuel and repairs. A client or customer never touches a boiler or a shovel with his own hands. He generally obtains his opinion of the boiler, firstly, from what his caretaker tells him about it; secondly, what it costs him in fuel and repairs; and thirdly, how much of the caretaker's time it occupies. That is to say, a boiler which is found unsatisfactory is often or generally condemned by the client on account of matters which have very little to do with the efficiency of the boiler itself. If, for instance, the boiler is fixed below his drawing-room, and the dust and noise of the stoke-hole cause annoyance, or if the chimney does not draw properly so that smoke finds its way into the rooms, or if the boiler is given more work than it can do, so that the radiators are not hot enough; if the fuel is wrong or the stoking bad and the attention indifferent, if the attendant cracks a section with the fire tool, or burns the fire bars by allowing ashes to accumulate, or if the fittings break off, or if he has to shut down several times to repair a leak, or if the installation is apt to boil over on slight provocation, the client is very apt to lay any or all of these defects to the charge of the boiler. If that boiler A were changed at any time for another and perhaps inferior boiler B, and at the same time the attendant were changed for a better one, it might happen that the client would get better results, and form the opinion that boiler B was a better boiler than A.

The Attendant.—The attendant forms his opinion of a boiler almost entirely from the amount of personal trouble it gives him. If it is easy to clinker and easy to clean and to stoke, and strongly made, and is well above its work, and the circulations are well arranged so that the radiators heat evenly, and he does not get into trouble by reason of some rooms being too hot and others too cold, and, above all, if he can fill it up with fuel and leave it alone for many hours, he is very apt to conclude and convince his employer that the boiler is good, even though it is frightfully extravagant in fuel and repairs.

It is evident then that no reliable indication of the excellence of a boiler can be obtained from the opinion that clients form of it. I have known clients to have a very high opinion of a boiler that I knew was extremely bad in every way in which a boiler can be bad.

I often think that a client's opinion of a boiler is formed more from the performance of the chimney and the good design of the circulations than from the qualities of the boiler itself.

The Heating Engineer.—The heating engineer's opinion is often based on grounds almost equally unscientific. He generally favours the cheapest boiler which will work up to its catalogued power without causing him trouble after it is put in, and which is destitute of features against which he has a theoretical prejudice.

A boiler which develops leaks or cracks (it may be from inferior nipples or other causes, or from being badly installed), or a boiler of light construction, of which the hinges are apt to get rusted away, or in which the doors warp and do not fit, or a boiler which gives rise to any complaint of any sort from the client whether well or ill-founded, but which results in an expensive journey to inspect it, is one which the heating engineer does not favour.

In this country at any rate the question of fuel consumption is a secondary matter as far as the heating engineer is concerned. He is not generally asked for a guarantee of fuel consumption, and if he is (if a wise man), he declines to give it on the ground that it depends on the efficiency of the stoking, or on our ever-changeable climate, which makes a satisfactory prolonged test impossible, and on countless other matters. We all know that the total fuel burnt in a winter

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may vary 50 per cent. or 100 per cent., according to the mildness or otherwise of the winter, and that in this country the man who has his house warmed by an apparatus is generally a well-to-do person, to whom the consumption of a few tons of coal is quite secondary in importance to having his house comfortable. It is quite otherwise in some continental countries where a guarantee of fuel consumption is almost always insisted on, and the engineer has to carry out the guarantee under severe penalties. There is nothing more annoying to a heating engineer than when, having put in a boiler with, say, 30 per cent. more power than is nominally required, and having perhaps done so at his own cost in order to be sure of being on the safe side in point of power, he finds that he cannot maintain the required temperature in the radiators. It is only human nature to blame this result to the over-rating of the boiler. In my own experience, however, it has been more frequently the inadequacy of the chimney or the bad arrangement of the circulations.

It is my very strong impression that the boiler maker is very frequently blamed for what is entirely or largely the fault of the installation. At any rate, whether this is so or not, the heating engineer is at present in the position that he does not know where he is. He does not know when he takes a boiler out of a maker's list whether or not it will do the work it is supposed to do, nor what are the conditions which will enable it to do the work. The maker does not generally tell him on what basis it is rated, nor whether the catalogue powers of the boilers are taken from actual tests or from mere measurements, and, if the latter, on what basis the rating is calculated, nor how the measurements are made, what parts of the boiler are calculated, how much is in contact with the fire, and how much receives direct radiation from the fire, how much is flue or secondary surface, nor how much is absolutely out of contact with the hot gases altogether. The consequence is that in order to be on the safe side he is compelled to put in a boiler 30 per cent. to 50 per cent. more powerful than should be necessary, and even then he is not always safe.

The Boiler Maker.—It is easy to understand the maker's attitude. He does not wish to disclose his method of rating for fear of his rivals, or for fear his competitors will "go one better." It is quite certain that makers will not consent, in the absence of some definite understanding on the subject, to rate their boilers at less than the maximum which they think obtainable. The question therefore arises how far it is possible or desirable to induce boiler makers to consent to a uniform system of rating, on the basis of actual heating surface.

It is obvious that it will be very difficult. Some boiler makers uphold a claim that their particular arrangement of heating surface ensures better transmission and more efficient utilisation of the heat generated in the furnace than the arrangement of their competitors, and they would not consent to be rated on the same basis as a competitor whose design they consider inferior. Also, if a maker has been to considerable expense in making tests and secured certain experimental results from his boilers, he will not consent to rate them at a lower figure merely because a committee of this Institution has decreed that a lower rating is desirable. Again, if a manufacturer has been rating his boilers according to a tradition of his firm, or according to Hood's formula or some similar basis, to alter his rating makes an apparent increase in his catalogue price, which he may think is bad for his business.

Roughly speaking, what heating engineers would probably wish to get from this committee is something of this kind. They wish it to examine, measure or test, either themselves or by proxy, the existing boilers now on the market, and inform them whether or not they are fairly rated, and, if not, what, in their opinion, the rating should be for each boiler of each maker, or perhaps to obtain an undertaking from the maker that he will give the rating according to a standard, presumably to be agreed upon in accordance with the results of certain experiments to be initiated or recommended by your committee.

The broad result is to be that after it is done the heating engineer is to be certain that if his job is, say, 2,000 square feet, then if he puts in a boiler rated on the standard basis as 2,000 square feet, the boiler will actually heat that 2,000 square feet up to the specified temperature. A standard rating is of no use whatever unless it can be absolutely relied on, so that an engineer who puts in a boiler of the proper calculated size, if it will not do its proper duty, may know at any rate that this is not the fault of the boiler.

(To be concluded.)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* contains a further article on "The Architectural Exhibition at the Brooklyn Museum," in which Mr. Wm. H. Goodyear gives an account of the origin of the research that it represents. This is chiefly concerned with Mr. Goodyear's measurements and observations at Pisa, as to which confirmatory evidence of intentional departure from the normal lines is given by Signor Annibale Messini, architect-in-charge of Pisa Cathedral. Illustrations are given of some interesting waterside houses at "Bayberry Point," Islip, Long Island, New York.

La Construction Moderne gives us a typical example of a modern French country house, "Les Quatre Vents," at Beaumont-sur-Oise, of which M. Ch. Langlois is the architect.

Deutsche Bauzeitung continues the account of Professor Manchot's trip from the Dolomites to Venice, and gives in connection therewith some views of the Villa Maser, which the Professor now describes. There is commenced also an article on Frankish architecture, the district of which stretches from the Böhmerwald to the Rhine, and touches the Danube on the south and the Thüringerwald on the north. This article is by Professor F. Ehemann, and in the first instalment he traces the development of architecture in Frankland to the year 1190, illustrating with views from Wurzburg and the monasteries of Bronnbach and Ebrach.

Architekten und Baumeister Zeitung illustrates an extensive block of residential and office premises in Dapontegasse, Vienna, which is an excellent example of modern Austrian work based on the national development of the "Barock" period instead of the latest "new art."

Der Architekt has an article on village schools from an Austrian point of view, as an example of which is shown a school at Bregenz, showing an adoption of the corridor type of plan with the assembly hall quite separated from the class rooms. Amongst other illustrations are a new "Kuranstalt" at Semmering, a suburban house in Vienna, and some views of old work.

The *Engineering Record* has an article giving the results of a series of tests of the bond between steel and concrete made in the laboratory of the Civil Engineering Department of the University of Pennsylvania by and under the direction of H. C. Berry, assistant professor of materials of construction. A valuable article on the design of retaining walls gives the main features of a report by the committee on masonry of the American Railway Engineering and Maintenance of Way Association. Of architectural interest is an account of the construction of the Metropolitan Life building at San Francisco, a building 80 feet by 80 feet and 54½ feet high above ground, in which reinforced concrete is cased with terra-cotta and faience.

GENERAL.

St. Bartholomew the Great, West Smithfield, will be shown and its history explained on Saturdays, October 9 and 16, at 3 P.M. The crypt, cloisters and other portions of the church will be thrown open free of all charge, but a collection will be made for the debt on the restoration.

The Local Government Board have declined to alter their refusal to an application made by the Southampton authorities for a loan of 700*l.* for the purchase of a collection of paintings showing local subjects.

The Lincoln Guardians on Tuesday resolved to employ an architect to prepare plans for a receiving home to be erected on a site just purchased at the corner of Long Leys Road and Mill Road.

The Lancashire Education Committee propose to expend 1,000*l.* on a temporary increase of the county architect's staff to enable him to cope with the higher education scheme. The extension or erection of twenty secondary and technical schools is contemplated.

A Movement of a serious nature has been reported in the north-west pier of the tower of the Abbey Church at Hexham, and examination revealed rather an alarming state of affairs. The clustered pillars forming the east side of the pier in the transepts were found to be considerably out of the perpendicular. It is understood that a report will be presented to the Abbey restoration committee.

Wedham Church, Essex, which has been undergoing extensive restoration, at a total cost of 2,500*l.*, under the superintendence of Mr. T. G. Jackson, R.A., was re-opened on Wednesday.

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The Architect.

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FORTHCOMING EVENTS.

Friday, October 8.

Architectural Association: Annual General Meeting. President's Address and distribution of prizes.

Saturday, October 9.

Institution of County and Municipal Engineers: Home District Meeting at Winchester.

Northern Architectural Association Meeting at Newcastle: Visit to Scotswood Council Schools (Messrs. Fenwicke, Watson & Curry, architects), and Denton Hall (1622).

Monday, October 11.

Bristol Society of Architects: A Lecture on "Town Planning" at the Fine Arts Academy, Clifton, by Mr. Raymond Unwin.

Tuesday, October 12.

University Extension Guild: A Lecture at the British Museum on "Egyptian Architecture," by Mr. Banister Fletcher, F.R.I.B.A.

Wednesday, October 13.

Manchester Society of Architects: First Sessional Meeting. Presidential Address by Mr. P. S. Worthington, M.A., F.R.I.B.A.

Association of Engineers-in-Charge: Presidential Address by Professor Henry Adams, M.I.C.E., &c., at St. Bride's Institute.

Thursday, October 14.

Society of Architects: Twenty-fifth Annual General Meeting.

Institute of Metals: Autumn Meeting in Manchester, Oct. 14 and 15.

TEXTURE.

THERE are few points in which the architecture of the present day is more remarkable than in the development of texture, and the realisation of what a powerful element in expression lies in the hands of an artist who studies carefully the effect of the variations of texture by which the plain wall may be made as integral a portion of the architect's design as grouping and proportion, moulding and carving, arch and pillar. We will not go so far as to say that texture of wall surface is of primary importance, or even of equal importance with the other elements of architectural design; but, in a perfect building, texture should bear the impress of the artist's handling, and aid in the production of a complete entity, harmonious in all respects.

No doubt in every building accidental play of light and shade, accidental effects of weather and time, affect the ultimate appearance, and the generally greater charm of an old building over a new one is largely due to accidental modifications of the original surface and colouring.

This, however, is not sufficient justification for attempting, as has been done in the past, to eliminate all effects of texture by the production of as nearly as possible uniform surface with the help of Bath stone or Fareham brick, of paint or whitewash or stucco, so as to leave everything clear for accidental modification.

Many means there are for obtaining texture, the play of light and shade, in wall surfaces. The present rage for rough-cast is one of the symptoms of the desire for texture, and this material has not attained its present almost overwhelming popularity entirely from the practical point that it is a cheap way of making thin walls weather-proof. The value of weather-worn old bricks and tiles has been recognised for many years by genuine artistic architects who have felt impelled to depart from the monotonous effect of Fareham red bricks or Cowley stocks, admirable as these are in their own particular direction.

Though not by any means a pioneer, there are few living architects probably who have made more attempts and experiments in texture than Mr. Edwin L. Lutyens, who has been fortunate in finding clients to allow him to experiment with many varied treatments. Chalk, stone, tile, and many specially manufactured varieties of brick have all been employed by this architect, either singly or in varied combinations, to an extent that has perhaps seemed mere fad, but is rather a keen recognition of the infinite amplitude of the effects obtainable in texture by the employment of suitable material.

Part of the effect that material plays in the production of texture is due to variation of colour as well as of form, of the value of varied tones rather than of related or opposed tinctures. Thus the question of texture, though strictly and correctly applied to play of light and shade only, is scarcely separable from the question of colour.

Amongst our illustrations this week are shown two remarkable examples of new buildings in London in which considerations of texture in its widest aspect of surface treatment have been allowed full play, the buildings for two of our insurance companies, the Royal and the Norwich Union, that occupy the prominent positions on opposite corner sites at the junction of St. James's Street and Piccadilly.

In the Royal Insurance building, designed by Mr. John Belcher, R.A., we have an example of the use as a building stone of Pentelikon marble; in the Norwich Union premises, of which Messrs. Ernest Runtz & Ford are the architects, we find Pentelikon marble on a base of jasper, a bold and striking innovation.

Pentelikon marble has only of late years become a possible building stone for British architects by the redevelopment of the marble quarries from which the ancient Greeks derived some of their best material. It possesses a peculiar texture of its own, unapproached by any other marble, and hence quite distinctive. The quality supplied for buildings is not, as is sometimes erroneously supposed, a pure white marble, but contains a subtle tint of variable tone and a certain play of colour that seems to us to become emphasised by atmospheric influences on veins of abnormal composition. These are the more pronounced in the Royal Insurance building, where the material has been longer in position. It might be questioned whether the development of vein markings by the atmosphere does not portend ultimate decay, and the use of Pentelikon marble as a building stone suitable or otherwise for London will very largely depend on the results open to all observers of its employment in these two prominent buildings. The use of a building stone containing a large proportion of calcium carbonate in London or any other large town whose atmosphere is highly charged with the products of coal combustion is, of course, an experiment, and we shall all watch with interest and close attention the use of Pentelikon marble on the same plane, as regards durability, that is occupied by Portland stone. A beautiful material of charming texture Pentelikon must be admitted to be; whether it is also durable is a question time alone will answer.

In the Norwich Union building Messrs. Ernest Runtz & Ford have made a still bolder experiment by the employment, in a building of so great importance and in so prominent a position, of a hitherto practically

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unknown material, Welsh jasper. The architects can scarcely, however, be charged with undue confidence when we know that jasper contains 93.57 per cent. of pure silica. There is a probability, therefore, of its extreme durability. Of the beauty of the new material there can be no question. With a remarkable range of colour and the appearance as regards texture of a fine marble it at once takes high position as a decorative building material. Distinctly different in composition and structure from a true marble it is clearly far superior in strength and in probable durability. The quarries in North Wales from which jasper is obtained yield a great variety of beautiful stone. That used in the Norwich Union building is known as heliotrope, but besides this there are produced green, buff, yellow, and deep maroon red. Thus we have now at our command a material equal to marble in colour, in polish, in texture, but of certainly vastly superior durability and employable for external work where one would not dare to use any ordinary or true marble of equal beauty in appearance.

COMPETITION FOR TECHNICAL AND SECONDARY SCHOOL AT WORKINGTON.

THE particulars for this competition are not altogether satisfactory, for in regard to the selection of the best design it is stated:—"It is the intention of the committee to entrust the work to the author of the design selected as the best, subject to the approval of the plans by the Board of Education, but the committee do not bind themselves to accept any of the plans submitted, and they reserve the right to alter or adapt the accepted plans in any way they consider necessary. The committee also reserve the right to call in expert assistance in the judging of the plans sent in." "No premium will be given."

The school is to be for 300 pupils of both sexes, and is to combine, to some extent, the functions of a secondary day school with those of a technical institute. There will be required chemical and physical laboratories, steam and applied mechanics laboratory, metal workshop and metallurgical room, woodwork room, art room, cookery room, laundry room, dining room for sixty, besides twelve class rooms, assembly hall, and other usual adjuncts of a secondary school. Provision has also to be made for evening classes for adults.

No limit of cost is stated, but an estimate based on cubing is to be sent in by each competitor. The drawings required are block plan to 20 feet scale, plan of each floor, at least two sections and four elevations to one-eighth scale, and the drawings have to be sent in not later than November 30.

The site comprises three acres, with a frontage of 250 feet to the north-west, and is of irregular trapezium shape and has very uneven variations of level, the difference between the highest and lowest points on the site being about 14 feet and the fall, on something like a hanging level, is about one in twenty. No sewers are shown on the block plan, nor any particulars of water, gas, or electric current supply, or of the nature of the soil.

"The curriculum will necessitate to a considerable extent the separate instruction of boys and girls," but no figures are given of the relative proportion of the sexes to be expected in this instance. Thus there is a good deal of additional information needed by competitors, the obtaining of which will still further reduce the limited time for preparing drawings.

NOTES AND COMMENTS.

THE annual exhibition of the Royal Photographic Society of Great Britain, being as it is the evidence of what is possible in the most able hands of the making of pictures by the aid of photography, is not the place in which we may expect to find a collection of records of architectural work, such as most of the photographs taken by architects are likely to be. But for examples of architecture as an element of beauty in pictorial design the exhibition is quite well worth visiting, if only for impressing upon architects the part that environment plays in the making or marring of a building as a work of art, or in other words the care that should be taken by every architect in designing a building so that it may fit its environment, quite as much as that it should possess

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merit of light and shade, of contour and mass. To see how a pictorialist in photography renders a building should be a grand corrective to the architectural designer who is given to laying too much emphasis on detail.

Amongst the pictures in which architecture forms part of the subject is "The Pillars of St. Mark," by John M. Knapp, a charming study of the play of light. Similarly this is the principal theme of the Norman cathedral study, "A Gleam of Sunshine," by S. G. Kimber, F.R.P.S. In "St. James's Street, Lincoln," by Bertram Cox, "St. Nicholas, Amsterdam," by William Davenport, and the striking picture, "Cathedral of St. Ouen," by T. Arnold Bennett, we have instances in which the architecture of the main subject forms a picture with its environment. So, too, with the street and canal "In Amsterdam," by F. J. Mortimer, F.R.P.S., with the new town hall of Belfast showing "In the Grey of the Dawn," by Tom Crabtree, with the tops of the cathedral spires in "A Street in Chartres," by Mrs. M. E. A. Powles. On the other hand, in the Italian mountain town of "Antraigues," by James A. Sinclair, F.R.P.S., and the "Burgtor, Rothenburg O. T," by John H. Gear, F.R.P.S., the architecture is the chief thing. The architectural visitor to the exhibition should not miss seeing the series of twelve old London doorways of the late Renaissance period, classified according to the principles of architectural design, by Walter Plomer Young, F.R.P.S.

Some might suppose or say that it is impossible to teach drawing by means of a book, but Ruskin was evidently not of that opinion when he wrote and published his "Elements of Drawing," and, after all, there is so little a teacher can impart by word of mouth to the embryo draughtsman that that little can as well be put into a book. The ability to draw rests so largely with the person who draws that the essential principles on which drawing is founded can very well be expressed *in print*, and may thus be even more readily grasped than *the spoken word*. Hence the appearance of a little book * which puts clearly before a novice those principles or, as the author calls them, "tricks of the trade" is well worthy of notice, particularly as the essentials of drawing are therein well explained. Both Ruskin and Huxley were agreed upon one point—that everyone can learn to draw, some more readily than others, no doubt, as with every other department of knowledge, but all with benefit to their powers of accurate observation and expression.

Mr. Boddington is justified in the sub-title he has adopted, for there can be no question that with the help of his little manual anyone can acquire the power of drawing "freehand self-taught." The method our author follows is admirable—first, the recognition in anything that is to be drawn of the three simple elements, Position, Proportion, and Construction. The means of embodying these elements are well advised. Then comes the question of Relief, the power of seeing in planes and expressing the three dimensions of all solids on a flat surface of two dimensions. This involves and necessitates the use of shading, the first principles of which are lucidly explained.

Admirable are the principles on which Mr. Boddington lays the greatest stress. The necessity for "seeing big," for accentuating vital points and general characteristics. Simplification and the relegation of minor details to their proper subordinate position. Practice as the panacea for all the evils of inexperience and inefficiency of the novice, and the attainment of the power of observing accurately and recording correctly which constitutes, after all, the whole of draughtsmanship.

* *The Drawing Book; or, Freehand Self Taught.* By P. E. Boddington. (London.: Winsor & Newton. 1s.)

The most interesting item to us in the eighty-seventh report of the Commissioners of His Majesty's Woods, Forests, and Land Revenues, is the account of the works undertaken during the year 1908-09 for the preservation of the structure of Tintern Abbey. The resetting of the eastern arch of the tower has been completed satisfactorily—the covering of the tops of all four walls of the tower and of the springers of the groins has also been done in a thoroughly sound and permanent manner so as to exclude water, and has been so arranged as to be unobjectionable in appearance—the walls and arches themselves from this covering down to the springing of the arches have been repaired and pointed on both sides. The utmost care has been taken to preserve all the old features, and to do nothing further than was absolutely necessary for the preservation of the structure, and it is very gratifying to be able to state that no accident has occurred to any of the workmen, although the whole undertaking was of a very difficult and dangerous character. The necessity of these works lies in the fact that last year 17,914 visitors to Tintern would have been exposed to imminent danger from the fall of the great arch and loose stones on the top of the wall which might have occurred at any moment. There have also been carried out repairs to the walls of the kitchen, the Lay Brothers' quarters, and the Frater, securing the tops with cement and turfing them, and some excavations at the Infirmary.

The position of the Crown as a holder of landed property is shown by the fact that, exclusive of land let for building purposes, foreshores and mineral rights, the Crown property under the charge of the Commissioners of His Majesty's Woods, Forests, and Land Revenues extends to about 319,213 acres, of which about 66,688 acres are under timber and 128,117 acres are unenclosed wastes subject to common rights. The School of Forestry has progressed satisfactorily, and a sixth class of eight students has been admitted. Since the school was started twenty-six students have obtained a full certificate, and sixteen students are now in the school.

Mr. Arthur Crow, District Surveyor for Whitechapel, Spitalfields, Mile End New Town and Tower Liberty, offers his contribution to the solution of the housing problem for London in a pamphlet (reprinted from *The Architects' Law Reports and Review*) entitled "Housing and Town Replanning," advocating the formation of a main artery about ten miles long, in the form of a double avenue with central boulevard running nearly east and west, and traversing the County of London from a point near the iron bridge over the Lea at Canning Town to the Uxbridge and Hounslow Roads, which unite at Shepherd's Bush Green. A branch road at Paddington is also provided leading to the Harrow Road.

Thus the tramway systems of the West Ham and East Ham Corporations in the east are to be linked with those of the Middlesex County Council in the Harrow Road and the London United Tramways at Shepherd's Bush in the west; for it is an essential feature of Mr. Crow's boulevard, which is to be 225 feet wide, of which 75 feet on each side is roadway, that double lines of tramways on the surface are to be run in each roadway, with a service of sub-surface trams for express travelling on one side. The Steine Gardens, Brighton, are used as illustrations of the effect of the boulevard, and the scheme is undoubtedly a fine piece of Haussmannising, but Mr. Crow does not claim that it is commercially sound, nor does he attempt to estimate even approximately the number of million pounds sterling that it would cost, and until this is done who can say whether London can afford it, even granting that the hygienic advantages would be great? Kingsway and Aldwych still represent a huge amount of unproductive capital, the loan interest on which is a millstone round the neck of the London ratepayer; so that for the present, at any rate, Mr. Crow's idea cannot be regarded as otherwise than Utopian.

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ARCHITECTURE: ITS TRUE PRINCIPLES.—XX.

By R. Owen Allsop.

Mass Balance.

We must institute some principle of arranging masses in the place of universal equal-sidedness. We should employ "symmetry" in its dictionary sense—the due proportioning of the several parts of a body to each other. This opens up scope for any amount of skill and study in composition. In place of the "art" of the turner and that of the potter, we then have one requiring the most lively and deductive reasoning. We can now easily give an impress of strong and, possibly, unique character to a work. The danger is the loss of unity. Pure, equal-sided symmetry, always assuming or indicating a centre, makes for unity in an automatic manner. In what way can we be best protected against the loss of oneness in asymmetrical composition? We have suggested—and it will probably be accepted by the reader—that parallelism, and rectangular relation, in masses, of itself alone, ensures a mind-appreciated bond, where none may appear to the eye. Extension of axis is plainly a principle—the lady-chapel at one with the nave and choir. That which is closely connected physically is most at one, so that compactness where not injurious to the actual service may be considered a rule. Skilful joining, the avoidance above all of ugly gashes in outline, or senseless breaks and set-backs in the main masses are, or should be, self-evident rules. We see, however, a very frequent ignoring of this rule in the case of acute-angle, main plans, as at the junction of streets, a position that absolutely demands either a prominent corner mass or a bold sweep of lines from the side planes right round the curved, or otherwise arranged, corner.

Anything the direct opposite to the modern rambling architecture as homes, hospitals, and the like, will be correct. It must be remembered that we talk sometimes of a "building," where village or town would be a more suitable term. There can be no grand oneness of effect in a mere assembly of individual units even if they all serve one practical end. The wards, service-block, infirmary and other members of the modern institution, facing about in different ways, at varying angles, cannot be arranged into any harmony except in a negative sense—that no member of the group shall be specially obtrusive. Compactness, then, is a first essential in irregular composition—the accurate, well-defined junction, the all-embracing outline, the management above all of roof masses. Unfortunately steel framings falsify the construction—upset the due relation between plan and mass. It is a frequent saying among architects that you can do anything with steelwork—the real meaning being that if you have a fancy for a heavy load over a gaping void, the steel girder can accommodate you fully. Herein is the worst feature of modern architecture, the want of correlation between plan and mass—a thing that never occurred in days of the architecture we now all admire. Every solid mass that appears in the composition must have its corresponding indication—its cause—on the plan, otherwise the whole affair is a sham, as much so as any built-up theatrical scenery. We must at times fall back upon the law of *the sufficient reason* for explaining why the asymmetrical architectural composition may be as pleasing as the purely symmetrical. We see it and must be satisfied. But to practically design to insure against mere patchwork, loss of unity, ugly breaks and gashes, and inconsistency, we must consider the subject relative to simplicity—*i.e.*, naturalness—doing what we want, if right and required, whether or not done before; and remember also the value of the axis and its plane of symmetry, correlation by definite angle, and the great law of balance of parts. We have seen how mere size of parts must always render that feature which is the greatest in cubical contents dominant of smaller masses. This is in accord with natural law. We have suggested—and the point is quite apparent and equally founded on natural laws or natural tendency of the eye (or of the mental eye as a reflex action) that this question of domination of the greater mass can be completely upset by certain relative placing of features, and, on investigating the cause, concluded that in all cases the wings, either as servants or guardians, must refer to the centre. Hence we can always enhance a part of a composition by flanking it. Therefore, if we have any weakly subordinate mass distant from the natural centre of a design, we can, by arranging it in suitable wings, greatly enhance its importance. This can be done to any extent, and is done, even if unknowingly, every time a composition of three things—it matters little what—are arranged on an elevation. In a similar manner we can generally on this principle bind together an otherwise dissolute portion of a design—by creating a centre to which two parts refer. Unity, we may see brought about—the design "pulled together"—by a pair of turrets. What was a weak mass, may, by the addition of flanks, be given just that extra dignity required, and explain also that unity is intended. So in a larger affair of several towers, these can be disposed, not necessarily to direct attention to themselves, but to lead the axis-seeking eye to some especial point.

The great extent to which this principle of centralising a feature, or the artificial creation of a centre or axis, influences effect in geometrical design is only appreciated if the inquiry and study be made. It is the secret of the effectiveness of alternation. The window between buttresses is by the buttresses enhanced. The alternate design principle of the egg-and-tongue and other like enrichments may be instanced. Here, the small ornament is flanked by the two larger, and the larger by the two smaller; so that on whichever object the eye rests it is sensible of bi-symmetrical design. Each ornament thus is enhanced in value by its adjoining ornament, and the effect is *plus* and irrespective of the principles of contrast and gradation evidenced in the general design of this universally-admired enrichment.

That which is flanked by equal-distant, equal-value wings should be worthy of its position, or should (as in the gable between western towers) mark out a worthy object—the great nave. Two large objects placed as wings to a small one over an insignificant centre of an extensive façade is bad composition. The reason is clear: we are —perforce unwittingly—led to a centre point between the flanks, and feel disgust at the meanness we there discover. Hence, in a plan composed of a long building needing, practically, a tower-like structure at one end, and without any important centre, it would be preferable to have a quite unbalanced façade rather than to create an artificial centre.

In general massing the avoidance of ugly gashes is a great thing. That which differentiates one building from another is a more or less pronounced vertical slot, gap or depression, not of itself beautiful. The object being to render a group—in its multitudinous features—as one mass, this appearance of divisional cut is to be greatly avoided. Especially will broken roof-lines, creating a V-shaped depression, break up and annul any unity of effect. Hence the importance of good roof-lines and the need of study and care in roof junctions. A common eyesore in house building of the "parasitically sublime" order is the odd piece of roof breaking down on to some other ridge-line. This is more especially offensive where the more elevated roof-line is that plainly subordinate to the main roof. The ugly gap in the centre of Antwerp Cathedral must be familiar to all, and matters are not improved by the onion-shaped flèche, both strikingly out of harmony with the beautiful tower. Nothing is more satisfactory than a consistent line of roofs over all main parts, and if this cannot be accomplished, then a secondary tower roof-line, embracing in its turn as much as possible. Consistent roof "pitches," based on the fundamental principle of the true proportion—the similitude of ratios—is a very evident working principle in architectural design. That which gives added effect to the Egyptian pyramids as a group is their apparent (or real) constant ratio of base-line to axis. The effect of unity is enhanced, and this would disappear where the several pyramids not true proportionals. Much can be learnt in the prime essentials of composition from these objects. The varied size makes for oneness *in the group*—contrary to what might be

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thought by those who have not reasoned as to the matter. Three equal objects, each of equal weight and volume, would have equal value and equal effect, so breaking up the idea into that of individual self-assertiveness. The individual should have his value and not be swamped by the architectural community; but short of this the reference must be to the whole interest. From this consideration, evidenced in all fine widely asymmetrical works of architecture, we arrive at the general conclusion that there must be in a composition much wanting in the symmetry of halves, a greatly dominant object, and a general scale of gradation. The reasoning here must be understood to apply to large works where practical service renders necessary a great number of separate parts. In such a case, supposing general and pronounced (by necessity) asymmetry in the plan, the composition may include one dominant, several subdominant, and many minor plainly subordinate features. This consideration emphasises the value of simplicity—and its *power* and sweet reasonableness. For, naturally, the building, as a practical man-serving construction, has diverse parts of varying uses, and yet, as each in its way is important and necessary, it is but straightforward common sense to let each be shown in a natural, unaffected manner. It is evidently the reverse process to that of packing up a medley of rooms into the form of an ancient temple. A superficial examination of this point might lead to the supposition that the showing (plainly) of relative unimportant and humble parts (instead of "boxing them up" into larger units) would result in incongruity and loss of dignity. Our really progressive domestic architecture shows that this is not the case. Ancient examples confirm the opinion.

In what way then do these last-expressed sentiments agree with the anathematising of patchwork? The essential attribute of true "patched" architecture is the absence of



Fig. 42.

thought in the plan—and, indeed, in everything else. The most irregularly-disposed building must show the effect of the brain mastering the plan, and the group arising therefrom will indicate the skill with which this plan has been made. We have argued that a fine building requires a fine site—sufficient ground, at any rate, and that to compare cramped-site architecture and that on broad areas is to compare a self-reliant man, able to work his arms and legs, to a person wedged into, and wholly dominated by, a crowd.

We have suggested that it is in the asymmetrical design that we have scope for—and see all round evidence of—true character and strong personality. In every building having a dome-capped transept and western towers we shall see some echo, or imagine we see some points corresponding to St. Paul's. If, instead, we have a dome, one large tower and minor turrets, we make for individuality—the scope is greater for variation of type. There is more opportunity for that rearrangement of parts that affords us a chance for new combinations—for what is called "originality" and what is called novelty. Let us, therefore, without trespassing against the fundamental necessity for symmetry of halves, strive to cast off, as a disease, that unwholesome forced bi-symmetrical tendency that destroys our best and noblest instincts and aspirations architectural. Let us well ground ourselves, practise and study the art of grouping with balance, such as the tree, by nature, does for itself, and the artist but humbly imitates.

The true balance of asymmetrical massing cannot be accomplished by the mere elevationist. The effect of all disposition on elevation is upset in perspective. The great interest of all objects, large or small, of geometric form—indeed of any form having length, breadth and depth, is similar to that of a cut diamond—it has new interest from every varying standpoint. How great then is the circumspection required for arranging so that from all points there may be balance and no jarring sense of one-sidedness—leaving the mind with a sense of something wanted—some injustice, even if only to the eye. In nature the fact of passing strangeness is the harmonious balance whereby mountain, forest, tree, sky and cloud, sunshine and shadow at all points leave on our minds an impression of balance—that is a fair distribution of interest about the whole view afforded. It may be questioned if there is such a thing as a discord in inorganic and plant life—excepting such as man drives into its domain.

Can we learn nothing from this applicable to asymmetrical geometrical form arrangement? The sinking of all sham—comprising in that deceptive purpose, trick, mean artifice, "subtlety" and affectation—we see that all that is true and of utility if it has no positive beauty, has no offensive ugliness. We may say that the giraffe's neck is less beautiful than man's neck, or than the swan's neck; but it would require boldness indeed to affirm that it was ugly. The designer then need have little compunction in arranging *any* form irrespective of the exact symmetry of halves, so long as it is the result of right reasoning, the subject of regular and geometric form and impressed with the attributes of grace and beauty according to his lights. The architect need not stop to ask whether such and such an arrangement is good, so long as it is suitable, and if its end is beauty and interest of effect.

This is the great lesson that wide experience and travel bring—a knowledge of the power and legitimateness of infinite variety.

(To be continued.)

HEXHAM ABBEY.

THE Rev. Canon Savage writes as follows in the Hexham Parish Magazine for October:—

All who love our glorious abbey at Hexham will be distressed at the paragraphs which have appeared recently in the press, which, though in no sense official, represents, perhaps not unfairly, a grave and imminent danger to part of the fabric. The matter has the careful consideration of the rector and the wardens, who are fully alive to their serious responsibilities as official custodians of the church; as well as of Mr. Temple Moore, our distinguished, able, conservative, and careful architect, and his representatives. The rector, on the first suspicion of the movement or settlement, informed Mr. Temple Moore, who at once made examination and gave his official report. The rector then repaired to London for further information; and, at the request of the wardens, is seeing the architect in London with a view to taking necessary action in the matter.

It is a simple matter for us who have neither expert knowledge nor opportunity for close examination to give snapshot reasons for the cause. To do so may be a harmless pursuit, but let us remember that we are by no means infallible. Certainly there is a movement, the evil is of long standing, and, as we have said, grave trouble is imminent unless we take action.

The movement most emphatically is not caused by any new work. Mr. Temple Moore assures us of this. He says: "My surveyor could find no trace of any movement or settlement anywhere in the new walls and work generally, and at the several junctions with the ancient work, where one might expect to find a trace of movement in the later work settling down, the making good is quite unbroken as when first made more than a year ago.

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"Now as to the fracture in the walling forming the jamb of the arched recesses over the archway from the north transept to the new nave aisle. The fracture itself has been visible for years, but certainly it appears to have widened considerably during the last year.

"It is true that the other or outer face of this wall has been restored and made good with some new facing, both above the aisle roof and also below it over the archway, but the wall itself is approximately five feet thick, and this refacing would not disturb it. Also the refacing referred to, and the old facing adjacent to it, have not moved in the slightest degree, as may be seen by examining it from the nave aisle roof.

"Again, neither the new or old work below the foot of the recesses, nor on either side in the tower pier, or the aisle archway jamb, has moved or settled in any way."

Mr. Temple Moore emphasises the necessity of immediate attention, and adds: "The wall above the fracture in question is obviously in a very bad condition, especially towards the top. It looks as though there are some stones in danger of falling."

It is not due to new work. Is it due to the fact that this north transept was roofless? What an opportunity for wind and weather, rain and snow, heat and frost to play havoc! Or again, is it due to this part of the north transept having no foundation which goes down to really solid ground? We fear this may be found to account for much.

We have expended much money in strengthening the abbey fabric from insecure foundation and from crypt to topmost pinnacle according to the urgency of the need. Those who admire the beautiful work of restoring and completing the abbey but little realise the immense amount of unseen reparation which we have carried through to save the venerable church from falling in ruin. The account of Messrs. Thompson, Peterborough, was wholly for repair; and reverent repair looms large in the account of Messrs. Holloway Brothers, Ltd., London.

I never like to hurt people's feelings, but I have abundant evidence to show that for centuries the abbey church has been neglected. Why did the east end fall away and the south transept gable fall out, and the north transept ready to follow suit had we not expended 2,000*l.* on it? Yes, and much more I could say. But we love the abbey, and we must save it and treat the old mother church with love and reverent care. She is the mother church of Northumberland, and the worship of 674 is the worship of 1909, and must be, through us, the worship of 2909. It is our trust, our sacred privilege, our precious legacy.

THE ACTION OF AIR AND STEAM ON PURE IRON.*

THE whole subject of the corrosion of iron is one of great importance, both from a commercial and a purely scientific point of view. The desirability of pursuing further research upon it can therefore be scarcely exaggerated, until the numerous problems connected therewith have met with satisfactory solution.

In a recent communication to our Journal I have dealt fully with the action of air, water and steam upon various forms of iron at temperatures not exceeding 100° C., and mentioned that experiments were in progress with the object of determining their action at higher temperatures. As the results obtained have reached the stage at which they can be safely discussed, it seemed advisable to give them publication at this date.

The iron used in this research was in the form of thin foil, which analysis showed to contain 99.9 per cent. of the pure metal.

Action of Ordinary Air on Iron.

It is well known that when iron is heated in air it soon becomes tarnished, and the particular shade which the iron assumes gives a rough indication of the temperature. In order to compare the action of ordinary, moisture-laden air on pure iron with that of perfectly dry air and of steam, each at varying temperatures, the following experiments were performed:—

A tube, sealed at one end and containing a bright strip of iron foil, was immersed in an oil bath and maintained at 100° C. for five hours. At the end of this time no alteration in the appearance of the iron could be detected. The temperature was now raised to 150° C. for a further period of five hours. Even after this treatment it was almost impossible to decide by mere observation whether or not the surface of the metal was tarnished, for the action was so slight.

A fresh strip was now heated to 220° C. in a similar manner, but in twenty minutes a slight straw tint developed, which became more pronounced as the heating was prolonged.

At higher temperatures the oxidation of the iron was much more rapid, and an almost momentary immersion in a lead bath at 350° C. sufficed to produce a clear blue tint.

Action of Perfectly Dry Air upon Iron.

In view of the fact that H. Brereton Baker has frequently drawn attention to the influence exerted by minute traces of water-vapour on certain reactions, it was interesting to inquire whether or no pure iron would undergo oxidation on exposure to air at different temperatures dried over phosphorus pentoxide. The following results were obtained:—

1. A tube, containing a strip of iron, about 6 millimetres long and 4 millimetres wide, separated from some phosphorus pentoxide by a loose plug of glass wool, was sealed. After the lapse of four months the end containing the iron was immersed in an oil bath at 190° C. for thirty minutes. As the change produced was exceedingly slight, the temperature was raised to 220° C. After the expiration of a second half-hour the iron had assumed a light straw tint.

2. Two tubes similar to the above, one of which had been kept for three months and the other six, were plunged into a bath of molten lead at a temperature of 350° C. In a few moments the iron had assumed a bright blue colour.

We thus see that the entire absence of moisture will not prevent the oxidation of pure iron at temperatures of about 200° C. and upwards. These experiments are therefore being continued in order to include a wider range of observation.

Action of Steam on Iron.

For many years chemists have been familiar with the fact that, when steam is passed over heated iron, hydrogen gas is set free and hammer-scale, or magnetic oxide of iron, remains behind. The equation usually assigned to this reaction is:—

$$3Fe+4H_2O=Fe_3O_4+4H_2.$$

In my previous paper attention has been drawn to the fact that a mixture of pure steam and air may be passed over pure iron at 100° C. without producing any visible effect. The following experiments were therefore undertaken with the object of determining if pure CO_2-free steam has any action upon pure iron at temperatures above 100° C., and if so, at what temperature that action begins:—

Temperature Range, 100° to 250° C.—The apparatus used in these experiments is shown in the figure. The distilling flask A, of 500 cubic centimetres capacity, contained a 2-normal solution of potassium hydroxide, and was immersed in an oil bath, the temperature of which was maintained at

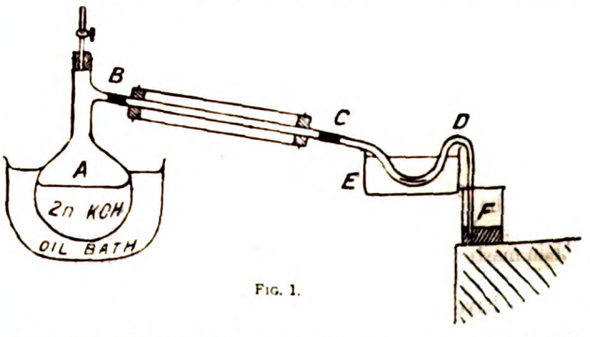


Fig. 1.

approximately 125° C. In order to prevent bumping, the level of the potash solution was kept slightly lower than that of the oil in the bath, and small pieces of capillary tubing, sealed at one end, were dropped into A at the beginning of each experiment. It was found that by adopting these precautions a steady ebullition of the potash could be secured without the manifestation of any tendency to bump. The glass condenser BC was, in the later experiments, fused on to A and B, and connected with the glass tube CD by means of a short piece of rubber tubing. The free ends of the tubes at C were filed to fit one another, in the manner indicated by Bone and Coward, so as to make a tight joint.

At the beginning of the experiment a strip of iron foil 3 centimetres long was put into CD, together with a few drops of potash solution to remove any adhering carbon dioxide. A was now raised to boiling point, and the steam condensing in BC washed the potash away from CD. When the water escaping from the open end F showed no alkalinity to phenol

* A paper read at the autumn meeting of the Iron and Steel Institute, by J. Newton Friend, Ph.D., M.Sc. (Darlington).

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phthalein, F was closed with a mercury seal, the condenser BC allowed to run dry, and the oil bath E heated to various temperatures not exceeding 250° C. After half an hour's exposure to the action of the steam at any one temperature the experiment was stopped by cooling A and allowing a solution of potassium hydroxide to be sucked up through F into CD.

In no case was the iron found to be appreciably tarnished.

Temperature range, 300° to 600° C.

1. *In Copper Tubes.*—At first BC and CD were made of copper, whilst the oil in E was replaced by lead, the temperature of which was determined by means of a platinum resistance thermometer enclosed in a silica tube. The india-rubber joint at C was prevented from perishing with the heat by a loose wrapping of filter-paper kept moistened by a slow stream of water. The experiments were carried out in a manner precisely similar to that detailed above, save that before each fresh experiment CD was heated in a current of pure hydrogen gas to reduce any oxide. The following results were obtained:—

Experiment I.—Four strips of foil, from 2 to 3 centimetres long, were heated thirty minutes at 330° C. The strips remained quite bright, but each was attacked locally at about four different places—presumably where they had lain in contact with each other.

Experiment II.—One strip of foil was heated for twenty minutes at 445° C. The metal was decidedly tarnished.

Experiment III.—A strip of foil was heated for thirty minutes at 520° C. The metal was thoroughly attacked.

It would appear from these experiments that pure iron is attacked by pure steam at some temperature intermediate between 330° and 445° C. To arrive at a more accurate determination of the temperature, however, it was necessary to eliminate several possible errors:—

(i) Caustic potash readily effects the oxidation of metallic copper in the presence of air, and the oxide thus produced is rapidly reduced by iron to cuprous oxide at temperatures near 350° C., with the simultaneous formation of iron oxide. It is clear therefore that during the initial stages of the experiment the inside of CD could scarcely fail to become oxidised, with the result that, on heating in the lead bath, the iron became slightly tarnished.

(ii) Although the temperature of the bath could readily be determined, it was always possible that the temperature of the steam inside CD was slightly lower than this. As this is, unfortunately, an unknown factor, a correction could not be applied.

(iii) It is well known that iron, in common with many other metals, possesses the property of absorbing quantities of different gases, such as the oxides of carbon, hydrogen, and nitrogen, and that the gases are evolved when the metal is heated. It will be clear that these gases, even though present in very small quantity, might exert a disturbing effect upon the reaction under consideration.

(iv) The most serious source of error, and one which it was found impossible to obviate entirely, lay in the difficulty experienced in removing every trace of air from A and BC. This was rendered practically impossible, because a number of capillary tubes, sealed at one end, had to be introduced into the potash solution immediately before each experiment in order to prevent bumping. The error thus introduced is, of course, slight. It has already been shown, however, that air attacks iron fairly rapidly at temperatures above 200° C. Consequently it cannot be expected that iron will remain absolutely untarnished after exposure to steam containing traces of air for any lengthened period. Bearing this in mind, however, it will be seen that the experiments described in the sequel, though but approximations to the truth, are not without value.

2. *In Silica Tubes.*—In order to eliminate the first two possible sources of error mentioned above, tubes of transparent silica were employed of internal diameter 0.4 centimetre. The length of that part of CD actually immersed in the bath E was 23 centimetres, and the strips of iron (usually two in number) were placed at the opposite end to that by which the steam entered. The latter had therefore to pass through a considerable length of the heated tube before reaching the iron, and had thus a better opportunity of attaining to the temperature of the bath. Only such iron was used as had been previously heated to redness for ten hours in vacuo, whereby the greater part of its occluded gases would be expelled. To remove the air as completely as possible from A and BC, the potash was kept vigorously boiling for from one to two hours before the experiment was commenced, and the condenser allowed to run dry. The silica tube CD could not be filled with potash solution, however, as in the corresponding experiments with copper tubes, for the iron was rapidly tarnished by the action of the silica when all the alkali had been washed away, and before the passage of steam was commenced. CD was therefore filled with semi-normal ammonium hydroxide solution, which served to expel all the air from the tube. On connecting at C the steam rapidly expelled the ammonia and most of the water, and immersion in the bath, already at the desired temperature, served to vaporise rapidly any remaining liquid. At the end of the experiment bath E was removed, and, after cooling to nearly 100° C., CD was rapidly disconnected and plunged into a trough of dilute potash solution. This served at once to cool the tube and preserve the iron in contact with the silica. The metal was then removed and examined.

The following results were obtained:—

Experiment I.

Temperature of oil bath E . .	292° to 297° C.
Passage of steam	60 minutes.

Result: The metal was very slightly tarnished.

Experiment II.

Temperature of lead bath E . .	330° C.
Passage of steam	60 minutes.

Result: Exactly the same as in Experiment I., save that in addition to the slight tarnishing, one strip had a small dark spot where the second strip had lain across it.

Experiment III.

Temperature of lead bath E . .	360° C.
Passage of steam	60 minutes.

Result: The metal was a dark straw colour.

Experiment IV.

Temperature of lead bath E . .	380° to 390° C.
Passage of steam	60 minutes.

Result: The metal was very much darker and thoroughly attacked.

Similar experiments were also performed for thirty minutes each at 430°, 450°, 470°, 510°, and 550° C.; and for sixty minutes each at 430°, 470°, and 500° C. In every case the metal was found to be thoroughly attacked.

Since the iron was only very slightly tarnished, but to an equal extent, in Experiments I. and II., although the temperature difference was above 30° C., it seems reasonable to conclude that the oxidation was caused by the traces of air in the apparatus, to which reference has already been made. Since these traces of air will remain practically constant in amount for any one apparatus, the increased oxidation observed in Experiment III. at 360° C. may be attributed to the action of the steam. As the temperature is raised to 380° C. and upwards, the corrosion becomes still more marked.

It appears, therefore, that steam begins to decompose in the presence of iron at some temperature intermediate between 330° and 360° C.—say, 350° C. in round numbers. It is highly improbable that any definite temperature could ever be fixed exactly at which the decomposition of steam might be said to begin. For at a certain temperature the amount of decomposition which could take place might be too small for detection in one hour, and yet in the course of several hours, days, or weeks be most pronounced. Furthermore, the physical condition of the iron and of the walls of the tubes through which the steam passes will probably exert a marked influence, for it is well known that gases are very susceptible to changes in this respect.

Another way of determining whether or not iron is attacked by steam at any particular temperature would be to observe if hydrogen gas escaped during the experiment. An apparatus is being devised with this object in view. The advantage is that the effect of traces of air would be negligible, but, owing to the solubility of hydrogen in water, the temperature at which this gas could be detected would be almost certainly above that at which the steam begins to undergo decomposition.

It may be of interest to place on record here the action of molten lead on silica. Repeated immersion of the latter for periods varying from thirty to sixty minutes in length, at temperatures ranging from 330° to 450° C., produced but little effect. On cooling the lead could be readily scraped off, leaving the tube nearly as transparent as before. After the prolonged immersion at 500° to 600° C., extending over several hours, to which the pyrometer tube was exposed, the lead was less readily removed. On scraping thoroughly and immersing in nitric acid for several hours the tube became nearly clear again, though a slight milkiness still persisted. It will thus be seen that transparent silica tubes form an

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excellent protection for a pyrometer immersed in a lead bath —at any rate when the temperature does not exceed 600° C.

The results detailed above are capable of explanation in two ways:—

(i) We may assume, as is usually done, that the iron itself decomposes the steam at those temperatures at which corrosion takes place.

(ii) The reaction may be regarded as taking place in two stages, comprising, first, the dissociation of the steam; and, secondly, the union of the oxygen thus liberated with the metallic iron.

The former view is not easy to reconcile with the fact that hydrogen gas readily reduces the oxides of iron to the metallic condition—a reaction which is the direct reverse of that under discussion.

On the other hand, the second view explains the above anomaly, and is also in harmony with our knowledge of the dissociation pressures of oxygen in equilibrium with steam and oxide of iron.

Alfred Holt, jun., has recently attempted to determine the lowest temperature at which the dissociation of steam becomes a measurable quantity. He finds that at 775° C. very small volumes of electrolytic gas can be collected—a fact which proves that dissociation must begin at considerably lower temperatures. There can, therefore, be no objection to the assumption that at 350° C. steam is slightly dissociated, although the degree of dissociation may be excessively small. It will be clear that, if the partial pressure of the oxygen is ever so slightly greater than the dissociation pressure of any oxide of iron at the same temperature, oxidation will take place. Now Walden has shown that at temperatures as high as 1350° C. the dissociation pressure of ferroso-ferric oxide, Fe_3O_4, is so small as to elude detection. At lower temperatures it will be presumably smaller still, and may well be of the same order as that of steam at 350° C. The dissociation pressure of ferrous oxide, FeO, is likewise excessively small. So that, whichever oxide is formed, there is nothing in these data to render the theory advocated by the present author untenable, and since it possesses several advantages over the usually accepted theory, the author regards it as being more probably nearer the truth.

If this be granted, we have here a means of calculating the dissociation pressure of the oxide of iron produced by the action of steam on the metal at 350° C., for it will be of the same order as the partial pressure of the oxygen in the steam.

From thermodynamical considerations, Nernst and Wartenberg have arrived at the following equation connecting the dissociation of steam with its absolute temperature—

$$\log \frac{2x^2}{\left(2+\frac{x}{100}\right)\left(1-\frac{x}{100}\right)^2} = K - \frac{25030}{T} + 2{\cdot}4 \log \frac{T}{1000} - 0{\cdot}00016(T-1000)$$

where x represents the percentage dissociation of steam, by volume, and T the absolute temperature. To the constant K the value 11.38 is assigned. By neglecting x, as compared with 100, and dividing throughout by 3, we arrive at the simplified equation—

$$\log x = 3{\cdot}79 - \frac{6343}{T} + 0{\cdot}8 \log \frac{T}{1000} - 0{\cdot}00005(T-1000).$$

At 350° C., therefore, $x = 1.02 \times 10^{-10}$, and the dissociation pressure of the oxide of iron is thus of the order of 1.02×10^{-12} atmospheres, which is, of course, far too minute to admit of direct measurement.

Conclusions.

The results obtained in this research may be briefly summarised as follows:—

1. Pure iron combines with ordinary air and with air dried over phosphorus pentoxide with increasing readiness as the temperature rises. Below 150° C. the oxidation proceeds too slowly to be readily detected.

2. When pure iron is heated in pure steam at temperatures ranging from 350° C. upwards, the metal becomes tarnished.

3. The author concludes that the action of steam on iron takes place in two stages, comprising, first, the dissociation of the steam; and, second, the combination of the dissociated oxygen with the iron, and the consequent liberation of free hydrogen gas.

4. If conclusion 3 is correct, the dissociation pressure of the oxide of iron produced at 350° C. is of the order of 1.02×10^{-12} atmospheres.

In conclusion, the author has pleasure in acknowledging his indebtedness to the research fund committee of the Chemical Society for a grant which has defrayed the greater part of the expense entailed by this work.

ILLUSTRATIONS.

NORWICH UNION CHAMBERS, PICCADILLY, W.—GENERAL VIEW—DETAIL OF DOORWAY.

THE Norwich Union building occupies a commanding position, with frontages to St. James's Street and Piccadilly. The façades on the ground floor are in Welsh Jasper, while Greek Pentelikon marble is used for the first floor and upwards. The roof is in purple Broseley tiles. The sculpture, balconies, gutters, and some other features are of bronze. The street angle is surmounted by a group representing "Justice," "Forethought," and "Thrift," designed and executed by Mr. Herbert Binney. The construction is very substantial, and is fire-resisting throughout, as was explained in our issue of February 12 last. The building has been so planned that the floors can be divided up to meet tenants' requirements. Ample sanitary accommodation is provided on each floor. Among the contractors were:—Fire-resisting construction, Messrs. D. G. Somerville & Co.; lifts, Messrs. Archibald Smith & Stevens; wood-block flooring, The Zeta Wood-Block Floor Co.; and general contractors, Messrs. Patman & Fotheringham, Ltd., Theobald's Road, W.C. The architects are Messrs. Ernest Runtz & Ford.

ROYAL INSURANCE BUILDING, PICCADILLY, W.

THIS building, designed by Mr. John Belcher, R.A., stands on a site similar to, and facing, the Norwich Union building, which is also illustrated this week. Both buildings have frontages to Piccadilly and St. James's Street, and both extensively employ Pentelikon marble, supplied by Marmor, Ltd. The Royal Insurance Co., Ltd., occupy the greater part of the ground and mezzanine floors for their West-end offices. The steel framework is carried up to the roof. The 30 feet retaining wall to the basement and lower ground floor is of concrete, reinforced with indented bars. The building is carried on seven steel stanchions, each supporting from 400 to 600 tons dead weight. The window frames and casements on the ground and mezzanine floors are of bronze, and those above of steel. The Mansard roof is covered with Westmorland slates, with bronze-covered dormers. The sculptured figures recessed at the third floor level are by Mr. Bertram Mackennal. The general contractors were Holloway Bros., Ltd.

WINSFORD AND EAST DENE, MURRAY ROAD, WIMBLEDON.

THESE two houses, standing on frontages of 50 feet each, have recently been completed in Murray Road, Wimbledon Common. The external facings are of purple stocks, with red-brick bands and enrichments in the case of the former, and with red quoins and dressings and tiled enrichments in the latter, having rough wide joints. The roofs are covered with thick handmade sand-faced tiles. The entrance door and pilasters of Winsford are old, and belongd originally to Merton Abbey House, which Nelson used to frequent. The entrance pathways are paved with old flagstones. The accommodation in each case consists, on the ground floor, of dining-room, drawing-room, morning-room, staircase-hall, garden-hall leading to verandah and stone-paved court in the rear, pantry, lavatory, w.c., kitchen, scullery, and offices. As the fronts face N.E., the kitchens and morning-rooms were placed there, leaving the best aspect for the dining-rooms, drawing-rooms, and sitting-halls. On the first floor there are four bedrooms, large dressing-room with fireplace, bath-room, w.c., h.m.c., and linen-closet. The attic floor has three bedrooms, box, and cistern-rooms, &c. Mr. A. Leather, of Wandsworth, was the builder, and Mr. Walter E. Hewitt, A.R.I.B.A., of 22 Buckingham Street, Strand, W.C., was the architect.

OXFORD COLLEGE SERIES, BRASENOSE.—FRONT QUAD—BACK QUAD

IN our issue of October 1 we gave a descriptive account, by Mr. John Buchan, of Brasenose College, and in the preceding week we illustrated the college as seen from the High Street and the Chapel Quad.

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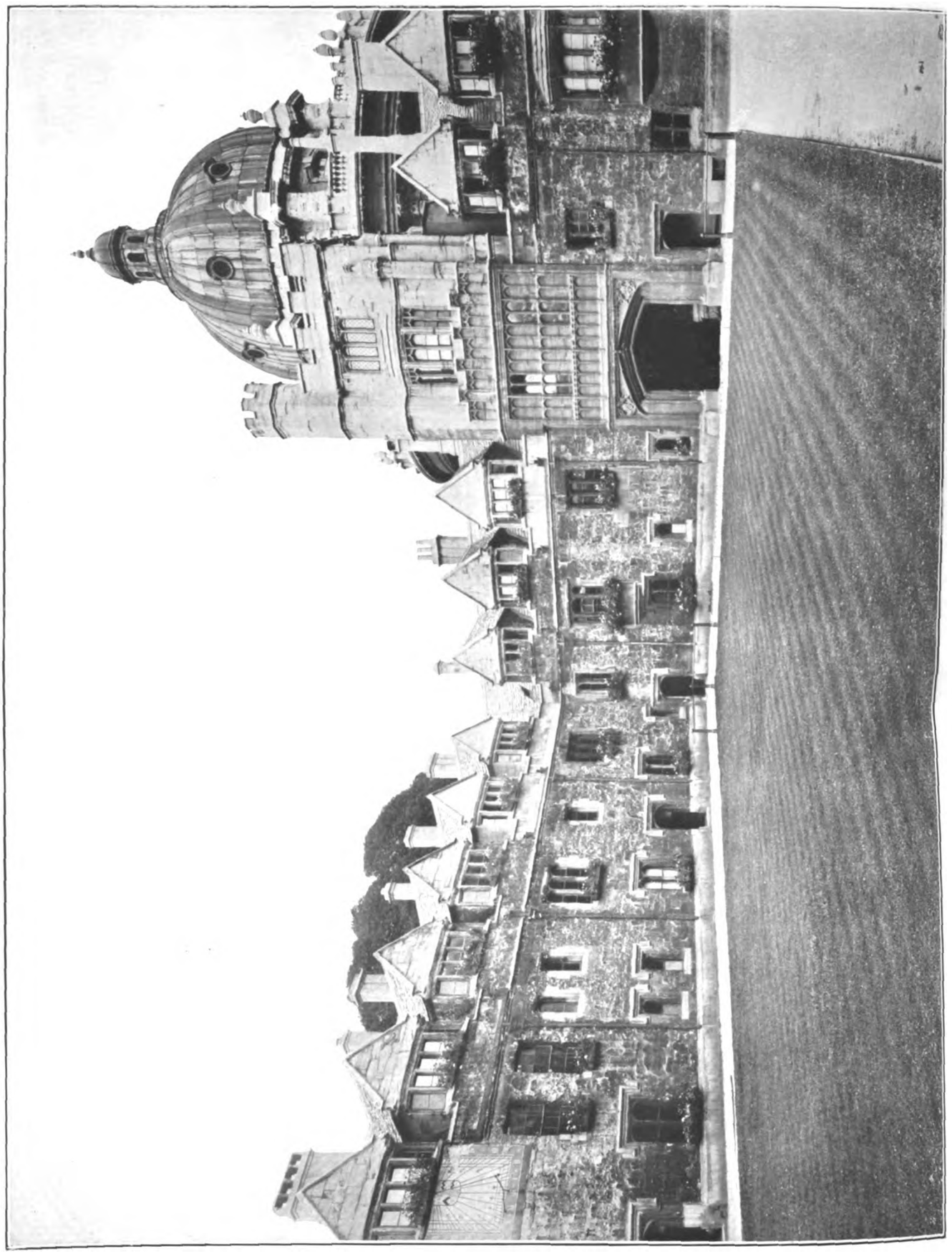
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W.—GENERAL TIN-

DELL, W.

WINKLE

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OXFORD COLLEGE SERIES. No. 55.—BRASENOSE: FRONT QUAD.

Photo by A. E. WALTHAM, 60 Doughty Street, W.C.

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"WINSFORD," AND "EAST DENE," MURRAY ROAD, WIMBLEDON.

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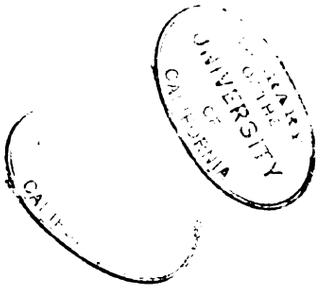
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NORWICH UNION CHAMBERS, PICCADILLY, W.: GENERAL VIEW.

Messrs. ERNEST RUNTZ & FORD, Architects.

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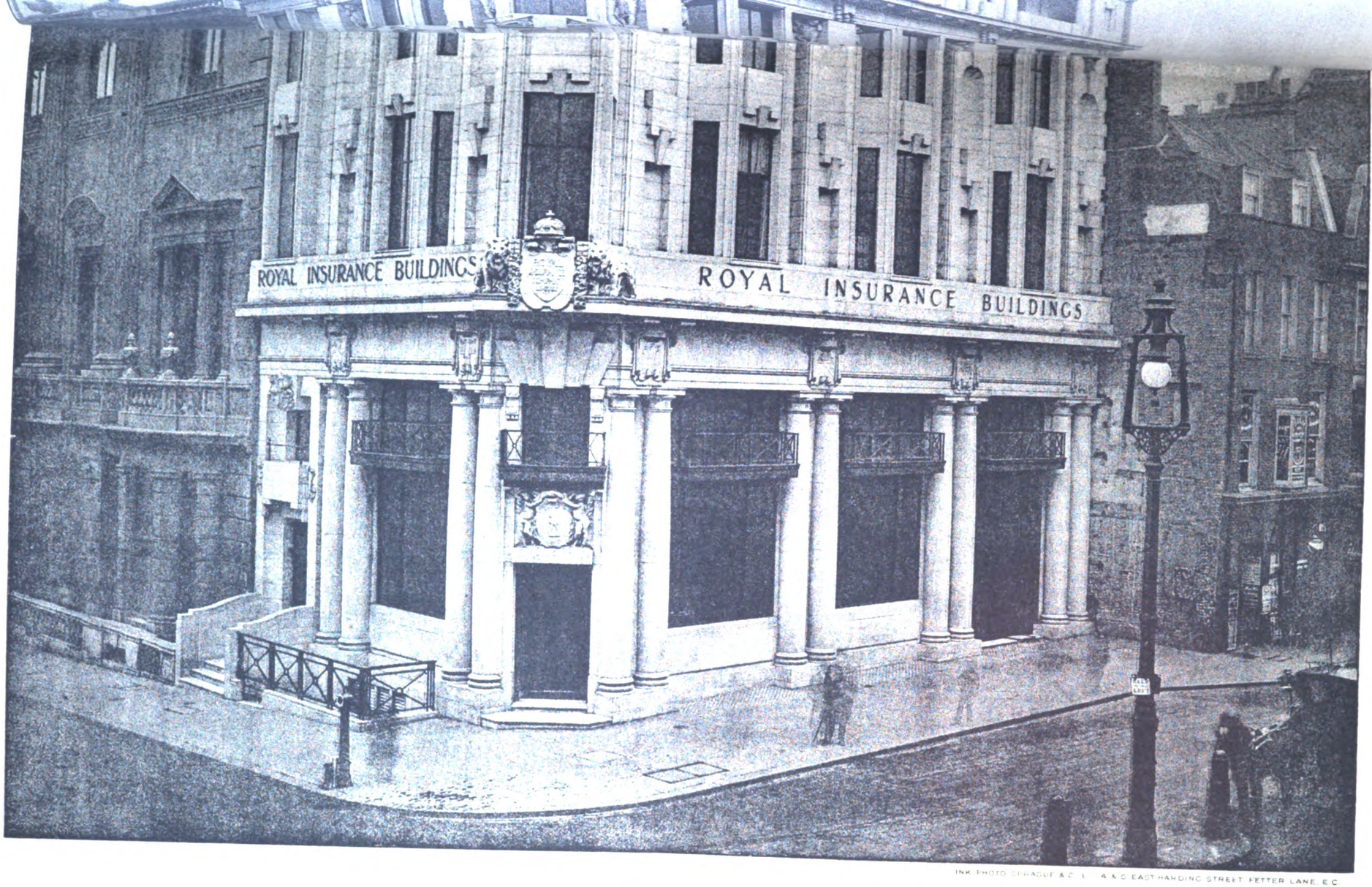
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ROYAL INSURANCE BUILDING, PICCADILLY, W.

JOHN BELCHER, A.R.A., Architect.

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NORWICH UNION CHAMBERS, PICCADILLY, W.: DETAIL OF DOORWAY.



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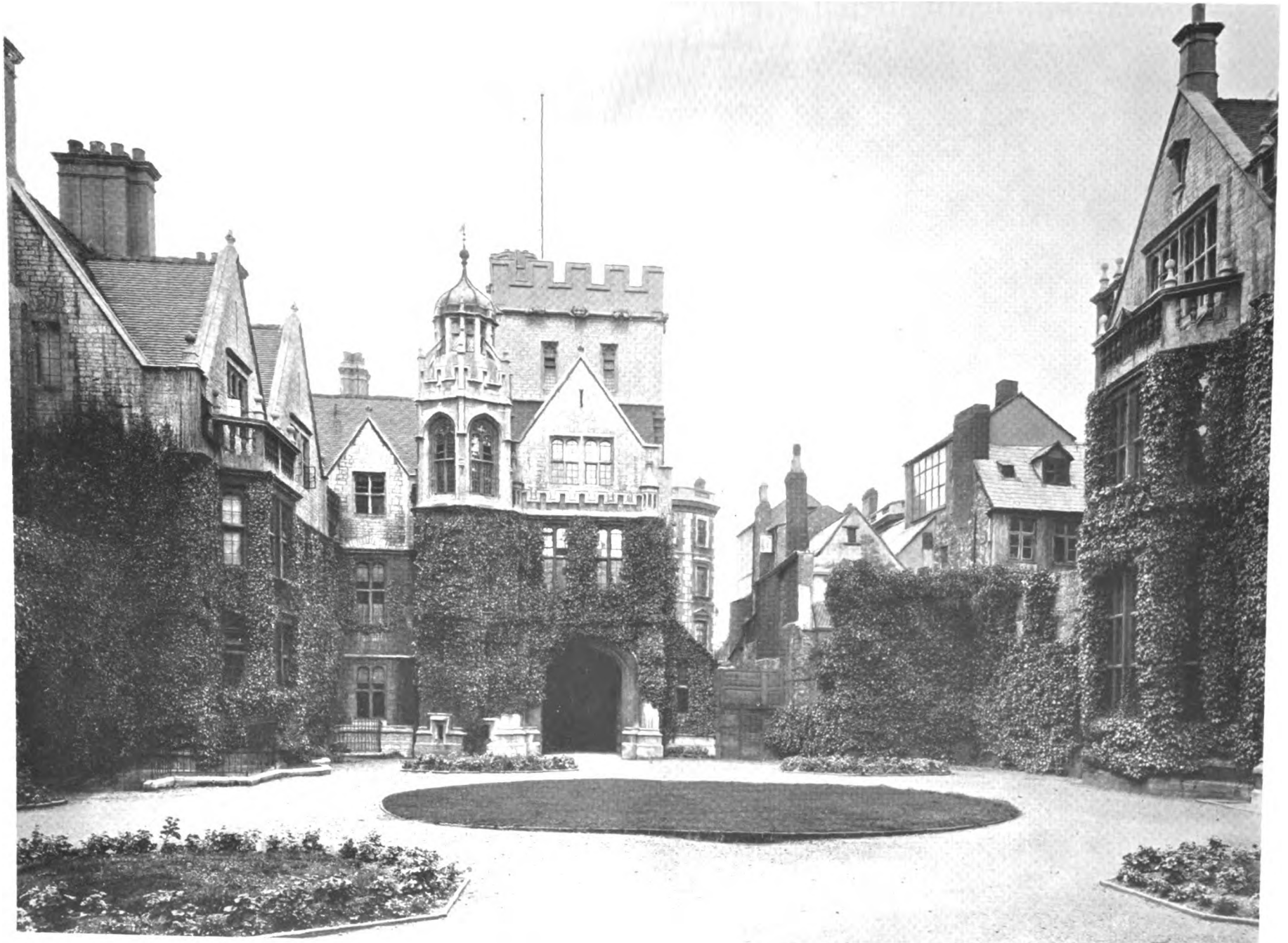


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OXFORD COLLEGE SERIES. No. 56.—BRASENOSE

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ROCK AND ITS CHURCH.

MANY interesting churches and relics of the past are to be seen in ground explored by few, far from the main highways. Amongst these is the church of SS. Peter and Paul, in the village of Rock, Worcestershire.

The parish of Rock, the original name of which is "AK," being the Anglo-Saxon for "oak," possesses an Early Norman



ROCK CHURCH—INTERIOR.

church of particular interest. The registers, which date back to 1547, contain as the first name that of John Borarton, who had a child christened on June 11 of that year. They are complete down to 1642; then there is mutilation, and the next entry is July 5, 1653, after which there is another gap, and they recommence in April 1678, and so continue complete to this date.

It is recorded that in 1510 Judge Coningsby added to the church the south aisle, the chantry of St. Mary and St. George, and the tower. He is also credited with having lengthened the chancel, and with having broken into a great deal of the Norman work. Others have also erased much of the

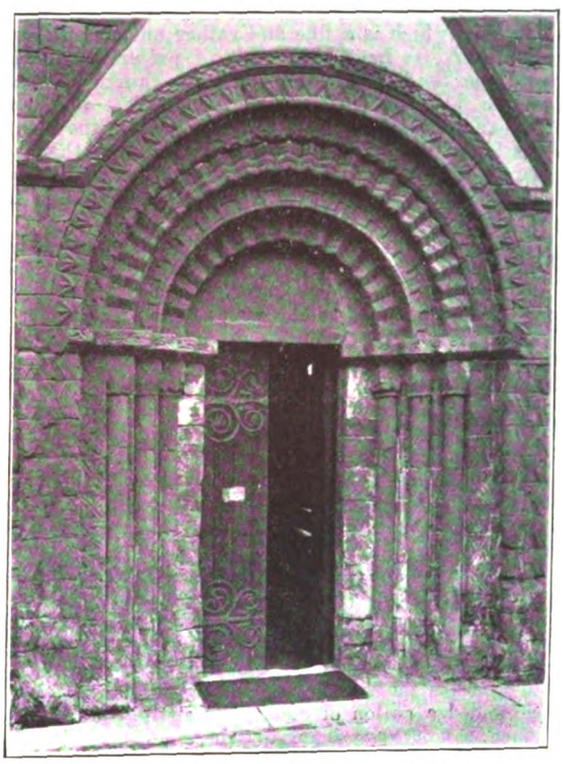


ROCK CHURCH—NORTH SIDE.

original character of the church. The restoration work which has been carried out during recent years is far from satisfactory. Many of the windows in the nave, chancel and tower have been removed and tracery work placed in the openings which is hardly in keeping with the general character of the church.

One notable feature is the entry at the north door, it being by a descent of three steps. Nash asserts that part of the present church is Saxon, and gives as his reason these three steps down into the church. There is, however, no trace of Saxon stonework to be found to bear out this theory.

The accompanying illustrations show the north door and



NORTH DOOR, ROCK CHURCH.

the interior, the latter showing the chancel arch, and both being striking examples of Norman work.

This church is one of the many in which the chancel is not in a line with the nave. It has been suggested that as



THE FONT, ROCK CHURCH.

the church is dedicated to SS. Peter and Paul this may account for the varied axial alignment. The one part may have been dedicated to St. Peter and the other to St. Paul.

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The orientation of the chancel being in June and that of the nave in January, would have varied according to the position of the church to the sun, but there are so many churches of single dedication in which variation of axial line exists, that the theory is more plausible than probable.

Another conspicuous detail which still exists is the line of corbels of the Norman roof. The outline of the old waggon-tilt Norman roof over the chancel arch can also be distinguished.

The font, which is a fine and rather unusual example of Norman work, is in a good state of preservation, as will be seen from the illustration. That this church was a silent witness to much strife is proved by the fact that various grooves and marks are still to be found on the stones on the outside of the church, where men sharpened their spears or arrows, either choosing this particular stone because of the hardness, or wishing to sanctify their weapon before departing to battle.

On the south wall of the tower there are marks of bullets caused by the tower being used as a target by the Duke of York's Volunteers at the beginning of the nineteenth century. Evidence is also to be found of the precautions taken to guard against marauders in early times, as in the north doorway there are traces of slots for some sort of a heavy bar to bolt the door.

Standing in the church is a curious old chest, cut out of a solid log of a tree and studded with nails to prevent pilfering. It is evidently a Peter's pence chest, as there are three rough escutcheons where there were old locks, and another where there was a slot to drop the coppers in. The present hinges are Jacobean, but the remains of the old hinges still exist.

In the roadway adjoining the churchyard are to be seen a whipping-post and stocks. The whipping-post has a double lash, one part for a man, and the other for a woman. The stocks have been used, one is informed, in the memory of man. It is also reported that the parish constable who lived opposite the stocks, once placed a man in them and then fetched a gallon of cider, and sitting down beside the prisoner they both got drunk together.

As is the case with all old villages many strange and curious stories are current of the customs that existed in the early days. The following is perhaps the most interesting. It is said that raindrops caught on Ascension Day were carefully bottled, and, receiving the name of Holy Water, were a certain cure for sore eyes. The idea is evidently taken from the disciples gazing at the receding form of their Master on the cloud. It is said there are some old folk still living in the parish who have the same superstitious beliefs.

THE UNION OF ENGINEERING SOCIETIES.*

LAST year when I had the honour of addressing you on an occasion similar to that which calls us together this evening, the Civil and Mechanical Engineers' Society was on the point of completing the first half century of its life as a technical organisation.

At the present moment our Society has advanced a small, yet appreciable, distance into the second half of the century, and, as you may judge from the annual report which was presented by the Council at the concluding meeting of the past session, we commence the new era with unabated strength. Our capacity for usefulness is greater than ever before, our membership exhibits marked increase, and our financial position is thoroughly sound. These facts in themselves would justify the most favourable prognostications of future usefulness. Nevertheless, a definite scheme is now before all of us providing for the extinction of the Society in an individual capacity, a precisely similar proposal having been submitted to the members of the Society of Engineers, which also is enjoying unexampled prosperity. The two projects are virtually one, resulting from the deliberations of the Joint Committee of the two Societies under the chairmanship of Professor Henry Adams, and which foreshadows the incorporation of an entirely new organisation to be entitled the Society of Engineers (Incorporated), and empowered to take over the work and property of the Society of Engineers founded in 1854 and of this Society founded in 1859.

I desire to say emphatically that the incorporated society will not arise from the ashes of two defunct bodies. On the contrary it will come into existence by the voluntary union of two associations full of vitality, drawn together by similarity of aim and by the firm belief that united effort will be to the advantage of all concerned.

Of course, it will be understood that the final decision rests with the members of the two societies. If the general consensus of opinion should be adverse, then for this Society I can say that we are fully prepared to continue alone, looking into the future with absolute confidence. But my hope, and the hope of my colleagues on the Council, is that the scheme of incorporation will be carried through.

Some reference to the subject was made in my address of last year, when I did not feel at liberty to enter into details. On the present occasion, however, there is no reason for reticence, and I gladly avail myself of this appropriate opportunity of making some remarks upon the general bearing of the scheme of incorporation. At the outset I think it only right to express the indebtedness of this Society to our honorary secretary and fellow member, Mr. A. S. E. Ackermann, for the immense amount of laborious work he has performed in preparing for consideration drafts of the rules and by-laws intended to govern the operations of the incorporated Society. I have also great pleasure in bearing witness to the tactful manner in which he has acted as the official intermediary between the two organisations concerned and in directing your attention to the valuable work done by Professor Henry Adams, a past president of both societies, and by Mr. R. H. Willcocks, who has acted as our honorary solicitor for a long period of years.

The memorandum and articles of association embodying the constitution of the new Society, which I may perhaps venture to say is about to be formed, are drafted, like those of the Institution of Mechanical Engineers, the Institution of Electrical Engineers, and other important institutions, in accordance with the provisions of the Companies Acts, the object gained by taking advantage of those statutes being the assured legal status of the association indicated.

In the title "The Society of Engineers (Incorporated)," we have a permanent record of the fact that a new society—neither the unincorporated Society of Engineers nor our own unincorporated Society—is about to be brought into existence.

The objects of the proposed corporation as defined in the Memorandum of Association need no comment, for they are virtually the same as those which have been consistently before the Society of Engineers since December 1857 and the Civil and Mechanical Engineers' Society since May 1859. An important point to be noted, however, is that the incorporated society will possess legal rights never enjoyed by either of the informal associations.

Turning now to the articles of association, I may mention first that four classes of corporate members and one class of non-corporate associates are contemplated, instead of three classes as heretofore. The class of members is retained; existing associates are eligible for election into the new class of associate members, a new class of associates being formed for those not qualified professionally, or by reason of age, for the privileges of corporate membership; the new class of Fellows provides a mark of distinction for members qualified by adequate professional training and experience and by examination, the only exceptions contemplated being those in favour of presidents and past presidents and members of council; the new class of Honorary Fellows will supersede that of honorary members, and involves no change beyond a slight alteration of style.

The only remark I need make concerning these classes is, that the proposed creation of Fellows is one distinctly calculated to benefit the incorporated Society, because it will establish a class of members known to have complied with recognised standards of general education, technical knowledge, and personal experience. As announced in the presidential address delivered by Mr. J. C. Inglis in November 1908, the technical proficiency attached to membership of the Institution of Civil Engineers has induced the War Office and the India Office to entrust the council of that institution with the important function of selecting and recommending candidates for appointment to the reserve of officers for the Royal Engineers and for engineering appointments in the Indian Public Works Department. Communications concerning the recommendation of engineers for public works appointments have also been received by our own Society, and, as I am informed, by the Society of Engineers. The growing recognition of engineering institutions and societies by Government Departments and public authorities is certainly a strong reason for the establishment by the proposed incorporated society of the special class of members qualified by examination as well as by engineering training and experience.

* Presidential address by W. Noble Twelvetrees, M.I.Mech.E., A.M.I.E.E., M.R.S.I., delivered on October 7 before the Civil and Mechanical Engineers' Society.

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Passing next to the constitution of the council of the incorporated Society, I am pleased to say that owing to the large number of new members elected to the Civil and Mechanical Engineers' Society during the past two years we have become entitled to a very strong representation, comprising four ordinary members of council and two past-presidents—the former chosen by seniority of election to our present Council, and the latter being the two last presidents of this Society. A further satisfactory detail is, that one of the members of our present Council has been nominated by the two councils as one of the vice-presidents.

An additional illustration of the equitable manner in which the interests of this Society have been studied is furnished by the clauses entitling all members and associates of this Society to become corporate members of the incorporated Society without entrance fee, and during the first three years to pay lower annual subscriptions than those stated in the general schedule.

Another point to which the attention of members may be invited is, that in the annual list of members and associates of the incorporated Society the names of the past presidents of the Civil and Mechanical Engineers' Society will be printed in a separate list, together with past presidents of the Society of Engineers and past presidents of the incorporated Society. Moreover, the names of all living past presidents of this Society will be printed in capitals in all lists of members, with a note of the office held after their names, while members and associates of this and the other unincorporated society will be distinguished by a small initial letter printed opposite the date of original election.

These are the chief matters of direct interest to us as a Society, and I think we have ample reason for being satisfied with the terms of unification expressed by the memorandum and articles of association of the Society of Engineers (Incorporated).

By entering into the arrangement proposed we shall give up nothing but our separate existence, which also will happen to the Society of Engineers, and thereafter the members of both associations, as existing to-day, will be jointly the founders of the new corporation, which there is every reason for believing will soon justify its right to be classed among the great institutions representing the engineering profession in this country.

Although in sympathy with the regret doubtless felt by some of our older members that the independent career of this Society will be ended by the adoption of the scheme now awaiting final confirmation, I cannot avoid the conclusion that if carried into effect the union of the two organisations concerned will be an unmixed blessing. It will constitute the first important step towards the alliance of engineering societies having the same objects in view—a consummation whose desirability was urged in my address of last year.

The position of the engineering profession to-day is such that it cannot be fully represented by any one of the existing institutions. The scope of the Institution of Civil Engineers is sufficiently catholic for the inclusion of all engineers possessing the requisite qualifications. In that respect it somewhat resembles the Church of England, whose tenets are broad enough to cover the doctrines of practically all Protestant churches in the United Kingdom. No one in his senses can conceive the possibility of merging other organised bodies of qualified engineers into the premier institution, or of persuading denominational churches to enter the fold of the Church of England. Separate institutions representing one profession and separate churches representing one religion will continue their separate existence, but there is no reason why independent organisations should not enter into bonds of union one with another, for the purpose of furthering the good work conducted by all.

Confining attention to engineering, I take the opportunity of advocating once more the effective co-operation of engineering institutions and societies. It is very easy to suggest ideas of the kind, and very difficult to get them carried out. Such a task is immeasurably beyond the power of any one organisation. It is quite possible, however, for one energetic society to accomplish something in the way of unification on the lines of the affiliation scheme embodied in the by-laws of the Royal Institute of British Architects approved by the Privy Council in February 1889.

In those regulations it is provided that any architectural society outside the metropolis in the United Kingdom, in India, or in any Colony or Dependency of the United Kingdom, may be allied with the Royal Institute. The allied societies preserve their independence of action and secure two important privileges, one being that the president for the time being of every allied society within the United Kingdom has a seat on the Council of the Royal Institute, and the other is, that the Royal Institute contributes each year to every allied society not more than one-fourth of the annual subscription paid to the Royal Institute by each member thereof, who is also a member of the same allied society in respect of and for his subscription thereto, such contributions being withheld in cases where there is duality of membership in allied societies. Of course, there are other necessary safeguards in the by-laws to which I refer, but these do not affect the general character of the scheme.

At the present date the societies allied to the Royal Institute of British Architects are nineteen in number, seventeen being located in the United Kingdom, one in Australia, and one in South Africa. Each allied society is the accredited centre of a district, and the official representative of that district in its relations with the centre of the organisation in London.

The names of the allied societies and the districts they represent are the following:—The Northern Architectural Association (Newcastle-on-Tyne) represents Northumberland and Durham; the Leeds and Yorkshire Architectural Society represents the great part of Yorkshire; the York Architectural Society represents the parliamentary division of York and most of the North Riding of Yorkshire; the Sheffield Society of Architects and Surveyors represents Derbyshire, north Lincolnshire, and part of south Yorkshire; the Manchester Society of Architects represents part of Lancashire, part of Cheshire, Cumberland, and Westmoreland; the Liverpool Architectural Society represents part of Lancashire, part of Cheshire, with the counties of Anglesea, Carnarvon, Denbigh, Flint, Merioneth, and Montgomery, and the Isle of Man; the Nottingham Architectural Society represents Nottinghamshire and part of Lincolnshire; the Birmingham Architectural Society represents Warwickshire, Staffordshire, Shropshire, Herefordshire, and Worcestershire; the Leicester and Leicestershire Society of Architects represents the counties of Leicester and Rutland; the Bristol Society of Architects represents Gloucestershire, Wiltshire, Somersetshire, and Dorset; the Cardiff, South Wales, and Monmouthshire Architects' Society represents the counties of Glamorgan, Brecknock, Radnor, Cardigan, Pembroke, Carmarthen, and Monmouth; the Devon and Exeter Architectural Society represents Devonshire and Cornwall.

The above-mentioned societies, together with the home district of the Royal Institute, cover the whole of England and Wales. As the home district is rather a large one it is proposed to establish a new society to represent the counties of Cambridge, Huntingdon, Norfolk and Suffolk.

Scotland brings into alliance with the Royal Institute the following societies:—The Glasgow Institute of Architects, representing the counties of Dumbarton, Sterling, Renfrew, Lanark, Ayr, Kirkcudbright, Wigtown, Argyll, and the Isles; the Dundee Institute of Architecture, Science and Art represents the counties of Forfar, Perth, Fife, Kinross, and Clackmannan; the Aberdeen Society of Architects represents the counties of Aberdeen, Kincardine, and Inverness, and the North of Scotland; the Edinburgh architectural Association represents the counties of Linlithgow, Edinburgh, Haddington, Berwick, Roxburgh, Dumfries, Selkirk, and Peebles.

In Ireland the Royal Institute of the Architects of Ireland represents the whole of the country. In Australia the Institute of Architects of New South Wales represents the State of the same name, and in Africa the Cape Institute of Architects represents Cape Colony.

From the foregoing particulars it will be seen that the architectural profession is excellently organised, the Royal Institute having established intimate relations with the principal local institutes and societies, which, although not creating a vast association like that of the German Society of Engineers, or the Austrian Society of Engineers and Architects, nevertheless goes a long way towards securing the effective union of the organisations concerned.

The only action of similar character with which I am acquainted is that which brought into existence the Institution of Mining Engineers, a body including the North of England Institute of Mining and Mechanical Engineers, the North Staffordshire Institute of Mining and Mechanical Engineers, the Midland Institute of Mining, Civil and Mechanical Engineers, the South Staffordshire and East Worcestershire Institute of Mining Engineers, and the Mining Institute of Scotland. The constitution leaves independent action to each institute as before, but all papers read are published in one journal and each institute pays a capitation grant to the central body, which, comprising some 3,000 members, is able to deal with matters affecting the in-

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terests of mining engineers far more authoritatively than a number of isolated institutes each with a small membership roll.

The examples set by the Royal Institute of British Architects and the Institution of Mining Engineers might well be followed by the alliance of the many engineering societies existing in various parts of Great Britain with each other and with a central society in the Metropolis. If the Civil and Mechanical Engineers' Society should decide to abstain from the scheme of union now before the members, the work of unification to which I now allude is one that would deserve serious consideration. But it could be attempted with greater prospects of success by the proposed Society of Engineers (Incorporated).

Assuming the foundation of that organisation, I think there should be no serious difficulty in the way of linking up all unattached provincial associations as societies allied with the Society of Engineers (Incorporated).

At the present time there are probably more than thirty local bodies of the kind, among the more important being the Liverpool Engineering Society, the Manchester Society of Engineers, the Midland Counties' Institute of Engineers, the North-East Coast Institute of Engineers, the Bristol Society of Engineers, the South Wales Institute of Engineers, the Institute of Engineers and Shipbuilders in Scotland. Adding to these the engineering societies attached to universities and colleges, we have ample material for the creation of a combination of several thousands of members, associates, and students. If these various organisations were once allied one with another, and at the same time with the proposed incorporated Society of Engineers, a great step would have been taken towards the consolidation of the engineering profession. The commanding position of a society embodying a large portion of the engineers of Great Britain should facilitate the ultimate alliance of the institutions representing special branches of engineering practice, and lead at last to the organisation of our profession on a scale worthy of the importance which it has justly acquired.

Finally, I take this opportunity of thanking you most sincerely for the high compliment implied by my election for the third year as president of this Society, and of expressing the hope that the scheme jointly prepared by your Council and that of the Society of Engineers may prove to be only the commencement of more extended efforts towards the union of engineering societies and institutions.

FIRE PREVENTION.

AT the City Court, Dr. Waldo concluded an inquiry into the circumstances attending the fire which occurred early on the morning of September 17 at 14 London Wall, E.C., on premises in the occupation of Messrs. Shortt & Kilpin, Ltd., wholesale milliners.

The building was one of six floors, and, according to the evidence adduced at the first hearing, the fire broke out in the lift, in which some warm ashes had been left. There were traces of a second fire having occurred in a cupboard in the showroom, and the inquiry had been adjourned to allow of a further inspection, in order to ascertain whether there was any connection between the two fires.

Miss Elizabeth Laws, employed by the firm, stated that she was positive that everything was safe when she left the building on the night previous to the fire. It was never necessary to strike a match in the showroom, and no one smoked on the premises.

Miss Gertrude Kilpin, managing director of the company, confirmed Miss Laws' evidence, and said that she believed that Mr. Shortt lit his pipe before he left. Until she was told about the warm ashes being found in the lift the fire was inexplicable to her. The value of the stock destroyed was about 700*l*. or 800*l*. Witness first became aware of the fire when she arrived at business in the morning. Many of the articles used in the manufacture of ladies' hats were highly inflammable, some containing celluloid.

Thomas Shortt, of Friern Lane, Friern Barnet, N., a partner and director of the firm, said they would lose several hundreds of pounds by the fire. He stated that some buckles and hatpins used in the business were highly inflammable, being composed of celluloid. The lining material of hats was also highly inflammable. The building was hopelessly damaged by fire, smoke, and water. He could not account for the outbreak.

Mr. C. W. Surrey, district surveyor for the western division of the City of London, said he had made a survey of the burnt premises. Instead of paying him for the work, the L.C.C. owed him the money, and he added that he supposed he would have to sue them in the county court. The Council rarely paid his fees.

The coroner said he had a similar experience when he was appointed coroner for Southwark, and was unable to get any money until he appealed to the Home Office, who, after considerable delay, adjudged him payment at the rate of 6*s*. 8*d*. per inquest, whilst other London coroners received 30*s*. per inquest from the L.C.C.

Mr. Surrey stated that the building was composed of highly inflammable materials, matchboarding entering largely into the construction. He made an investigation to ascertain whether a spark could have run from the lift behind the matchboarding of the showroom cupboard, and came to the conclusion that this had not happened.

As to the origin of the outbreak, Divisional Officer Dyer, London Fire Brigade, said he was satisfied that the fire in the showroom cupboard was a separate outbreak, but it might have originated from a spark.

Colonel Fox was of opinion that the fire in the showroom cupboard was distinct from the fire in the lift. The same building was destroyed by fire on November 17, 1901, when other tenants were in possession.

In summing up, the coroner said he frequently found that fires in the City of London were due to gross negligence, and the law might, if strengthened, prevent a lot of unnecessary fires. At present it was no offence to throw down a light. Culpable carelessness—short of intentional firing or arson—should be made a punishable offence. He would report any recommendation by the jury to the Home Office and to the Lord Mayor.

Answering questions put by the coroner, the jury found that the fire started in the lift, that there was no evidence to show how the cupboard fire occurred, and that there was absolutely no evidence of incendiarism.

THE RATING AND TESTING OF BOILERS FOR HEATING INSTALLATIONS.*

(*Continued from last week.*)

Possibilities of Accurately Rating Boilers.—The crucial question is this, Is it possible to rate boilers according to a standard which is scientific, practical and accurate? Is it possible by codifying, tabulating and analysing the results of a large number of careful experiments to arrive at such a formula as will give what may be called a figure of merit of any boiler, so that one would be enabled to say of two boilers of different types, from measurements alone, that the power of the one is to the power of the other, in the same situation and provided with the same fuel, as 1 is to 1.34, suppose? Will the two boilers always bear the same ratio to one another if they are fixed in identical situations? Has 1 square foot of direct heating surface—i.e. in contact with flame—always the same power, however it is disposed with regard to the hot gases passing over it? If it has not, then unless one can calculate as many factors as there are different possible dispositions of heating surface, it is impossible by any conceivable system of calculation from the measurements only to arrive at a close approximation of the power of the boiler, and the actual heating surface, however accurately given, is not an accurate indication of the power of the boiler.

Now it is quite certain that different portions of the direct fire surface of the same boiler do in fact possess widely different values as heating surface. Surfaces over which the water is moving rapidly will take up a great deal more heat from the furnace than those portions of the surface over which the flow of water is slow. Similarly those portions of the fire surface on which the hot gases impinge directly will take up from the hot gases a great deal more heat than those portions over which the gases move tangentially and slowly. If, then, you compare two equal small surfaces of direct fire surface in the same boiler, over one of which the water and the hot gases are both moving rapidly, the flow of gas being direct impingement, that portion of surface must be not only more, but very much more, efficient than an equal surface of the same firebox over which the movement of water and hot gas is tangential and slow. This being so, it appears to be proved that it is quite possible to have two boilers of different types, each having, let us say, 30 square feet of direct fire surface, and 60 square feet of indirect, and say 70 square feet of secondary surface, whose heating powers may be widely different. If this is so, then mere measurements of the

* Abstract of a paper by A. H. Barker, read before the Institution of Heating and Ventilating Engineers at Manchester.

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surface, however carefully made, are no reliable indication of the power of a boiler, and one maker's tests will be of very little use to any other maker of a different type of boiler.

My own opinion is that the only method of ascertaining accurately the power of any boiler is to make a prolonged and careful test on a boiler of similar design, and I do not think that measurements of different types of boilers can be expected to give more than a very rough indication of their relative powers. It is practicable so to test boilers as to obtain a result which can be reproduced at any future time, and no test is of any value unless it is made in such a way that the same result can be reproduced at any future time if required. I believe, too, that if tests are made of several boilers of a series, all being of similar design, a formula can be evolved which will give a very close approximation to the actual power of any boiler of that design if tested in the same way as the other, and this in my view represents the limit of possibility in evolving formulæ for boiler rating, and if anything more than this is attempted—that is, if an attempt is made to rate boilers of different design from the same formulæ—it will, I believe, be a failure.

There can be no doubt that the actual power of any boiler, that is the number of B.T.U. which can be obtained from it, varies very much according to circumstances. It is often possible by altering the conditions under which a boiler is working even to double the maximum power which can be obtained from it.

It appears, therefore, manifest at first sight that to lay down any hard and fast rule as to the power of a boiler is absurd, except as a rough approximation for ordinary conditions. I have frequently contended at these meetings for a more general recognition of the principle that any hard and fast statement of power of any apparatus is inaccurate or meaningless, unless accompanied by a specification of all the attendant conditions on which that value depends, and that a full specification of those conditions is not a mere piece of scientific pedantry, but a necessary and inevitable corollary of the statement itself. In the case of a boiler, these attendant conditions are curiously complicated. Great results may be obtained from any boiler by observing what may be called freak or laboratory conditions, such as the provision of particular kinds of fuel, the maintaining of a certain thickness of fire, and constant attention in the way of stoking and cleaning, regulation of draught, cooling of firebars, and so on; but if in order to obtain these results conditions must be observed which are impossible to maintain in practical use, it is entirely useless for our purpose either to investigate or to specify them. What we require is the power of the boiler when properly erected, and worked under such conditions as an ordinary intelligent caretaker can observe without an inordinate expenditure of time, trouble and attention, and without the danger of burning the firebars. It is these practical considerations which make the matter so extremely difficult. There would not be much difficulty in defining the conditions necessary for obtaining the best result, but how can one specify exactly the conditions which must be observed by a caretaker, especially as the whole result depends very largely on the conditions which are actually observed? There are many practical questions of primary importance which must be considered in connection with this matter. Boilers differ very materially in the ease with which the flues and the firegrate can be kept clean from soot, dust and clinker. If then there are two boilers of equal power when perfectly clean, other things being equal, the boiler which can be most easily and thoroughly cleaned will in practice give better results than the other. How is it possible to take any account of this difference in any system of rating which can be devised? Then again of two boilers one might be of appreciably greater power with one kind of fuel, while with another kind of fuel the second one might be just as much in excess. Similar differences might arise owing to the greater liability of one boiler to lose efficiency owing to furring and other causes.

Quality of fuel.—This question is one of primary importance. By the quality of fuel I do not mean merely the number of B.T.U. which can be obtained by the combustion of one pound of the fuel. There are many other important qualities, such as quickness of burning, closeness of texture, caking, smoke and soot producing, clinkering, and other qualities, character and quantity of ash produced, and so forth, all of which are of great importance. The boiler must of course be suitable for the fuel to be used with it if the best results are to be obtained.

Also an important question is in regard to the length of time one charge of fuel is intended to last. There are some fuels, such as anthracite nuts, which contain a much greater number of B.T.U. per cubic foot than other fuels such as coke. A charge of the former will therefore last a greater time than a charge of the latter. Again, some fuels are quite unsuitable for boilers with a particular kind of grate bars. Wide grate bars with large air spaces are wholly unsuitable for fuels which are already in or are liable to disintegration by heat into small pieces. Other fuels produce clinker or clinging ashes of such quality and quantity as will speedily clog up the air spaces of the grate if these are too narrow and produce much resistance to flow of air. Other fuels which are liable to give off gas are very dangerous to use with certain kinds of boilers and grate bars. I had one case under my charge where a vertical cylindrical brick-set boiler with cylindrical flues and narrow air spaces between the grate bars was used with a certain kind of fuel which periodically produced violent explosions in the flues—of sufficient violence to blow out the brickwork setting. The trouble was obviated by providing a different kind of grate bars, as the particular kind of fuel used was very cheap in the district, and could not have been changed without considerable extra expense in upkeep.

Elementary Facts.—Before proceeding to suggest methods of testing boilers, it will be well to emphasize the essential facts of the problem. To begin with, every pound of ordinary fuel used in a heating boiler gives off on complete combustion from 12,000 to 15,000 B.T.U. according to the quality of the fuel used. The proportion of this which can be utilised or transferred to the heating medium depends on the amount of arrangement of heating surface provided in the boiler. There is a certain minimum quantity of air required to bring about the complete combustion of the fuel, and every cubic foot of air which is passed through the incandescent fuel in excess of the minimum reduces the temperature of the products of combustion. The higher the temperature of the products of combustion after leaving the incandescent fuel, the greater is the rate of transmission of heat to the water, and the greater the proportion of the heat generated which can be utilised. On the other hand, if the quantity of air is unduly limited, especially with a thick fire, the complete combustion of the fuel is impeded, resulting in the production of the gaseous fuel known to chemists as carbon monoxide, and its escape unconsumed into the air.

It is therefore evident that all combustion is in practice in the nature of a compromise. Practical considerations preclude us from utilising the whole of the heat derived from the fuel, or even from producing by combustion carbon dioxide only, free from admixture of surplus oxygen which reduces the temperature on the one hand, and of carbon monoxide which wastes the fuel on the other.

(*To be concluded.*)

NOTES ON BOOKS.

"An Architectural Handbook of Glastonbury Abbey." By Frederick Bligh Bond, F.R.I.B.A. (Bristol: Edward Everard. 2*s.* net.)

ANY work that Mr. Bond undertakes in the description of ancient architecture may be expected to be thorough, and this little architectural handbook does not disappoint the expectation. The exceeding antiquity of Christian worship and a Christian church at Glastonbury, with the evidence that is available, whether positive or circumstantial, is fully explained, and its character as British or Keltic brought out. The great abbey which, after the old church or churches and associated buildings had been destroyed by fire in 1184, was the glory of western England and the remains of which we see to-day is described in a full history or chronicle. The design of the abbey, necessarily in large part conjectural, is discussed and a detailed account or architectural survey of the ruins as they now exist is given at length. Thus we have an admirable manual invaluable to all who wish to visit Glastonbury with the intention of understanding not only what still remains, but what has existed in the past and made the fame of this interesting national monument.

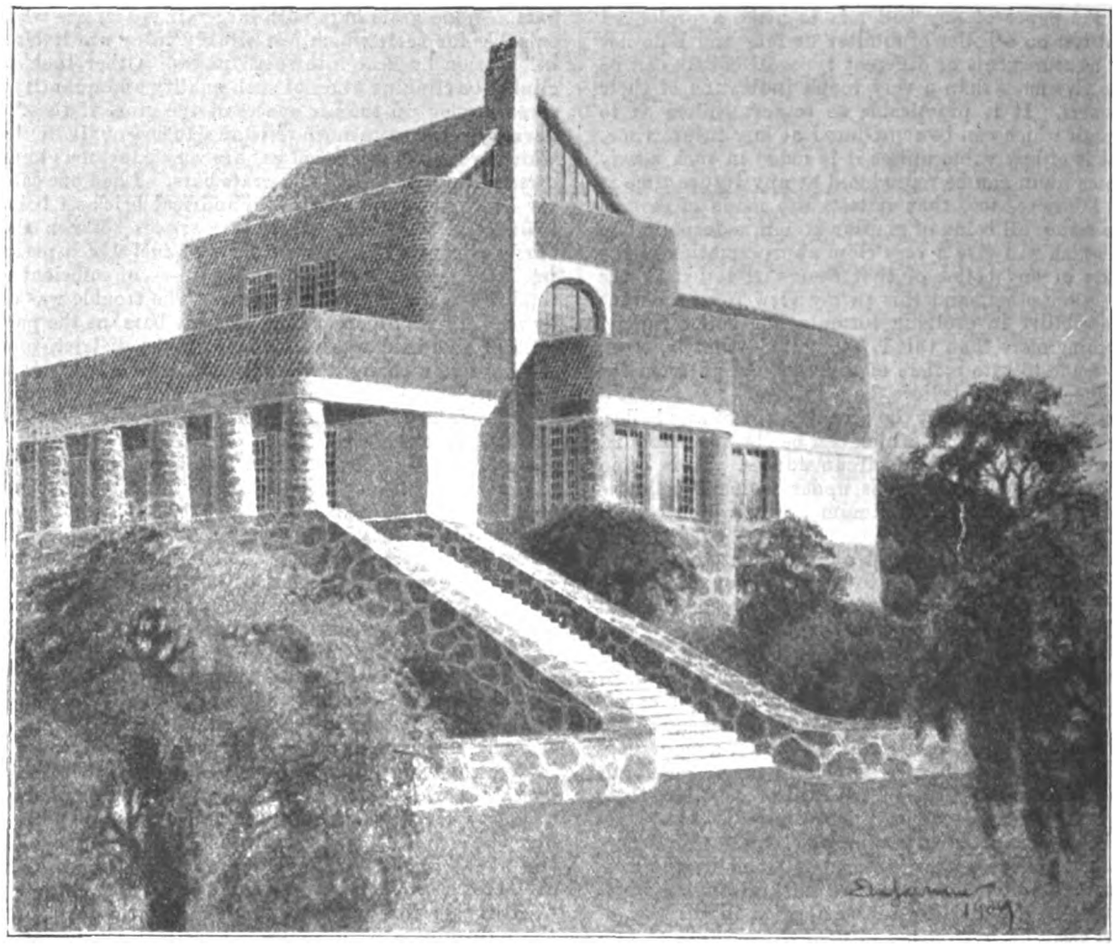
"Stained-Glass Tours in England." By Charles Hitchcock Sherrill. (London: John Lane. 7*s.* 6*d.*)

The idea of arranging for the study of some of the most important examples of English stained-glass in a series of tours each devoted to one particular period of mediæval architecture is piquant and novel, but scarcely economical of time or of travel, and, as arranged by the author, practically only possible by motor-car. For example, Early English stained-glass is supposed to be studied by visits to Salisbury, Canterbury, Lincoln, and York. Going by road from Salisbury to

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MODERN EUROPEAN ARCHITECTURE.

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A SUMMER RESIDENCE ON THE LADOGASEE.
Eliel Saarinen, of Helsingfors, Architect. (From *Moderne Bauformen.*)

Canterbury one would or could without materially increasing the mileage pass through Winchester, Guildford, Gatton, and Knole, but all these the author omits from his Early English tour, and includes in the Perpendicular or the Renaissance trip. Then, in going from Canterbury to Lincoln, Cambridge is omitted, although on the direct road, because the glass that is to be studied there is Renaissance. By-the-bye our motor-car on this tour has to cross the Thames at Tilbury. Having arrived at York, we are permitted to start from there on our tour in search of Decorated glass because there is some at York, but we must not study the Perpendicular examples there. These we must leave to be afterwards seen in the course of another tour. The scheme of the tours then is, from a practical student's point of view, spoilt by the arbitrary pedantry of restricting the subject of study for each to one period, and indeed is of little value to anyone except those who are in need of an excuse for arranging motor-car trips. It is but fair to admit that in his description of the glass seen on any particular tour, the author does not scruple to include some of that belonging to an epoch not the main purpose of the tour. The description of the various examples of glass noticed is of the chatty and vague order, interspersed with tales and references that have nothing to do with the subject, hence of no value to the serious student, but interesting to the dilettante motorist who is only playing at the study of stained-glass and treating it, as we have already said, as a plausible excuse for the direction of his tours. The book does not possess the merits even of a good guide-book, for there is very little attempt to explain the subjects represented, still less at anything like serious criticism.

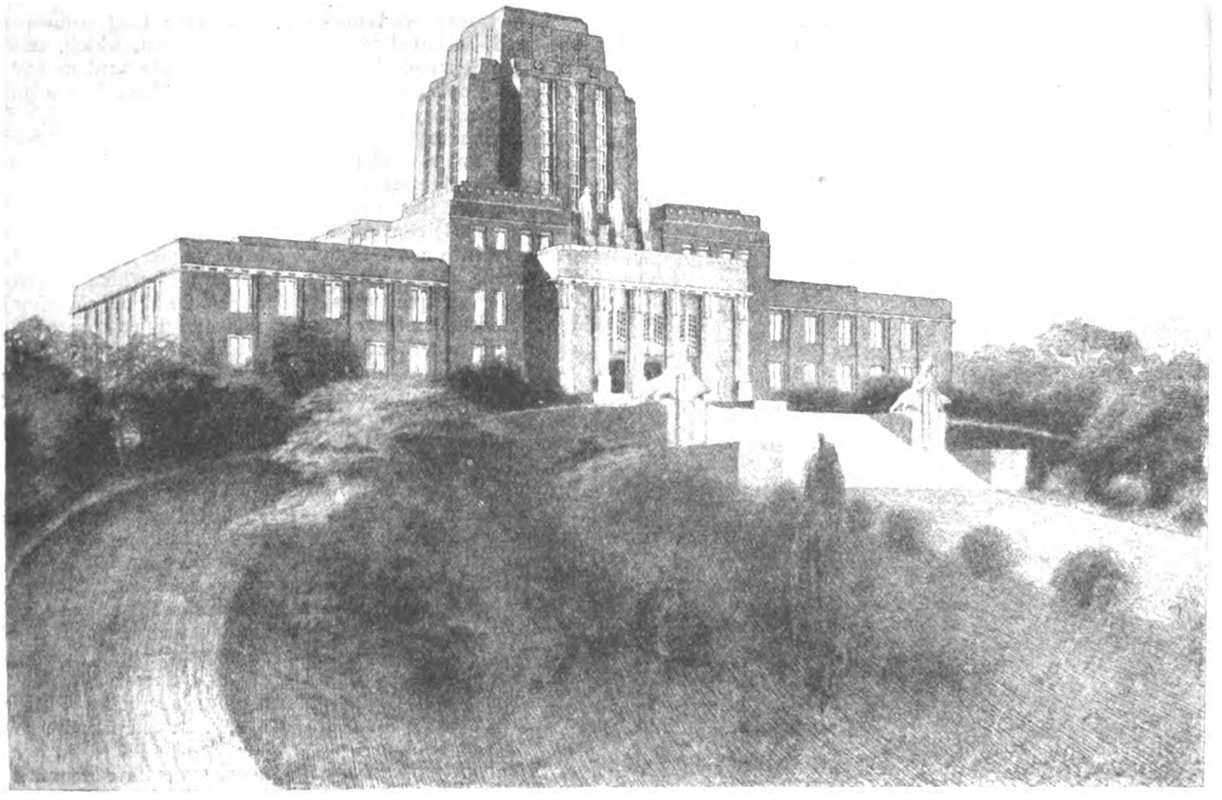
"Sketches and Studies of David Bles." (London: Alexander Moring, Ltd. The De La More Press. 3*s.* 6*d.*)

Ten years ago David Bles died at the ripe age of seventy-eight. For nearly half a century he enjoyed unfailing public favour in Holland as a painter. Yet his name is almost unknown outside that country, and is apparently in some danger of sinking into obscurity even there. The cause of this would seem to be that he never experienced the need of self-advertisement and, like the good-natured man that his photograph shows him to be, was content with a more or less local reputation. In addition his pictures were nearly always inspired by Dutch sources, and dealt with the middle of the eighteenth century. The present book with its introduction by one of his children has for its object to spread the reputation of Bles beyond the narrow boundaries of Holland. This is achieved to a certain extent by the introduction with its personal touches which arouse curiosity as to achievements of the genial artist. But that curiosity is only indifferently gratified by the forty-eight full-page sketches and studies. These are nothing more than working drawings, and are insufficient material for enabling the imagination to conjure up any idea of the completed picture. It is certainly true that they give an insight into "the way in which Bles set to work, of the care and thought he bestowed on his compositions, and of his powers of expressing the various characteristics of his manifold creations." But as it is admitted that his pictures are quite unfamiliar outside Holland, it might have occurred to the compiler that some reproductions of his finished work would have been acceptable among these often disconnected "notes." The sketches have, of course, technical interest, and suggest the high capabilities of David Bles. Indeed the effect is tantalising. The pictures, we are told, are mostly hidden in private collections. This being so, there is still greater reason to publish photographs of them.

The School of Architecture at University College, London, began work on Wednesday last. Professor F. M. Simpsnn attended on October 4 and 5 for the purpose of advisiog students as to their courses.

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MODERN EUROPEAN ARCHITECTURE.
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PARLIAMENT HOUSE, HELSINGFORS.
ELIEL SAARINEN, of Helsingfors, Architect. (From *Moderne Bauformen.*)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* has a description with several illustrations of the Luzerne County Court House, Wilkes-Barre, Pa., which is especially remarkable for the beauty of its internal treatment and for the painted mural decorations which are incorporated with its architectural features. A central area, surmounted by a dome, and with four courts radiating therefrom, produces a Greek cross plan. The exterior was designed by Mr. F. J. Oesterling, supervised by Messrs. McCormick & French, who are also responsible for the interior.

La Construction Moderne describes and illustrates the exhibition at Nancy, which is quite "new art" in a somewhat extravagant form. There is also an article on Old Paris, *apropos* in particular of the churches of St. Julien-le-Pauvre and St. Séverin.

The *Architectural Review* (Boston, U.S.A.) has in recent numbers dealt with the subject of modern gardens in an article by Mr. Thomas H. Mawson, illustrating which are views of Mr. W. H. Lever's garden at "The Hill," Hampstead; Mr. Ochs's house at Walmer Place; Mr. Robert Mawson's house at Windermere; "Fouracre," at Winchfield, of which Mr. Ernest Newton was the architect; Kearsney Court, near Dover; "Frithcote," Northwood. By comparison are given views of Mr. Platt's garden at Cornish, N.H., and plan of the gardens of the Luxembourg, Paris. Another number gives illustrations of an open-air exhibition of American sculpture held last year in Chicago, of designs submitted in the Boston College competition and of a stately mansion at Brooklyn, N.Y., for H. L. Pratt, Esq.

Berliner Architekturwelt has a rather miscellaneous collection of subjects, including the three premiated designs for church and parochial buildings for the community of St. Jacob, at Brunswick; a country house on the Kleinen Wannsee, the design of which is based on the version of eighteenth century English architecture known in the States as "Colonial," and several illustrations of architecture, painting and sculpture from the Berlin Art Exhibition of 1909.

Deutsche Bauzeitung continues the article on Frankish architecture, by Professor F. Ehemann, and gives a fine illustration of the interior of the monastic church of Ebrach, near Bamberg; also views of the picturesque Schloss Mespelbrunn, the old Rathaus, the Sandhof and the Marien Kapelle at Würzburg, and the portal of the parish church of Kitzingen. There is also a description with illustration of a rather striking small house at Pullach, near Munich.

Il Monitore Tecnico compares the international competition for the National Museum of Wales with that for a town school for the commune of Alessandria, being surprised with our method of awarding the job of carrying out the work for a building costing a quarter of a million sterling to the winner of the competition, although he may occupy no position of eminence in his profession. The school for Alessandria is to cost 400,000 liras, and all that the competitors are offered is one premium of 3,000 liras, and two of 1,000 liras. The Italian architects are fighting for an adoption of the English system, and our contemporary makes capital of the Welsh museum competition as an argument.

Construction (Toronto) has an interesting article on "The Missions of San Antonio," the eighteenth century Franciscan settlement in Mexico, with some pretty sketches of remains of the particular version of the Spanish Renaissance that formed the "mission-style" of California and Mexico.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

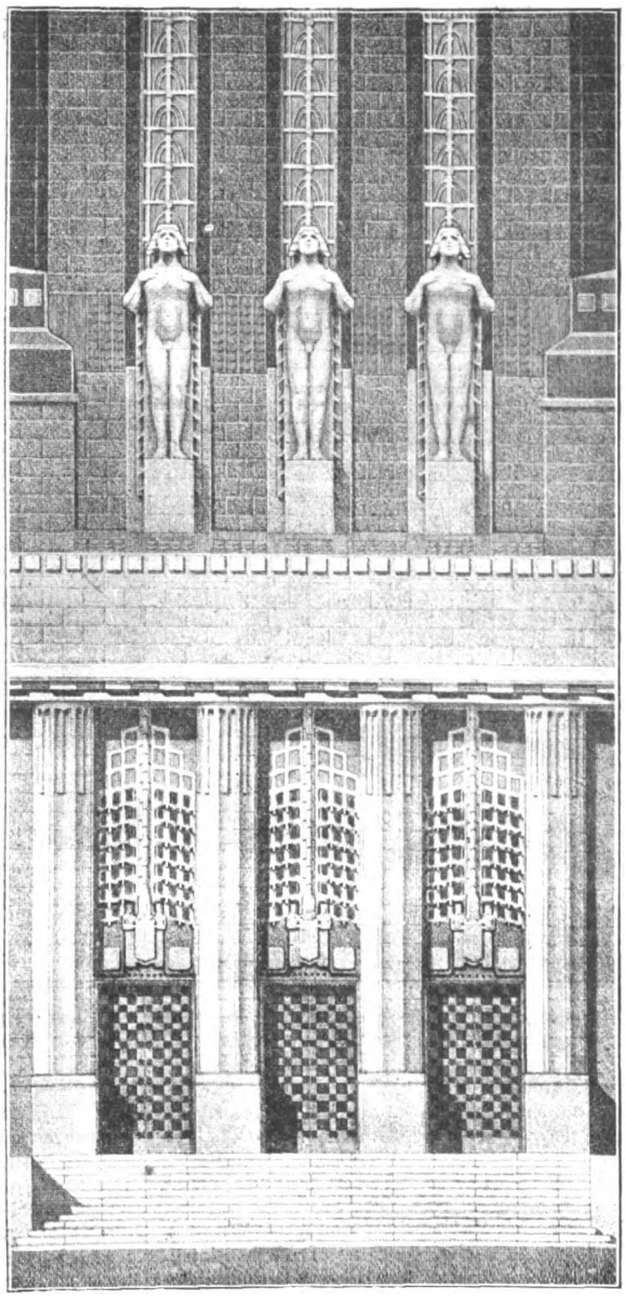
The Budget and Private Enclosed Gardens.

SIR,—Though apparently the Government has withdrawn its proposals to tax enclosed private gardens, it still seems advisable that the attention of the public should be drawn to the dangers it has so narrowly escaped from such ill-considered propaganda.

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MODERN EUROPEAN ARCHITECTURE.

FINLAND.



DETAIL FROM PARLIAMENT HOUSE, HELSINGFORS.
Eliel Saarinen, Architect.
(From *Moderne Bauformen.*)

The Budget proposed to doubly tax private enclosed grounds attached to "squares," "gardens," "crescents," and similar collections of houses. It claimed the right to do so, because these sanitary health-giving local lungs were withheld from the greedy speculations of the speculative jerry builder, and that these quiet, peaceful, picturesque areas are not available to the public.

Unfortunately, till quite recently town planning was neglected by our short-sighted municipal authorities. Indeed, throughout the United Kingdom the intelligent enterprise of far-seeing private individuals alone prevented local over-crowding and over-building by the costly creation—at their own expense—of numerous private enclosed gardens, managed and supported by local residents, paying enhanced rates and taxes because of the privilege of having sole access to these grounds.

Hence, to again tax these houses a second time by taxing their private enclosed gardens would be unjustifiable. It comes to this, that it has been suggested to put an additional tax on picturesque town-planning, tree-planting, hedges, grass, lawns, shrubs and flowers because these embellishments have been provided by private enterprise.

If the taxation of private garden enclosures were granted, then would it not follow that the taxation of houses bordering upon lakes, rivers, and the sea would also be retaxed, because of their adjoining aquatic air-spaces? Such taxes on air-spaces would be even more injurious to public health than the old tax on windows, which were guilty of admitting sunlight, warmth, and air.

To avoid noise and vibration created by "tubes," trams, trains, traffic, and motor-cars, I have long resided in a sheltered, secluded "square" in Brighton, which, in addition to extensive, elegant, enclosed private gardens and sea-terraces sloping down to the beach below, has a unique financial history that has hitherto escaped publicity. These Sussex Square Gardens, constituting the Kemp Town Enclosures, are a model miniature marine garden city, being Brighton's chiefest adornment.

Early in the nineteenth century Thomas Read Kemp (1781 to 1844) converted his Black Rock Farm and adjacent property into a magnificent estate, named after him, Kemp Town, the attraction and adornment of which are the enclosed picturesque "Sussex Square" Gardens, covering some ten acres, with their sea-terraces and grass-covered slopes, extending to upwards of half a mile along the beach.

The park was planned by Sir Joseph Paxton, including beneath the main road or sea front, a tunnel connecting the gardens with the marine terraces below. Under the highway on each side of the tunnel is a cleverly concealed cottage—like a cave dwelling—its roof being underneath the public foot-path above. The top of the "square" is nearly 120 feet above the sea's level. Sheltered from northerly winds by an ivy-clad wall some 35 feet high, the upper and lower marine terraces contain a dozen capacious arches providing excellent shelter and summer houses. This domain is only accessible to the residents in the 103 houses constituting this enclosed estate, the quiet and privacy of which pleased the King in 1908, when staying at the Duke of Fife's residence at the corner of "Sussex Square." By 1837 Kemp's magnificent town-planning punished him with a loss exceeding 500,000*l*. He died in comparative poverty in Paris in 1844.

For nearly a century these enclosures have been, and are, maintained by subscriptions from 103 owners and occupiers of houses on the estate. Their residents have paid extra local rates and taxes for access to the grounds, which yield neither income nor financial profit. Of course, this site can never be developed for building purposes, and to treat and tax it as land withheld from the market with a view to increase rent, is absurd. Indeed, already upwards of 40,000*l*. for wages and materials have been distributed for the upkeep of this park by the owners and occupiers of houses upon this estate, where empty untenanted houses also pay annual subscriptions for the maintenance of the gardens.

J. Lawrence-Hamilton, M.R.C.S.
30 Sussex Square, Brighton.

COMPETITIONS.

We have received from the Secretary of the R.I.B.A. the following announcement:—The Competitions Committee of the Royal Institute of British Architects are corresponding with the Warrington authorities with a view to the amendment of the conditions in this competition.

The Metropolitan Borough Council of Deptford recently organised a competition for a branch library at New Cross, S.E., and limited it to architects practising in the city and county of London. The first premium of fifty guineas has been awarded to Messrs. Castle & Warren, Talbot House, Arundel Street, Strand, W.C.; the second of twenty-five guineas to Messrs. H. W. Horsley & W. F. Young, 12 Norfolk Street, Strand, W.C., and the third of ten guineas to Messrs. Wills & Anderson, 24 Bloomsbury Square, W.C. The assessor was Mr. J. S. Gibson, V.-P.R.I.B.A. The drawings will remain on view until Saturday next.

The academy committee of Hamilton Burgh School Board, N.B., recommend the adoption of the design of Messrs. Cullen, Lochhead & Brown, architects, Hamilton and Motherwell, for the new academy which is to be built at Auchincampbell, Hamilton. There were thirty sets of plans from architects in Lanarkshire (including Glasgow), to which area the competition was confined. Mr. Bell, president of Glasgow and West of Scotland Institute of Architects, was the assessor. This design shows a building costing approximately 35,000*l*.

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The Architect.

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FORTHCOMING EVENTS.

Tuesday, October 19.

British School at Athens: Annual Meeting. Professor Gilbert Murray in the chair.

University of London: Carpenters' Company University Lectures on Architecture. Public inaugural lecture of this course by Mr. Halsey Ricardo, F.R.I.B.A.

Wednesday, October 20.

Royal Academy: Professor Arthur Thomson begins a course of twelve lectures on "Anatomy."

Friday, October 22.

Architectural Association: Paper on the "Architectural Association's Excursion to Cheltenham and District, 1909," by Mr. F. Dare Clapham, F.R.I.B.A.

Monday, November 1.

Royal Institute of British Architects: President's Opening Address. Presentation of the Royal Gold Medal to Dr. Arthur Evans, F.R.S. Address by Dr. Evans on "Recent Discoveries in Crete."

COMPETITION DRAWINGS FOR DEPTFORD LIBRARY.

THE competition for a new branch library for the metropolitan borough of Deptford is interesting, not so much from the importance of the work as from the introduction, as far as we can remember for the first time, into the Metropolis of the principle of limitation that has now become very general in the provinces, particularly in Lancashire, limitation by geographical area of the architects permitted to compete.

In this instance only architects practising in London were allowed to send in designs for a building to be erected at the expense of London ratepayers, and although the sum to be expended, 4,500*l.*, is not a large one, the metropolitan borough of Deptford has reason for satisfaction at the response to its invitation. Sixty designs were submitted, and although, as in all small competitions and some large ones, there are a number of drawings evidently the work of tyros, who would be employing their time more advantageously in making designs under the supervision of a master in a school or studio, there are very many excellent schemes and drawings which must have rendered the work of the assessor, Mr. J. S. GIBSON, particularly difficult in selecting the best.

The nature of the problem did not admit of many solutions of a satisfactory character that should depart from the fairly obvious type adopted by the winners, and accordingly most of the meritorious designs follow this treatment more or less closely. Indeed, this was so obvious and simple that several competitors seem to have thought it too easy, and endeavoured to depart therefrom by introducing various quips and cranks that have shown their ingenuity but ruined their chance of success.

On a narrow parallel-sided site of 50 feet frontage and about 150 feet depth, with front and back lines not rectangular with the sides, had to be accommodated the usual requirements of a branch library, news-room, lending library on the "indicator system," reference and magazine rooms, with the customary librarian's room, work room, store, staff accommodation, and caretaker's apartments. Light being obtainable only at front and back of the site, and the existence of some ancient lights that had to be respected, plainly necessitated a large portion of the library being top-lighted.

Desire for architectural effect has led some competitors to adopt a central entrance, but the narrowness of the site rendered it imperative for a decent plan to have the public entrance at the side. This is the disposition adopted by the winners, Messrs. CASTLE & WARREN, of Talbot House, Arundel Street, Strand. They have balanced this entrance with that for the caretaker, which is not only right as regards appearance, but enables the caretaker and his wife, as they should do, to reach their apartments without carrying their cabbages through the public rooms, as one or two competitors arrange.

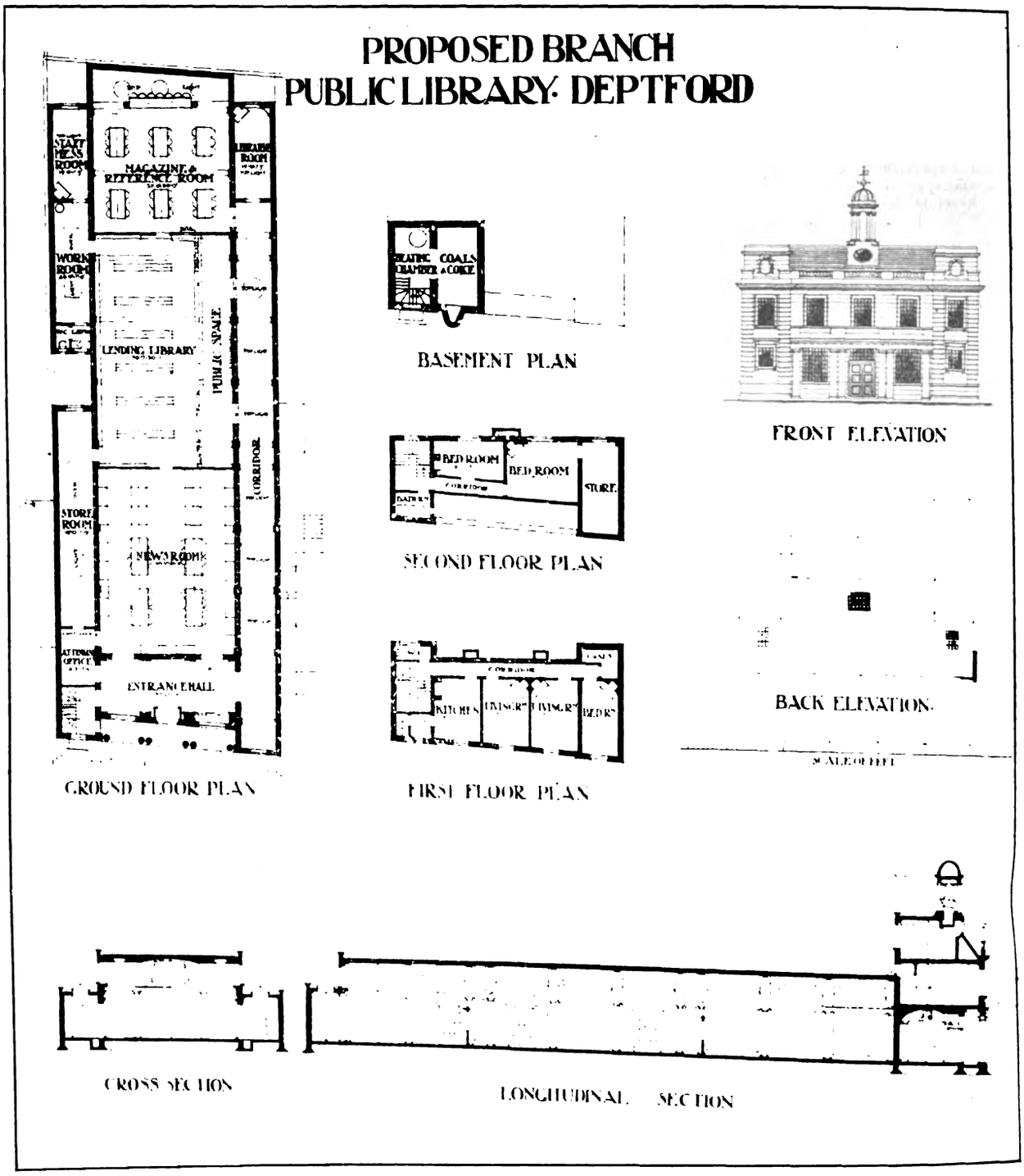
The proper place for the news-room is as near as possible to the public entrance, and both the first and second premiated designs have it in the front part of the building. Then next in necessity for ready access comes the lending library, which must occupy the centre of the site, and the rear is left for the magazine and reference rooms, which thus have the advantage of the quietude that they require.

In Messrs. CASTLE & WARREN'S design the news-room is L shaped, with dimensions of 26 feet 6 inches by 37 feet 6 inches for the main portion, and an annexe 20 feet by 10 feet 9 inches. This form is not only more pleasing than a plain rectangle, but lends itself to more efficient supervision from the staff portion of the lending library, the size of which is 26 feet 6 inches by 45 feet, cleverly arranged so that it overlooks and serves all public rooms—news-room, magazine and reference rooms. The magazine-room in the first premiated design is 31 feet by 20 feet 6 inches, and the reference-room 23 feet by 16 feet. The main corridor is a good feature in the successful plan, being 10 feet wide and comparatively short, the borrowers' space being arranged as a broadening out of the corridor. Thus a very excellent and simple plan results, and there is no question as to its suitability or superiority to others, although, as we have already indicated, there are not a few other designs which, following a similar disposition, run the accepted one very closely for pre-eminence.

Messrs. CASTLE & WARREN submit an alternative plan, of which the chief feature is a variation in the position of the librarian's room. In the primary design this is placed in a quiet and secluded position at the rear of the building; in the alternative it has a more central location. There are differences of opinion among librarians and among assessors on this point, and hence Messrs. CASTLE & WARREN were wise in proferring the alternative; but most modern librarians regard themselves as the organisers and business heads of their establishments rather than as supervisors, and hence prefer a room in which they can work quietly and with the minimum of interruption to one in which they can overlook the maximum number of departments.

The store room, work room, and staff mess room are in the first premiated design placed in the basement, whilst the caretaker's apartments, very amply and almost luxuriously planned, occupy the first floor over the front part of the building, and so help to make the elevation to the street. The treatment of the elevation is suitable and simple, in brick and stone, free from extravagance but sufficiently decorative to avoid meanness.

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THIRD PREMIATED DESIGN.—DEPTFORD BRANCH LIBRARY COMPETITION.
Messrs. Wills & Anderson, Architects.

In the case of the first premiated design, although the conditions of the competition lay down that the attendant's office is to have oversight over entrance hall and news-room, this attendant's office is placed about 45 feet back from the entrance hall, and where the attendant could not give any supervision whatever. Also the librarian's w.c. and lavatory is not in conformity with the Public Health Act, inasmuch as it is toplighted, does not abut upon any yard, garden, &c., and has no window as laid down in the bye-laws. These points have been recognised and dealt with in the second premiated design.

The second premiated design, by Mr. H. W. Horsley and Mr. W. F. Young, of Norfolk Street, Strand, closely follows that of the winners in general arrangement, and is only slightly inferior in a few points. The main corridor is 9 feet wide instead of 10 feet; the supervision from the lending library of the other rooms is slightly less complete. The attendant is placed where he commands the front door rather than the borrowers' space, where at busy times he is, we think, more useful, for with the indicator system the staff behind the counter of the lending library is rather cut off from the borrowers. The elevation of this design is superior to that of the first premiated, but it is also more costly, being wholly in stone and with a range of Ionic pilasters, and at the present day it behoves borough councillors to avoid any possible charge of extravagance in architecture, particularly when, as at Deptford, they have built a town hall that, to say the least, does not suffer from parsimony of decorative treatment.

Messrs. Wills & Anderson, of Bloomsbury Square, have once again had the bad luck to obtain the third premium instead of the first prize. Their plan, as in the first and second, has the news-room nearest the entrance, lending library in the middle, and magazine and reference room at the rear. It has also the merit of providing the staff mess room, the work room, and the greater part of the store-

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room on the ground floor instead of in the basement as in the designs placed first and second; but this involves a greater length of public corridor, an unremunerative part of the plan which is aggravated by a totally unnecessary entrance hall, introduced partly no doubt for the sake of a central main entrance and partly to get over the awkward skew line of the frontage. Their more fortunate competitors, by the way, have evaded this difficulty by sacrificing a small portion of the site. The elevation accompanying Messrs. Wills & Anderson's design is wholly in stone, dignified and severe to the point of austerity, with a colonnade between projecting end pavilions forming a portico entrance to the building. When one has only 4,500*l.* to spend there is little room for architectural luxury in a public library, and if unnecessary features either in plan or detail are introduced something else has to be cut down to pay for them.

Altogether we may regard this competition as satisfactory and a convincing proof that the public authorities of London can with advantage adopt the principle of limiting open competitions for their public buildings to architects practising in the Metropolis. We feel sure that no better designs adequately dealing with the conditions of the problem would have been received in this competition had it been made international instead of local.

We illustrate this week all three premiated designs.

NOTES AND COMMENTS.

The recognition by the laity or non-professional public of the abilities of an architect is always to us a source of gratification, and we are pleased, therefore, to note that his Excellency Osman Hamdy Bey, Director-General of the Imperial Ottoman Museum of Antiquities, Constantinople, was on October 7 presented to the Vice-Chancellor of Oxford University for the honorary degree of D.C.L. by Dr. Holdsworth, Fellow of St. John's, acting for the Regius Professor of Civil Law.

Osman Hamdy Bey is an artist who, beginning life as an architect, developed into a painter whose works have constantly been exhibited at the Paris Salon, and twice, including the present year, at our own Royal Academy. He has made his mark as the organiser of the Service of Antiquities in the Ottoman Empire and the creator of a first-rate museum of Mohammedan art opposite the beautiful Chinly Kiosk within the Old Seraglio grounds of the Ottoman capital.

When, some thirty years ago, Hamdy Bey was appointed to preside over the Constantinople Museum, the Chinly Kiosk, a work of Persian art of the time of Mohammed the Conqueror, contained little except a small part of Schliemann's spoils from Troy and a few marbles brought from various parts of the Empire. Hamdy Bey, the architect and museum director, has now in successive stages from 1887 to 1907 erected and stored a museum of the art and antiquities of Ottoman lands in a building equal, both in spaciousness and in suitability for the exhibition of art treasures, to any museum in Europe.

The promotion and supervision of all the great excavations undertaken in Turkey during the past decade has been part of the life work of Hamdy Bey, notably the German, British, French, and American explorations in Mesopotamia and Babylonia, the German excavations in Cappadocia, the British at Ephesus and in Syria, and the French at Aphrodisias.

Undoubtedly in these times of general depression and shrinkage of incomes, the burden of "the rates" is becoming intolerable, but we cannot help regretting that the Chichester City Council has resolved, although by a bare majority of one, not to spend a further sum of 200*l.* in completing the restoration, or rather reparation, of the ancient Guildhall. The opponents of the expenditure seem to have committed the city to a peculiarly ridiculous *impasse*, for some 625*l.* has already been spent and the building is roofless. It looks like the old story of the man who began to build but was not able to finish. Surely it was the duty of the City Council, as trustees both of the civic property in the Guildhall and of the finances of the city, to make sure before they started that the money could be spared to complete the work begun, the more so that Chichester being a small city the sum of 200*l.* represents, as was stated in the discussion, a rate of a penny in the pound.

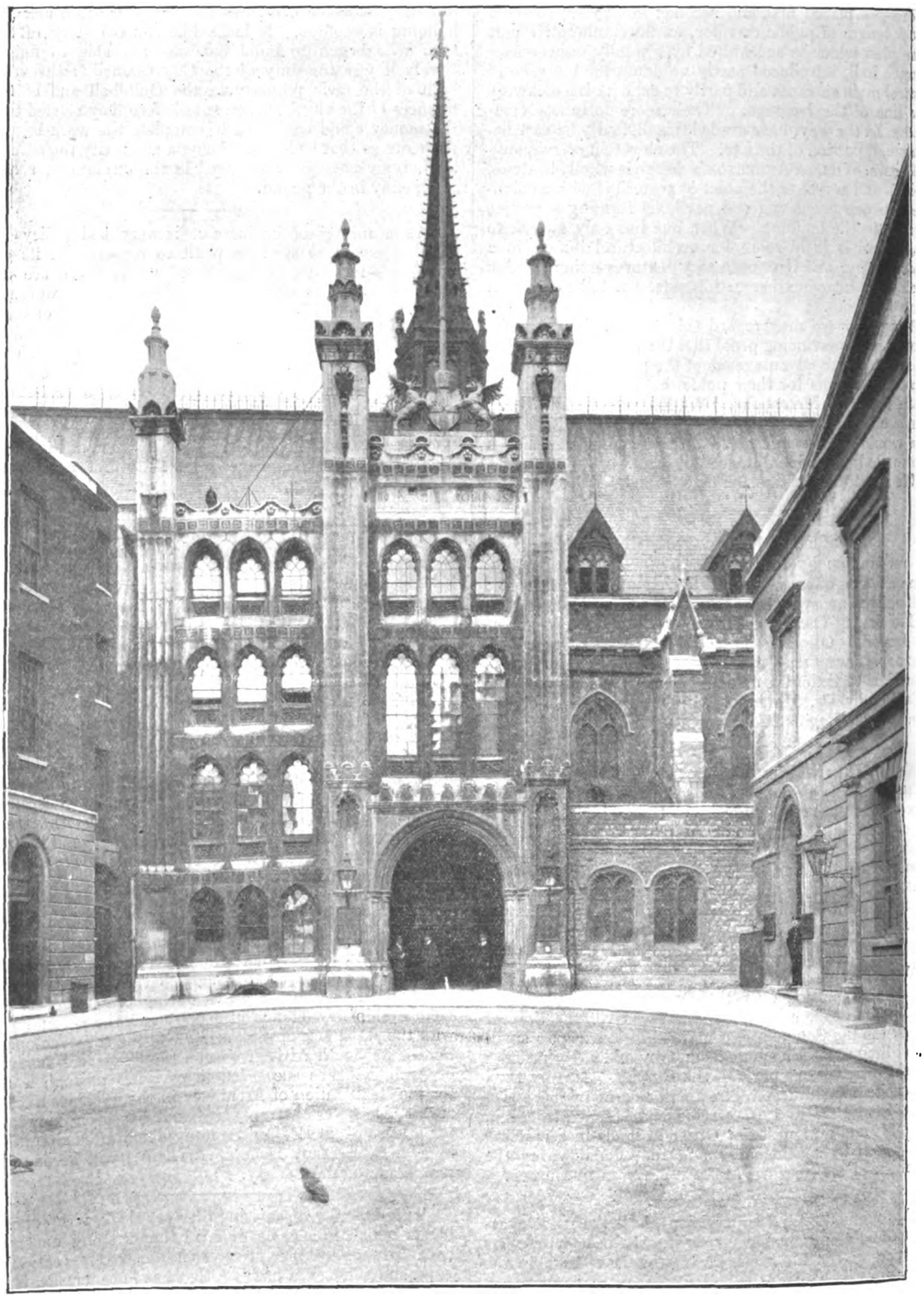
As a matter of business it is very bad policy for Chichester not to strain a point to preserve all its old buildings, for, save in Goodwood week, there are not many who visit Chichester except lovers of the works of antiquity; and Chichester, from a business point of view, ought to lay itself out to attract visiting tourists in default of other sources of income. The members of the Chichester City Council should spend their next holiday at Blackpool and study the municipal methods of that enterprising town.

The Liverpool Architectural Society, one of the oldest in the country, commenced its sixty-first session on Monday last, October 11, when a presidential address was given by Mr. T. E. Eccles, F.R.I.B.A. The Society appears from the report of the Council to be satisfactorily maintaining its position, as the number of its members has increased during the past year, and the balance-sheet shows an increase in the quite respectable balance of assets over liabilities, a balance considerably exceeding the whole of a year's expenditure. During the coming session papers will be read on "The Elements of Design in Internal Decoration," by T. R. Spence; "Reinforced Concrete and Steel Frame Buildings," by F. E. G. Badger, deputy city building surveyor of Liverpool; "The Development of Suburban Building Estates," by C. H. B. Quennell, F.R.I.B.A.; "Some Lessons from America," by Professor C. H. Reilly, M.A., A.R.I.B.A.; "The City Beautiful; or, Liverpool Compared with Cities Old and Modern," by Edmund Rathbone; "Architecture in Ireland," by Frederick Batchelor, A.R.H.A., F.R.I.B.A., President of the Royal Institute of Architects of Ireland; "Town Planning and Architecture," by Professor S. D. Adshead, F.R.I.B.A.

The twenty-fifth annual report of the Council of the Society of Architects makes note of two points on which the Society is entitled to congratulation—the first, that by an addition of twenty-five during the past year the membership now stands at 1,000; and the second, that with the assistance of the Society and the active co-operation of its South African branch the Transvaal Institute of Architects has succeeded in carrying through a Bill for the Registration of Architects in the Transvaal. The report also notes that an agreement has been completed for a lease of 28 Bedford Square, which after alterations by Mr. C. Fitzroy Doll, F.R.I.B.A., will become the new home of the Society.

The difficulty of devising a turret clock with exposed hands which is capable of good time-keeping under all conditions of weather, free from the adverse action of wind and snow, is a problem that has long puzzled horologists, who to effect a solution have for many years past applied themselves to the devising of some scheme by which, if possible, the time-keeping function of the clock may be separated from the hand-driving mechanism. An electrical turret system has now been invented by Messrs. Gent & Co., of Leicester, by which an entire dissociation of the time-keeping and hand-driving functions is effected. A full description of the mechanism of this system is given in the *Journal of the Society of Arts* for September 17. An installation of the system, known as the B.P. Patent Time Transmitter, has been made at the Merchant Venturers' Technical College at Bristol.

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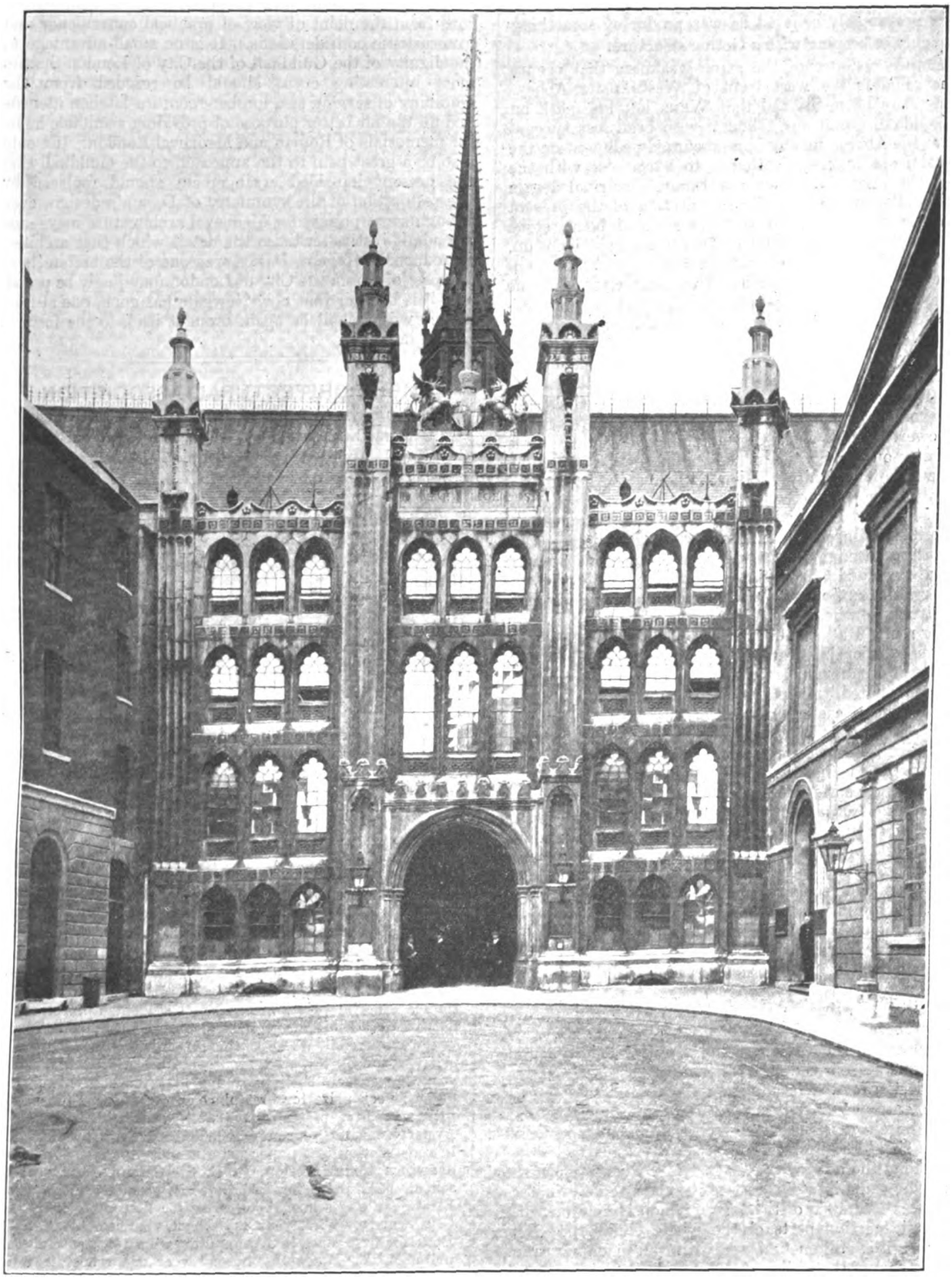


FRONT OF GUILDHALL, LONDON, AS AT PRESENT

PROPOSED IMPROVEMENT OF THE GUILDHALL, LONDON.

THE recent discovery of two fifteenth century windows in the Guildhall—concerning which an illustrated article appeared in our issue of September 24—acted as a reminder of the many vicissitudes through which the official palace of the Corporation of London has passed since its erection in 1411. The Great Hall, as it now stands, embodies the efforts of successive generations towards the maintenance and worthy improvement of this all-important part of the City's headquarters. The lower portions of the walls date back five centuries, as was shown by the windows mentioned above; while the open timber roof is just forty years old. This gathering together of

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FRONT OF GUILDHALL, LONDON, AS PROPOSED.

many different periods is still further exemplified by the façade that terminates King Street and which forms so familiar a landmark. The porch which gives access to the Great Hall is part of the original structure. Superimposed on it and to the west of it is the front designed by George Dance the Younger in 1785, which completely masks the Hall behind. The portion to the east of the entrance is altogether unlike that on the west, and was one of the many changes carried out by the late Sir Horace Jones in 1868. As will be seen from our photograph, the presence of the Great Hall is revealed on this side by something more than the ridge of a high roof behind, for there are exposed the buttresses, windows, and dormers.

The incompetence of some masters in one style of architecture to understand the details of another is most

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strikingly revealed by this maimed front. George Dance presumably believed he was producing something thoroughly in keeping with a Gothic structure.

Another instance of the same weakness that occurs to the mind is the west front of Westminster Abbey. It may here be mentioned that Wren left his mark on the Guildhall porch also, though with even less success than at the Abbey, for his Classic curved pediment on the original front makes no attempt to harmonise with the rest. The oriental character of Dance's original design was slightly subdued by the substitution of the present finials for what have every appearance of being stone palm branches. But whatever Dance did or did not do, he cannot be accused of initiating a front which concealed the fine Hall behind it. That fault was, for some unaccountable reason, perpetrated by the original designers, who, like so many of the English mediæval architects, seem to have given no thought to the dignity gained by a building when set down in an open space which would allow the eye to see it as a whole instead of in fragments. The present approach from Cheapside is altogether unworthy of a building in which are centred the powerful guilds of the City of London. Contemporary architects on the Continent had far more exalted notions of the fine opportunity offered by their trade halls. Yet even the present approach, poor as it is, was not provided until 250 years later, when the Great Fire prompted the authorities to improve upon the work of their predecessors by cutting through the mean houses that stood between the entrance and Cheapside.

Sir Horace Jones indelibly connected his name with the structure when he designed the existing noble open timber roof. But, seemingly, he wanted to leave his mark on the exterior likewise. Beyond doubt, he was quite capable of producing a front that was of better Gothic than that contributed by Dance. What he actually did was to pull down the eastern portion and leave the other two-thirds standing as they are to be seen to-day. An entire lack of balance at once resulted. If he believed that he was bringing to light the original structure he was mistaken, for excepting detached pieces of stonework in the buttresses, it is all new compared with the date of the Hall's erection. It is difficult to understand the motive of his action. Dance's front is obviously bad Gothic; but it was, at any rate, in harmony with itself, and after sixty years had become part of the history of the building.

It is now proposed to undo Jones's work and revert to Dance's design. The scheme does not arise out of any sentimental desire to impress the beholder. It is merely a practical solution to the ever-increasing difficulty of providing necessary accommodation for the Guildhall officials. Mr. Sydney Perks, F.S.A., the City surveyor, has prepared plans for the erection of three storeys over the library corridor and carrying them for a short distance between the Art Gallery vestibule and the Great Hall. The design for the façade is similar to and completes the main entrance as put up by Dance. Apart from the æsthetic effect, it is extremely desirable that such extra space should be provided.

Among the improvements that Mr. Perks has effected since he came into office there is not one more important than his clearance of the crypt, which is now one of the most interesting parts of the whole Guildhall. Nevertheless, it is still encumbered with iron machinery ranged round part of the walls. At first sight these may be taken for mediæval torturing appliances wherewith reluctant citizens were induced to contribute to the City's welfare. However, they prove on examination to be merely mechanical aids to the preparation of the banquets served overhead. Under their real character of ovens, sinks, and grills they are incongruous in the crypt, and would be far better hidden away in the proposed additions. Their place would be taken by the overflow from the adjacent museum, including the Roman masonry that is now stacked in a dark corner outside. The museum leads directly into the crypt, and the visitor would pass from the museum through the crypt and up the staircase into the Great Hall above.

Thus the scheme now proposed is to be commended both from the point of view of practical convenience and from artistic considerations. It is no small advantage to the dignity of the Guildhall of the City of London that its most interesting crypt should be rescued from the ignominy of serving as a lumber-room for kitchen utensils and fill the far better purpose of providing a suitable home for memorials of Roman and Mediæval London. It would also be a great gain to the approach to the Guildhall that the present lop-sided arrangement should replaced by the restoration of the symmetry of Dance's design, even though some purists for Mediæval architecture may—and we admit justly—criticise the detail which that architect introduced. George Dance was one of the architects of the past of whom the City of London may justly be proud, and it is but fair that now Newgate has gone, one at least of his works shall be again brought back to the form in which he left it.

THE ARCHITECTURAL ASSOCIATION.

THE opening meeting of the Session 1909-10 of the Association was held on Friday evening last in the premises of the Royal Architectural Museum, Tufton Street, Westminster, Mr. Henry Tanner, F.R.I.B.A., president, in the chair.

The Hon. Secretary announced a meeting of the Debating Society on October 15, at 7 p.m., when Mr. E. Greenop would contribute a paper on "Competition—Open v. Limited." He also gave notice of an exhibition of sketches in connection with the Camera and Sketching Club, to be held on October 21, at 8 p.m.

Messrs. R. V. T. Sewell, S. M. P. Sheppard, H. C. Hunt and E. C. Francis were elected members of the Association.

On the motion of the President a vote of thanks was passed to Mr. James Williams for presenting a water-colour drawing by Girtin.

The President then distributed the prizes and medals gained by students in the examinations.

Prize List.

A. A. Travelling studentship, value 25*l.*, and medal, G. G. Wornum. Second prize A. A. travelling studentship, value 5*l.*, C. G. Boutcher. A. A. Essay prize, value 10*l.* 10*s.*, and silver medal, H. F. Murrell. Banister Fletcher bursary, value 26*l.* 5*s.*, and silver medal; book prize for first place, advanced physics, W. J. Durnford. Architectural Union Company's prize, value 20*l.*, L. M. Gotch. Hon. mention, Architectural Union Company, and special prize, value 5*l.* 5*s.*; book prize, fourth year evening school, B. F. Matthews. Special prize, Saxon Snell studentship, value 10*l.*, R. Cromie. Elementary class of design prize, value 3*l.* 3*s.*, and bronze medal, W. D. Cathcart. Advanced class of design prize, value 5*l.* 5*s.*, and bronze medal, Alan Snow. First year day school, book prize for first place in history test paper; book prize for first place in construction test paper; prize for first place in perspective drawing test, E. L. Apperly. First year day school, book prize for first place in construction test paper; studio prize for best portfolio of drawings during session, R. C. Stevenson. First year day school, book prize for first place in geometry, T. F. Ford. First year day school, book prize for first place in physics, C. Rowntree. First year day school, volume of A. A. Sketch Book for first place in freehand drawing test; special studio prize, A. E. Maxwell. Second year day school travelling studentship, value 15*l.*; book prize for first place in intermediate physics, F. A. Crouch. Second year day school, first place in "End of session test," H. B. Chisholm. Second year evening school, scholarship, value 15*l.* 15*s.*; book prize for first place in preparatory physics, D. J. S. Dawson. Second year evening school, book prize, H. D. Kidd. Second year evening school, master's prize, H. V. C. Curtis. Third year, evening school studentship, value 15*l.*, P. D. Hepworth. Third year evening school, book prize, H. E. Moss. Third year evening school, master's prize, H. A. Gold. Fourth year evening school, travelling studentship, value 15*l.*, C. A. Farey. Fourth year evening school, master's prize, R. M. Pigott. Book prize for first place in elementary construction, Norman Keep. Book prize for first place in geometry, G. H. Inman Book prize for first place in Greek and Roman

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architecture, G. M. Eaton. Book prize for first place in Greek and Roman architecture; book prize for first place in Renaissance architecture, R. N. Jackson. Book prize for first place in Early Christian and Gothic architecture, C. W. Rogers. Book prize for first place in English architecture; book prize for first place in materials, P. J. Adams. Book prize for first place in drainage, H. A. Thomerson. Book prize for first place in ventilation; book prize for first place in iron and steel construction; book prize for first place in advanced construction; book prize for first place in architectural features; book prize for first place in professional practice, G. Flint Clarkson.

The following students have been recommended by the Visitor, Mr. Ernest Newton, for the Board of Architectural Education Certificate, which entitles them to exemption from the R.I.B.A. intermediate examination:—R. W. Cable, G. F. Clarkson, C. A. Farey, A. V. Sutherland Graeme, G. W. Home, G. D. Gordon Hake, L. Keir Hett, T. A. Lodge, B. F. Matthews, C. E. Fellowes Prynne, I. M. Pritchard, R. M. Pigott, A. D. Robinson, F. H. Swindells, and E. J. Tanner.

The following students have been awarded the Association two years' course certificate:—E. S. A. Baynes, A. G. Butler, J. A. Cheston, H. B. Chisholm, F. A. Crouch, B. P. Gaymer, J. O. B. Hitch, L. D. Martyn, E. W. Mountford, C. W. Rogers, S. E. Shurmur, R. Talvalker.

President's Address.

Gentlemen,—In addressing you to-night, as is the custom for your President at the first meeting of the session, I am deeply sensible both of the honour you have done me and the responsibility which you have laid upon my shoulders—a responsibility which, without the help of many kind friends interested in the Architectural Association, I should not feel capable of undertaking. Knowing the loyal support which I shall receive from everyone, I am sustained by the hope that I may satisfactorily discharge the duties which naturally devolve upon such a position as this, which I am indeed proud to hold.

I feel great diffidence in addressing a body of men from the bulk of whom, at any rate, I should be only too glad to learn; but I venture to aspire to at least one qualification, and that is my desire, or rather my determination, to do my utmost to advance the Architectural Association's interests in every way that lies in my power, and any work in this direction will be a great pleasure to me, as it always has been in the past, particularly to all my predecessors in this chair.

My task is made no lighter by having to follow in the footsteps of our late President, Mr. Walter Cave, who filled the office with such success and general satisfaction that he has made it very difficult for his successor to approach the standard he has set, to say nothing of acting up to it, far less surpassing it.

My only claim to be in the position in which I find myself to-night is that for some years past I have been intimately connected with the administration of this large and important institution, and, generally speaking, have some knowledge of the workings of the Architectural Association, from which experience I am able to locate our weak points, which I am happy to say I consider to be few, and also to appreciate our many good and beneficial ones, which to me seem to exceed by far the former. I do not say this with any wish to flatter the Association, but I am giving my opinion for what it is worth, an opinion gained partly by experience, and partly by the appreciation and criticism of others which I have been privileged to hear—criticism which has been directed impartially and with a desire to assist us, and not to decry our efforts.

One of the first thoughts that occurs, I imagine, to the President of a society like ours is, "What sort of a Council have I to work with?" and in my case, I am glad to say, the consideration of this point is encouraging. The Council which you have elected, gentlemen, is one which compares favourably with any of those with which I have been acquainted during my years of office in other capacities. I am sorry to say we lose a few old friends—Messrs. Louis Ambler, A. Needham Wilson, W. Curtis Green, and W. Wonnacott, all of whom retired owing to our new legislation which limits tenure of office, the idea being to change more frequently the personnel of the Council, and to introduce new blood—a procedure, however, which I feel may not always be to our advantage when valuable members are thereby removed; I trust, however, that the new members of Council will not think by my saying this that I would for one moment desire their exclusion, for, on the contrary, I most heartily welcome them all—Messrs. R. Frank Atkinson, G. Leonard Elkington, Horace Field, Gerald C. Horsley, and H. A. Hall—and trust that they will find the work here as interesting and engrossing as the rest of us.

In Messrs. F. Dare Clapham and C. Wontner Smith I am endowed with two right hands, and in further adding to my support Messrs. Maurice E. Webb and Edwin Gunn as hon. secretaries the fickle goddess has dealt very kindly with me; for with these men and the rest of our very able Council at my back I am certainly well equipped (as far as the help of others can be desired) to deal with any knotty problems that may claim our attention during the session. The permanent staff, headed by Mr. Driver, whom I may refer to almost as an Architectural Association institution, has during my experience of it served us consistently well, and will, I have no doubt, continue to do so, although the increase and the importance of the work which has to be done must be felt by them as much as by the officers and Council whom you annually elect.

The duties of all honorary officers must have been very heavy before we had such a well-organised staff, and I often wonder how the duties of the Architectural Association's President of forty or fifty years ago varied from those which have now to be undertaken; I suppose the educational branch is the largest item, apart from the fact that the number of members is nearly doubled and the necessary incidental work thereby entailed greatly increased. We have, I am glad to say, two very early Presidents still with us—Mr. T. M. Rickman and Mr. R. Phenè Spiers—both of whom I am proud to call my friends, and I only wish we could have them with us here to-night and hear their views on the changes which have occurred in the Architectural Association since they held the reins of office. Speaking of forty or fifty years ago, I should like to remind you all that it is exactly forty years ago—some years before a goodly number of us here to-night were born—that the annual excursions were started, and as a proof of the keenness of the older members, I would like to tell you that one member, Mr. John Johnson, has not failed once to attend and work as hard or harder than any of us—a very remarkable record, and I trust he will be with us many years longer to set up an even more remarkable one, though I think it is already almost unbreakable, the only men likely to get near it being Messrs. Searles-Wood, Talbot Brown, Hennings, and Clapham.

The annual excursion is not supported nearly as well as I should like; it affords a unique opportunity of visiting private houses and many other types of building under particularly favourable circumstances, and I think all who have attended will agree that the week is one full of pleasure and instruction. This rather indifferent attendance is all the more regrettable when we recollect that only a few years ago, when a particularly interesting excursion was on the "tapis," there was a clamour that places were primarily allotted to those who usually attended, which, personally, I think quite right, as consistent support should always be recognised in a matter of this sort, and one cannot help noticing that the agitators at the time mentioned have been supporters neither before nor since.

On considering the general condition of the Association, we cannot, I am afraid, be altogether satisfied at present, for although we have wiped off the building debt, our annual balance has been decreasing rapidly, and what is worse, consistently; and, indeed, so serious do we consider the position that we are proposing during this session to thoroughly investigate the finance of all our departments, and put each section as far as possible on a more remunerative basis.

Our total membership this year shows a slight decrease, as we have had 132 resignations and losses, as against eighty-four new members, and I am very sorry to say we have lost by death several old and very valued members—Mr. Gruning, who was so universally respected, probably his name appeared in the bulk of cases during the last few years as arbitrator or third surveyor; Mr. J. W. Penfold and Mr. Cole Adams, former Presidents; and Professor Hulme, who for a long time was a valued member of our lecturing staff, are only a few of those whose loss we have to deplore.

This decline in our membership I attribute to the very long period of depression through which we are at present passing, and which is affecting so very adversely the most important trades in this country, among others the building trade; of course, architecture suffers at the same time. However, the historians will tell you that history repeats itself, and we know of similar periods of depression through which we have passed which have been succeeded by a flowing tide of prosperity, which I trust will be the fortune of our country—and incidentally ourselves—in the near future.

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I am afraid that, like most professions, ours is overcrowded; but, as in other walks of life, there is always room at the top, so that we must not despair, but each of us make the top our goal, and be content with nothing short of that.

I regret that I must say that there is a certain slackness creeping in among some of the men who have done with classes and lectures, the men to whom to look to support the older institutions of the Architectural Association, the students' branches being as full of life and vigour as could possibly be desired. Every session sees the creation of some new club or section, rising, I was about to say "phœnix-like" from the ashes of its parent, but I must retract, for the parent Architectural Association is not in ashes but just a little inclined to be soporific. The most important case in point, to my mind, is that of the attendance and discussion, or lack of them, at general meetings, which ought to be far better attended. The papers for the coming session, I feel sure you will agree, are full of interest to every one of us, and I sincerely trust that the gentlemen who spend their valuable time in writing for us will have extended to them at least the courtesy of a good attendance. I have often wished that the Debating Society's meetings could be combined with the general ones, as the members of the former are undoubtedly very proficient at debate, and it would certainly be for the good of the Architectural Association generally that they should give us the benefit of their assistance.

The "Sketch Book" is not at all well supported. It does not even pay its way, and I feel sure that all here would be sorry to see the end of it, but that is what must happen unless a wider circulation is obtained. The illustrations are always good and well worth the guinea subscription. I should like to take this opportunity of thanking Mr. W. G. B. Lewis for the many years of strenuous work that he has devoted to the production of this valuable volume, and to express a hope that under the new régime recently organised it may once more recover the sound financial status that it once attained to under his care.

(To be concluded.)

THE CITY BEAUTIFUL.

ON Thursday of last week Sir Aston Webb, C.B., R.A., at Sutton Coldfield, as president of the Vesey Club, gave an address under the title of "The City Beautiful."

In his opening remarks he alluded to the dire results that have followed the uncontrolled extension of cities and towns in this country. England was behind most other countries in respect of systematic town-planning, in spite of the well-directed efforts to be seen at Bournville, Port Sunlight, Letchworth, and Hampstead. In most old cities there was a centre round which the principal buildings were grouped—the Greeks had their Agora, the Romans their Forum, the mediæval towns their market or cathedral place. Even London had fine centres at Trafalgar Square and the Mansion House, though they were not large enough to dominate the city as they should. Birmingham nearly had a very fine one, though unfortunately some recent public buildings had been scattered instead of being grouped round the Council House, and the church opposite had been removed. It was suggested that it would be better that a fine site for the Birmingham Cathedral should be acquired by one generation and the building left to the next rather than that both should be done inadequately in one.

Sir Aston Webb acknowledged the difficulty, if not the actual impossibility, of creating a new city in an old country like ours. But he pictured what might happen if a city swept away by fire were revisited fifty years later when it had been rebuilt under the guidance of a Commission of leading citizens and artists. The visitor would see something of this sort. The centre, he said, is on an eminence facing south. Round it are grouped the municipal buildings, the law courts, and the art gallery, also a municipal theatre and concert room and public gymnasium. The centre is laid out in terraces and flower gardens with fountains with plenty of water, the buildings have statues of famous citizens forming part of their architectural decoration. Trees are planted round, but regulated as to size. On the interior of the municipal hall, free to all, are emblazoned the names of local heroes who have devoted their lives to the city, as well as those distinguished in the service of the State. Above are portraits of leading citizens and frescoes by local artists of local history. From an archway in the centre of the south side of the square a great avenue some 200 feet wide starts. The centre has a double tram track with trees on either side, beyond on both sides a roadway and footways, and then a wide margin of grass. Down this avenue sites for further important semi-public buildings are found. The great avenue forms also a park-like promenade for the citizens and binds the whole city together as a unit. Outside this avenue lie the professional and commercial centres. The streets running east and west of this avenue are the shop streets with tramways down the centre. Further south is a belt of park land with a drive round the city in which are theatres and refreshment rooms, playgrounds, boating, and bathing. Beyond the residential quarter, with more shop streets running east and west, are the residential streets running north and south, so that the houses may get all the sun, for in "the city beautiful" the inhabitants believe "where the sun does not enter the doctor does." The residential portion is small in proportion, for with increased locomotion facilities more people live away; and for the same reason no huge barracks of dwellings for the working classes are required, and the factories themselves are less crowded into the towns. Two railway stations off the centre Mall, with large places in front, stop important vistas; the stations for heavy goods are in the manufacturing districts. Near the stations are the markets, one of the prettiest sights in the city. The tramcars pass through the centre of them. Churches and other places of worship are all given important positions, ending vistas or marking the junction of important roads. The design of these buildings, like all others, has to go before a commission of leading citizens and artists to ensure the general scheme of the city beautiful being retained. The schools are also on the tram routes. The manufactories are all to the north of the town, so that the prevailing south-west wind removes the smoke from the city, and the beautiful local stone remains clean and bright. To the north, in a beautiful garden, is the crematorium. In the residential quarter there is a total absence of front walls and railings, but instead grass margins to footways, and hedges mark the boundaries. Clear, bright water is sent down the road channels several times a day. No advertisements are allowed except on special places appointed for them, and even shop names and signs have to be submitted to the commission, as do all lamp posts, letter boxes, and other designs.

Such a city as that described, said Sir Aston Webb, could probably never be erected in England, but the extension of our towns could be regulated to their great advantage if strong local committees were formed in each town to rouse public opinion and to suggest to municipalities the lines on which improvements should take place.

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 18, MR. CHARLES HENRY HEATHCOTE, F.R.I.B.A.

MR. HEATHCOTE is a member of the firm of Chas. Heathcote & Sons, of Manchester, which occupies a prominent position amongst the architects of that city. The works carried out by the firm embrace a large number of manufactories, warehouses, insurance offices, banks, hospitals, and business premises, and are not confined to Manchester and its neighbourhood, but extend to Russia and Siberia. Mr. Heathcote's work embracing a large amount of engineering, he has studied his clients' interests by designing his own steelwork instead of letting the contracting engineers do it for him.

NO. 19, PROFESSOR F. M. SIMPSON, F.R.I.B.A.

PROFESSOR SIMPSON was the first holder of the Roscoe Professorship of Art to organise the now flourishing School of Architecture at Liverpool University. He now occupies the position of Professor of Architecture at University College, London, and is renowned for the excellent character of his writings as much as for his ability in teaching. He has established at University College a day school for architects.

THIRD PREMIATED DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

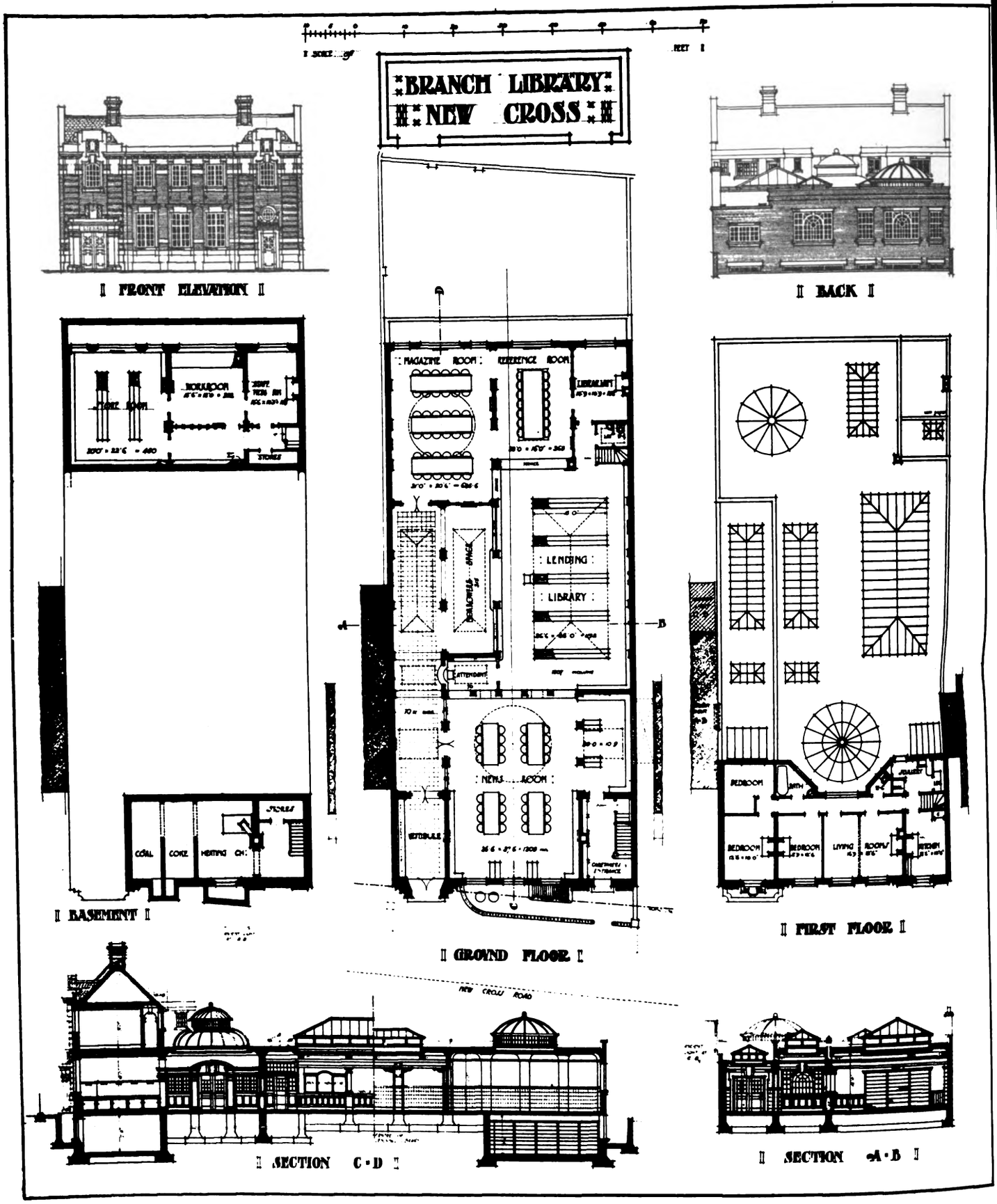
THIS design by Messrs. Wills & Anderson has already been commented upon and described in our review of the competition drawings.

FIRST AND SECOND PREMIATED DESIGNS, DEPTFORD BRANCH LIBRARY COMPETITION.

A DESCRIPTION and criticism of these designs and of the competition generally are given in our leading article of this week. The third premiated design is illustrated on p. 242.

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FIRST PREMIATED DESIGN, DEPTFORD BRANCH LIBRARY COMPETITION.

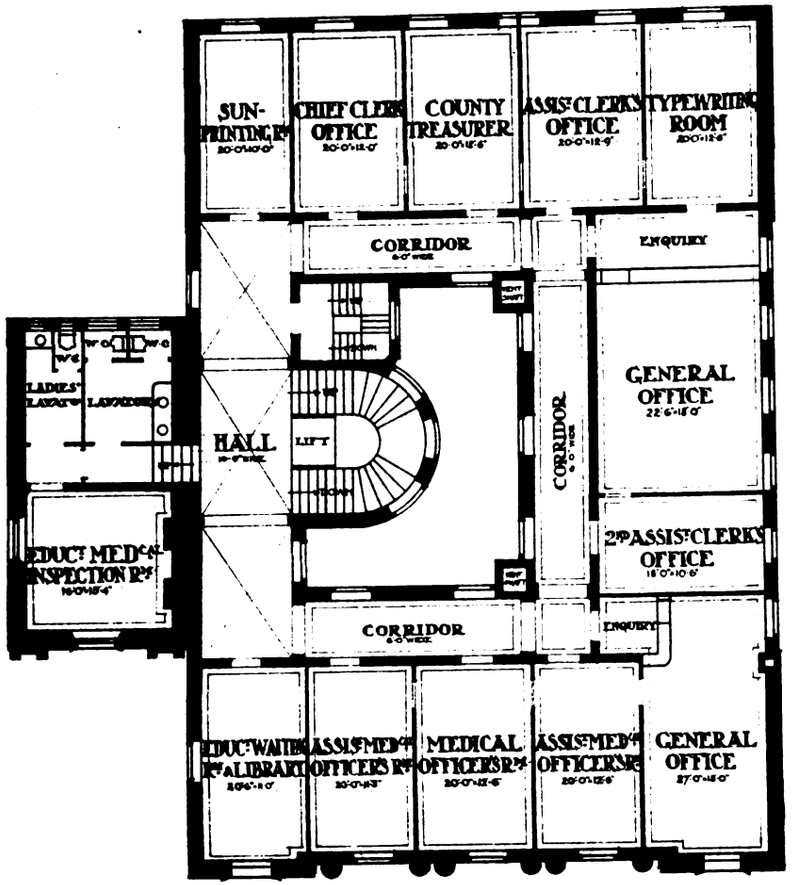
Messrs. CASTLE & WARREN, Architects.

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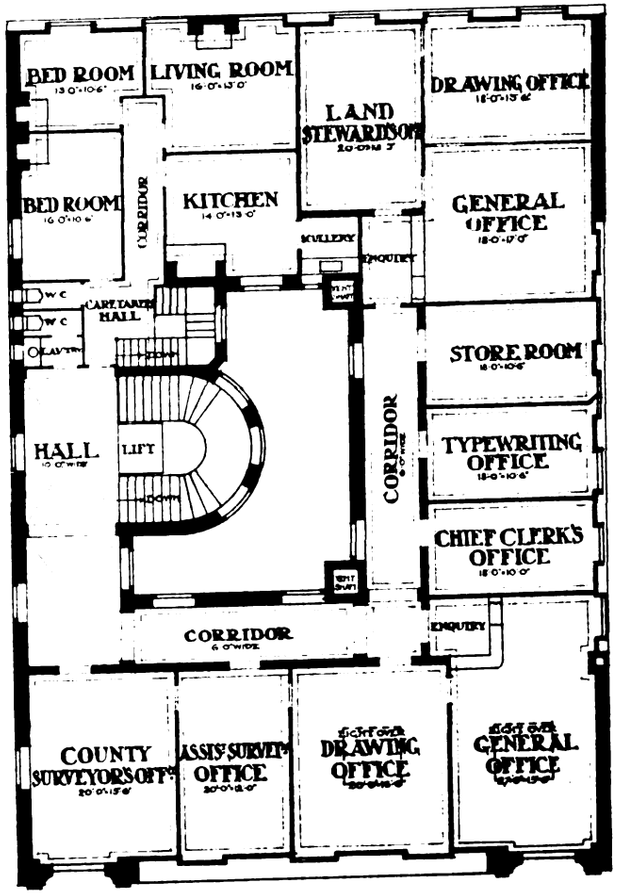




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SECOND FLOOR PLAN



THIRD FLOOR PLAN

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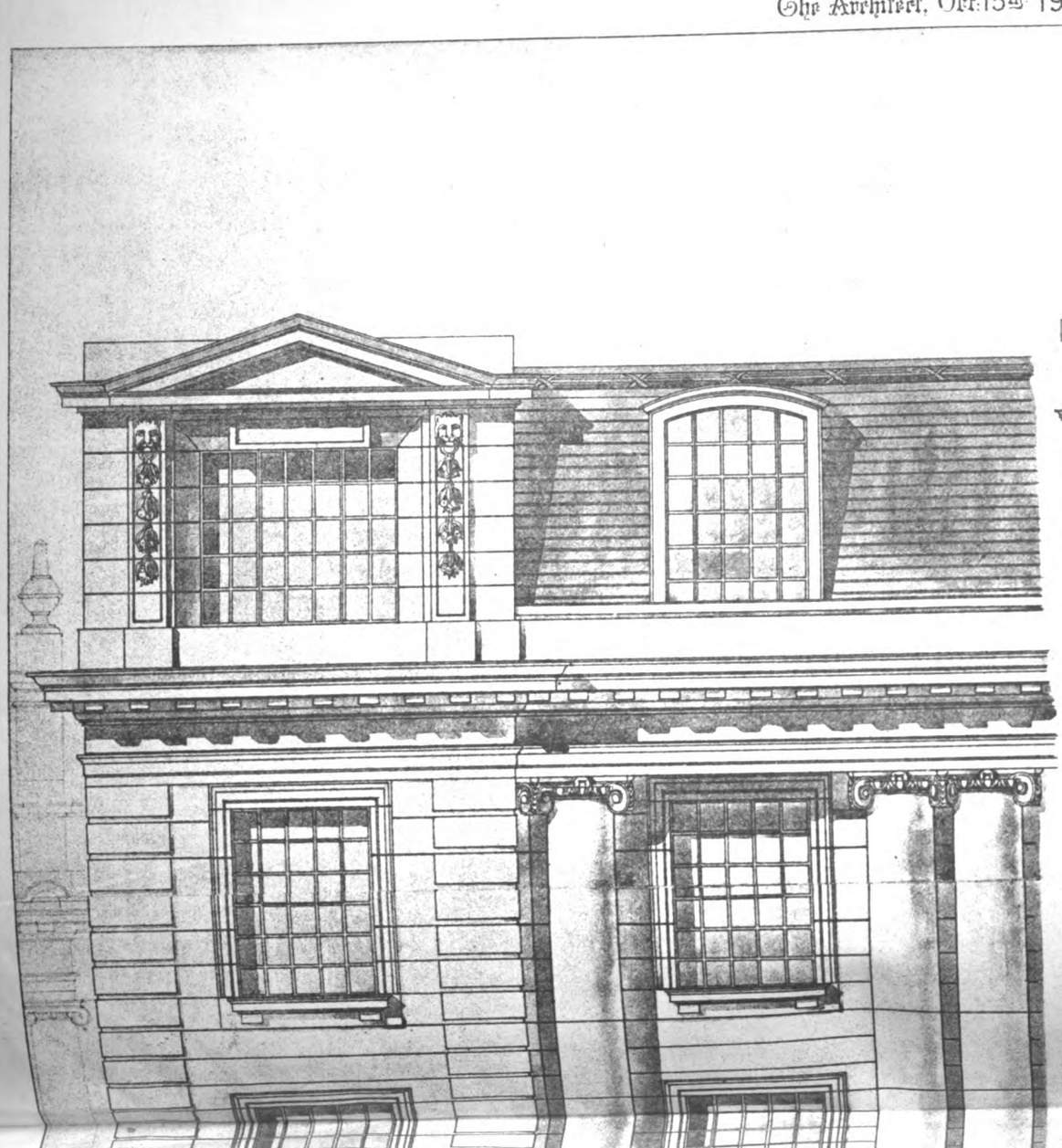
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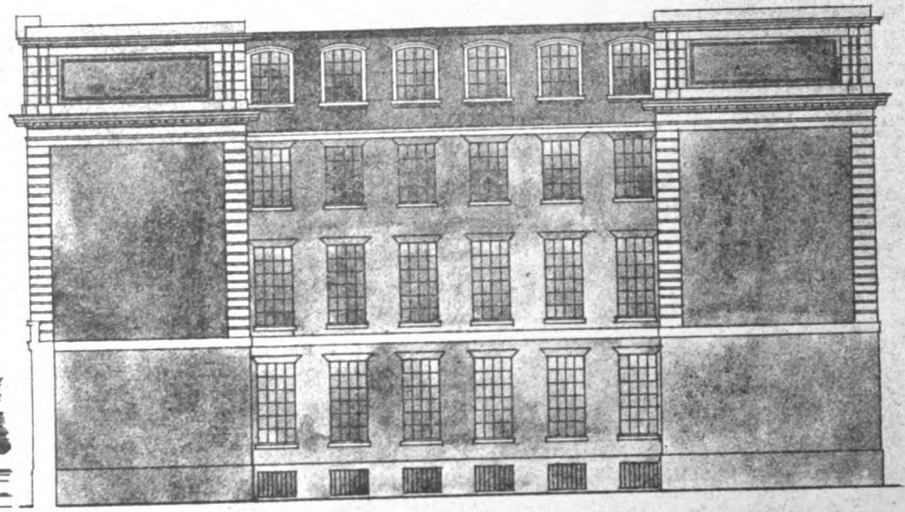


LIVING ARCHITECTS. NO. 18: MR. CHARLES HENRY HEATHCOTE, F.R.I.B.A.

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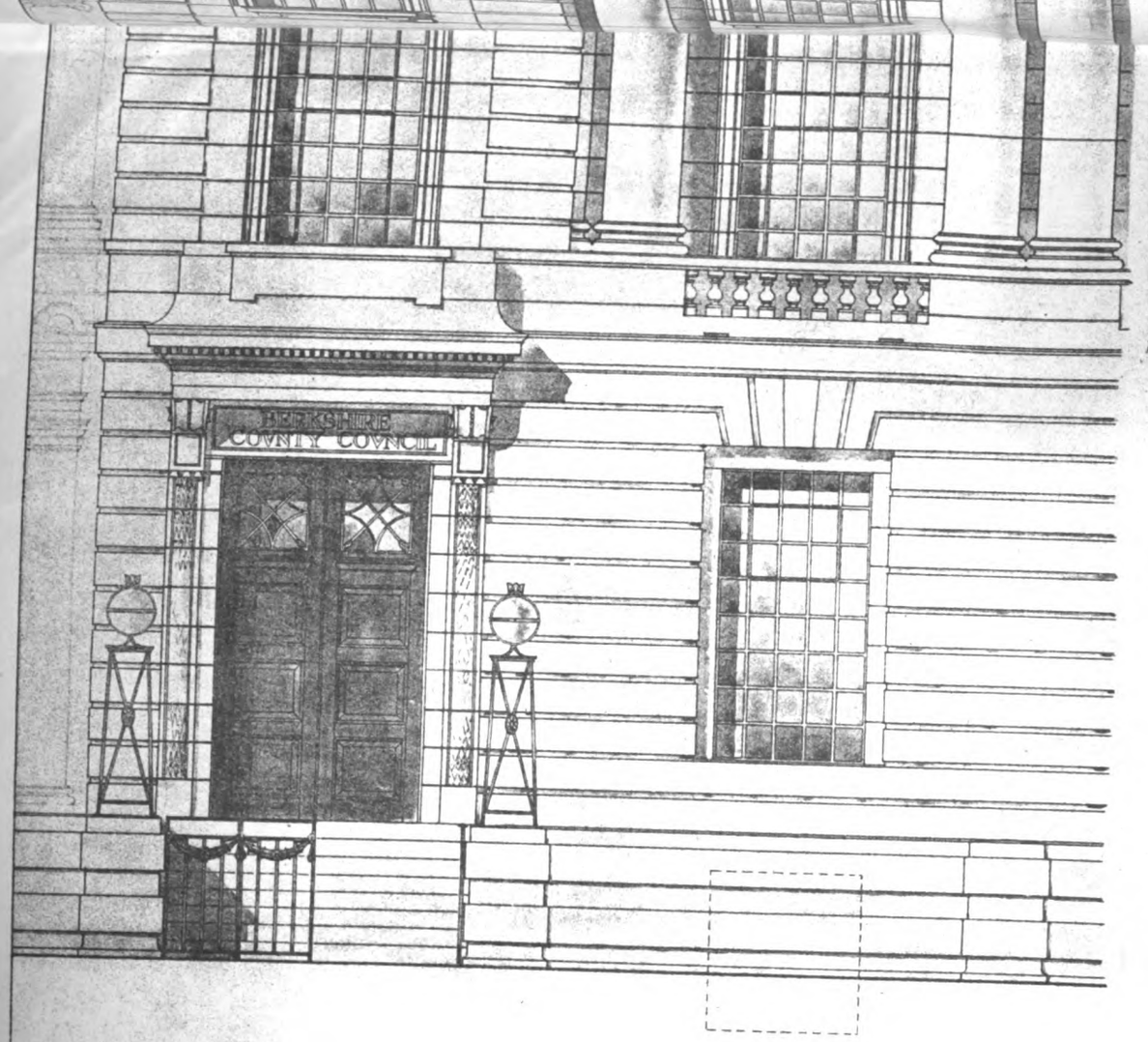


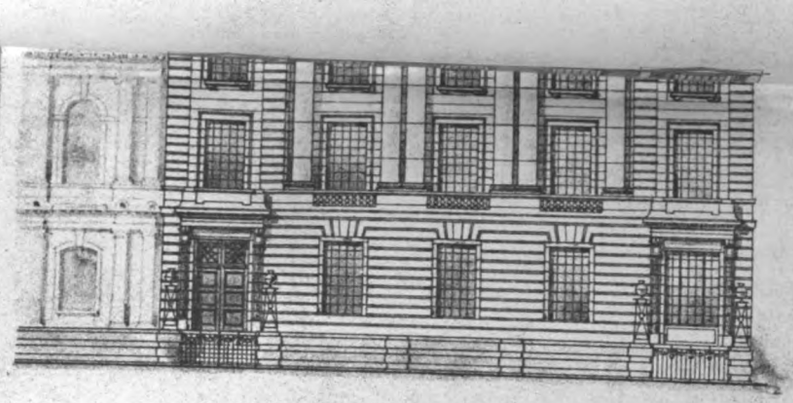


SIDE ELEVATION

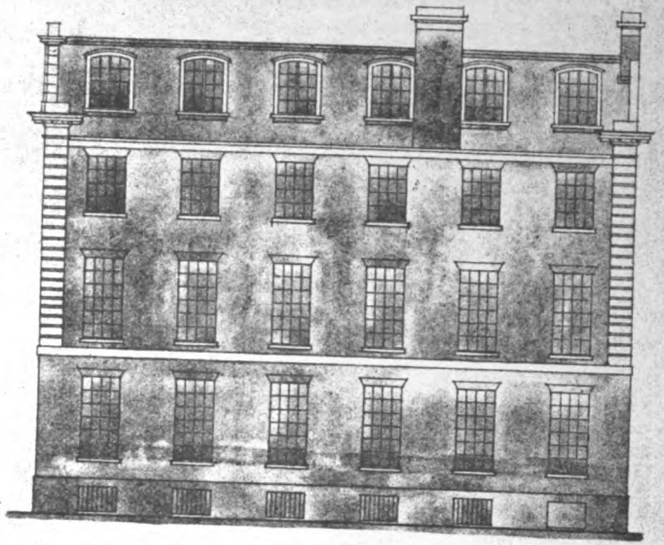


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ELEVATION TO THE FORBURY



BACK ELEVATION

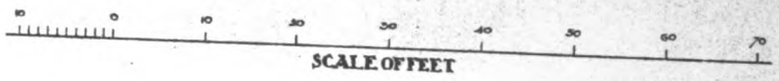


PHOTO-INK. SPRAGUE & Co LTD 4 & 5, EASTHARDING STREET, FETTER LANE, E.C.

THIRD PREMIATED DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

By Messrs. WILLS & ANDERSON.

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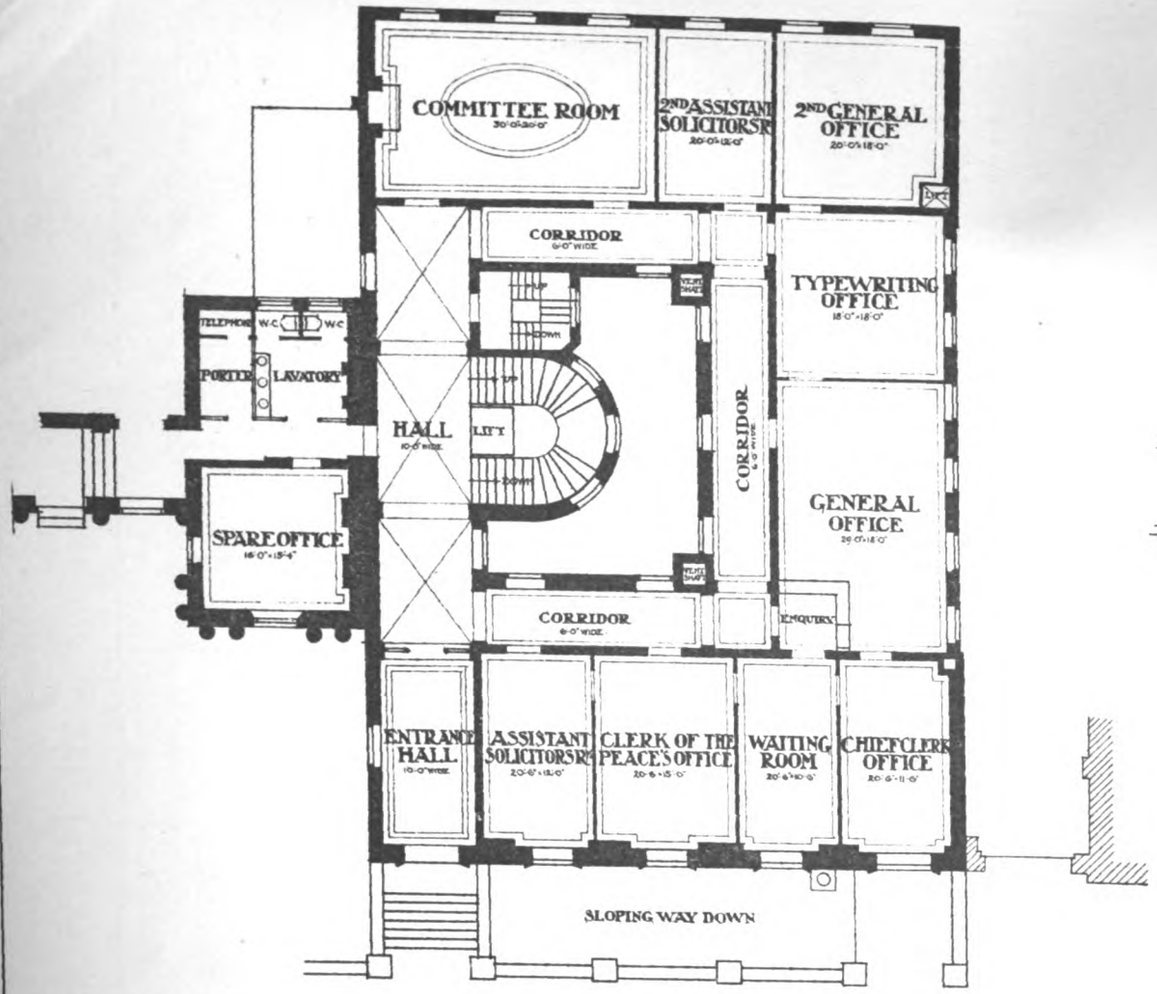


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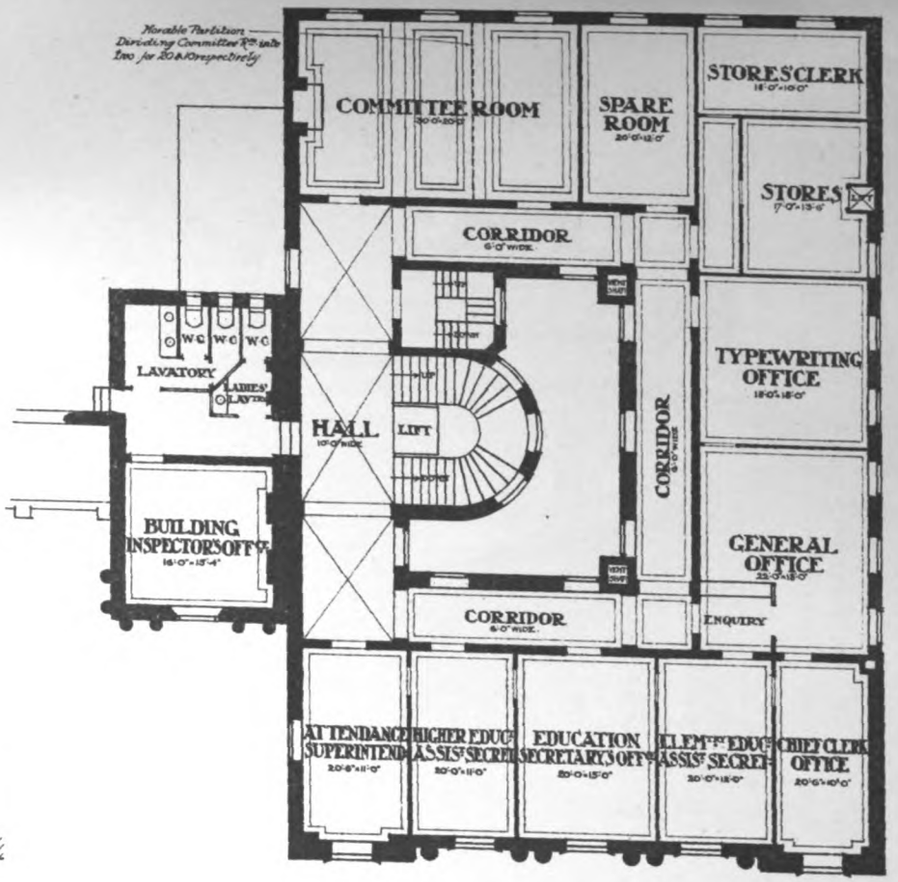
PHOTO-LITHO. SPRAGUE & C° L.D. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

LIVING ARCHITECTS. No. 19: PROFESSOR E. M. SIMPSON, F.R.I.B.A.

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GROUND FLOOR PLAN



FIRST FLOOR PLAN

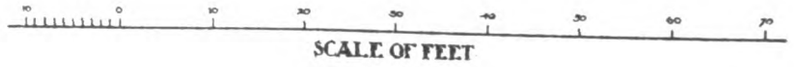


PHOTO-LITHO. SPRAGUE & C.° L.° 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

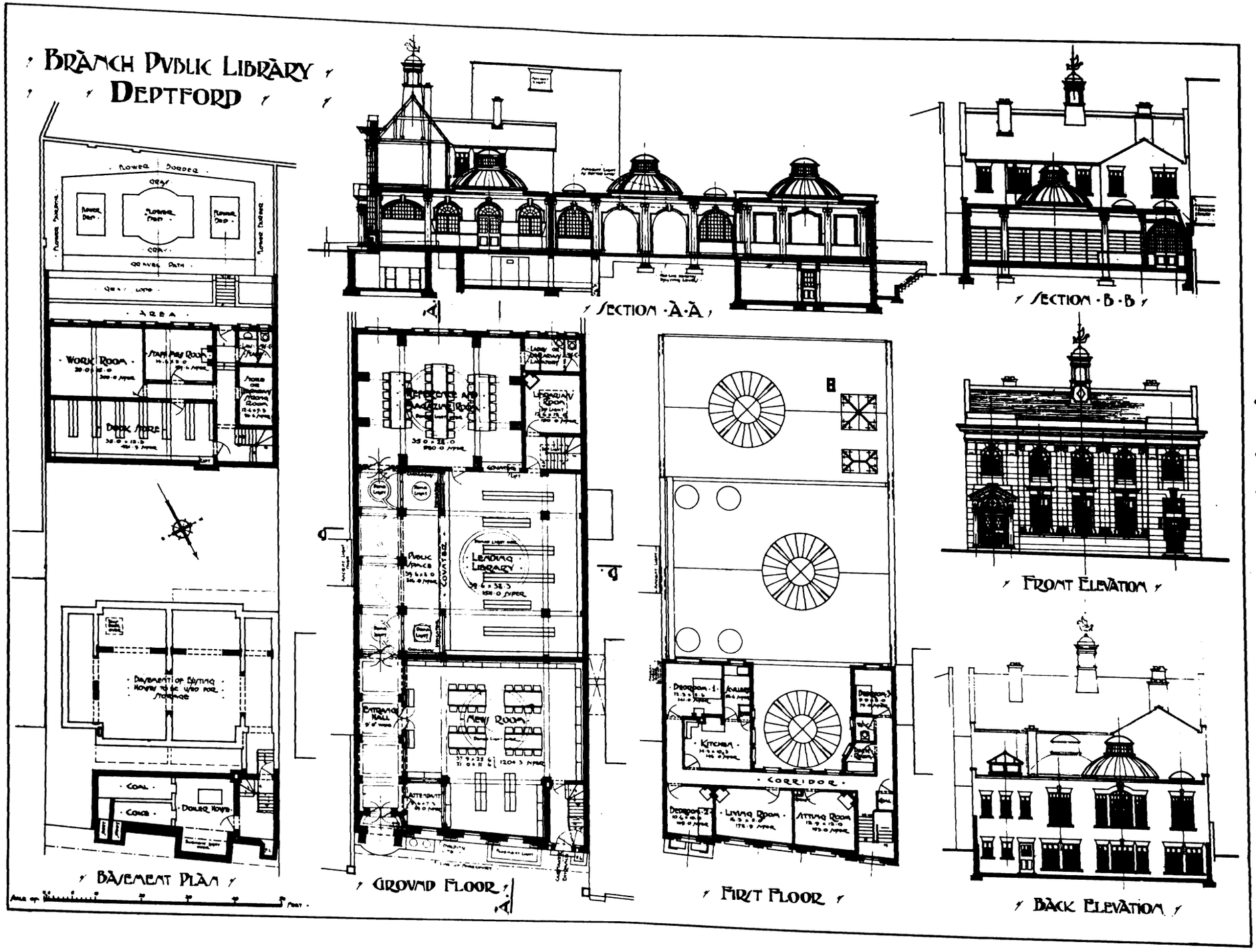
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SECOND PREMIATED DESIGN, DEPTFORD BRANCH LIBRARY COMPETITION.

Messrs. H. W. HORSLEY and W. F. YOUNG, Joint Architects.

The Architect, Oct. 15th, 1909.

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ST. ALBANS CATHEDRAL.

UNDER the title of "Saints, Benedictines, Goths and Vandals," a lecture was given on the 7th inst. before the Royal Photographic Society at the New Gallery, Regent Street, W., by Mr. E. W. Harvey Piper, Hon.M.S.A. The address was illustrated by over one hundred lantern slides, many from recent amateur photographs and others made from drawings and engravings.

The topic of the discourse was the cathedral and abbey church of St. Albans, past and present. The story of the beheading of the British proto-martyr on the hillside ledge opposite the Roman city of Verulamium was rapidly sketched, and it was pointed out that while a little church rudely constructed of wattle and mud was soon afterwards erected on the site of Alban's death, no monastery was established until 490 years later, when Offa the Second of Mercia founded a Benedictine house as an act of expiation. Thanks to the prestige accruing from the custody of the saint's bones, the abbey became one of the most prosperous and wealthy communities in the Order; its abbot was mitred, and obtained, after tussles with Westminster and with Bury St. Edmunds, precedence over every other monastic establishment in England. The monks, drawn largely from the moneyed classes, numbered one hundred against the seventy usually housed at Westminster and the sixty at Ely, Gloucester, Norwich, or Winchester. The abbey church, built largely at first of Roman bricks quarried from the adjacent and deserted Roman city, benefited by the prosperity of the monks, and while ever restricted to its original narrow dimensions, was so added to eastwards that it became one of the longest in England. The builders were always more ambitious than funds justified, and every scheme for the improvement and decoration of the abbey church was starved in execution, and left half-completed. Forty abbots in turn reigned in splendour at St. Albans from 793 until December 1539, when Richard Boreham, of Stevenage, surrendered the abbey to Henry VIII., and was, together with his monks, pensioned off. The monastery buildings, with the exception of the steward's residence or Great Gate House, and the Water Gate, now the Fighting Cocks Inn, were granted by the king to Sir Richard Lee, who utilised them as cheap materials for other houses. The church, which in 1553 had been sold to the townsfolk for 400*l*, proved far too large for their requirements or power of upkeep, and only the central portion between the rood-screen and reredos was utilised for worship. The lady chapel was converted into a grammar school, and was shut off by a public passage-way cloven through the retrochoir, walled off, and providing a short cut for townsfolk from north to south. The western part of the nave, being disused and very poorly lighted, soon fell out of repair. Three centuries of neglect brought the great abbey church into a sad state of ruinous dilapidation, from which it was rescued by three successive generations of restorers, whose zeal often outran their knowledge and discretion. Lewis Cottingham in the forties of the nineteenth century displayed the typical ignorance of his day. Sir Gilbert Scott, during the twenty years ending with his death in 1878, evidenced great constructional ability in underpinning the central tower and pushing back into place the long bulging walls of the nave clerestory, not always combined with a tender regard for priceless fragments of old work. Then followed the tempestuous reign of Sir E. Beckett, afterwards Lord Grimthorpe, who, with an absolute disregard for the feelings of others, expended 140,000*l*. out of his own pocket in strengthening the fabric, in reconstructing the façades to nave and north and south transepts according to his own devices, and in re-edifying the lady chapel. Grimthorpe's drastic works at St. Albans twenty years ago evoked the most bitter storm of condemnation, abuse, and recrimination that ever raged about an architectural undertaking. The impression which some people had derived from the severe comments on his rebuildings that the church no longer contained old features of the first importance was, however, quite unjustified.

Two salient features characterise the laying-out—firstly, the great regularity, the only break of importance being the sixteenth-century Chapel of the Transfiguration, on the south-west side of the lady chapel, and, secondly, the extreme narrowness in proportion to length. The miserable and threatening condition of the bepatched west front of Wheathampstead was illustrated, and Beckett's crude design, prepared in 1877, was shown from his autograph drawing. That this was afterwards modified by an anonymous ghost, well paid to remain in obscurity, to the more presentable form in which it was carried out was obvious from the great disparity between the authorised version and the extended work, and from the fact that Beckett was so satisfied with this crude holograph design as the best he could produce that, thirty-four months after he drew it, he submitted it to the restoration committee for their approval without alteration or amendment. As for the west front as we now saw it, it was a passable example of the class of design adopted for a prosperous Nonconformist chapel in the closing years of the nineteenth century. The conception was well thought out, the buttresses to the central gable and its three doorways being boldly advanced, and the arcaded flanking wings over the aisles, reminiscent, to some extent, of the treatment of Salisbury's west front, being set back. The great nine-light window, with its wheel head, was cleverly recessed. The hexagonal flanking turrets were kept in the same plane of projection as the main façade and ended in bold spires, which, while providing the break so much needed to the flat sky-line of St. Albans, were tactfully kept lower than the apex of the central gable. Embedded in the central portal were considerable remains of John de Cella's work of 1214. Beckett pierced the western bays with entirely new windows, to the vast improvement of the internal illumination of that portion of the nave. The aisle walls at this end were unbroken by windows till within the last five-and-twenty years, for on the south side the abbot's lodge and hall (succeeded by a caretaker's cottage) abutted upon the church, and on the north side the outlying church of St. Andrew, built for the parishioners' use in the thirteenth century, opened out of the nave by an arcade of four bays. When this adjunct was destroyed in Elizabeth's time the space of the arcade was filled with a blank wall. A further stage in the restoration was the removal of the brick aisle parapets and their reroofing—with lead—by Scott at the five western bays on the south side and on the other portions with brown tiles by Beckett. A striking illustration of Beckett's wanton iconoclasm was his treatment of the beautiful late fourteenth-century cloister arcading on the south aisle wall. When these cloisters were rebuilt—1396-1401—by Abbot De la Mere in the then fashionable 'Early Perpendicular style, the spacing of triforium and clerestory bays behind the north walls were disregarded. The pulling down of the cloisters by Sir Richard Lee in the days of Edward VI. left the arcading against the walls exposed, and the failure of these arches to synchronise with the windows above was evident. Beckett found it necessary to strengthen this aisle wall owing to the poor foundation, and constructed against it between each bay a bold, uncompromising flat buttress of flint and freestone, which disdained to accord with the old work around, and cut through the charming cloister arcading. At Gloucester in 1318 Abbot Thokey overcame a similar difficulty by the use of pierced buttresses—an expedient now being adopted at Winchester by Mr. T. G. Jackson—and it was suggested that a still better effect would have been produced by the use of more pronounced flying buttresses. It was strange that while the walls were being strengthened no attempt was made to take out and replace with rough masonry the Post-Reformation patches of red brickwork which here and there still disfigure the aisle walls. Probably if this were done many interesting fragments of carved stonework would be brought to light. It was a matter for gratitude that Sir Gilbert Scott left untouched the three easternmost lights on the south side. These openings, which illuminated the ritual choir, were shorter and smaller than the others, and were separated by broad, flat Norman pilasters built up, like most of the work of that date, of reused Roman bricks. The three clerestory windows in the western wall of the south transept are of similar early Norman character. On the other hand, Beckett enclosed the fine abbot's state doorway built by De la Mere about 1370 in a flat, projecting porch, in a style which he imagined to be Norman. But the portal was a trifling matter compared with the new façade to the south transept, with its grotesquely stiff angle buttresses with square pseudo-Norman pointed finials, and five long lancets, graduated without and uniformly stopped within the building at the ceiling level. Lord Grimthorpe, it was averred, carried the transept roof up to an unnecessarily high pitch so as to be able to boast that he had provided the longest lancets in England. Before the restoration was undertaken the eastern limb of the abbey was confessedly in a state as precarious as picturesque, while the degradation to which the fabric was subjected spoke eloquently of disregard and neglect not only of the stability but of the sanctity of the edifice. Turning to the repaired building, the sky-line was now absolutely changed. The brick battlements had disappeared alike from presbytery and transept parapets; spiky, bristly pinnacles of aggressive mien, and presumably in Grimthorpe's judgment of thirteenth century type, replaced the softened and varied outlines of the

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



HOUSE AT SCHÖNBERG IN TAUNUS.
Ludwig Bernoully, Architect. [From *Der Profanbau.*

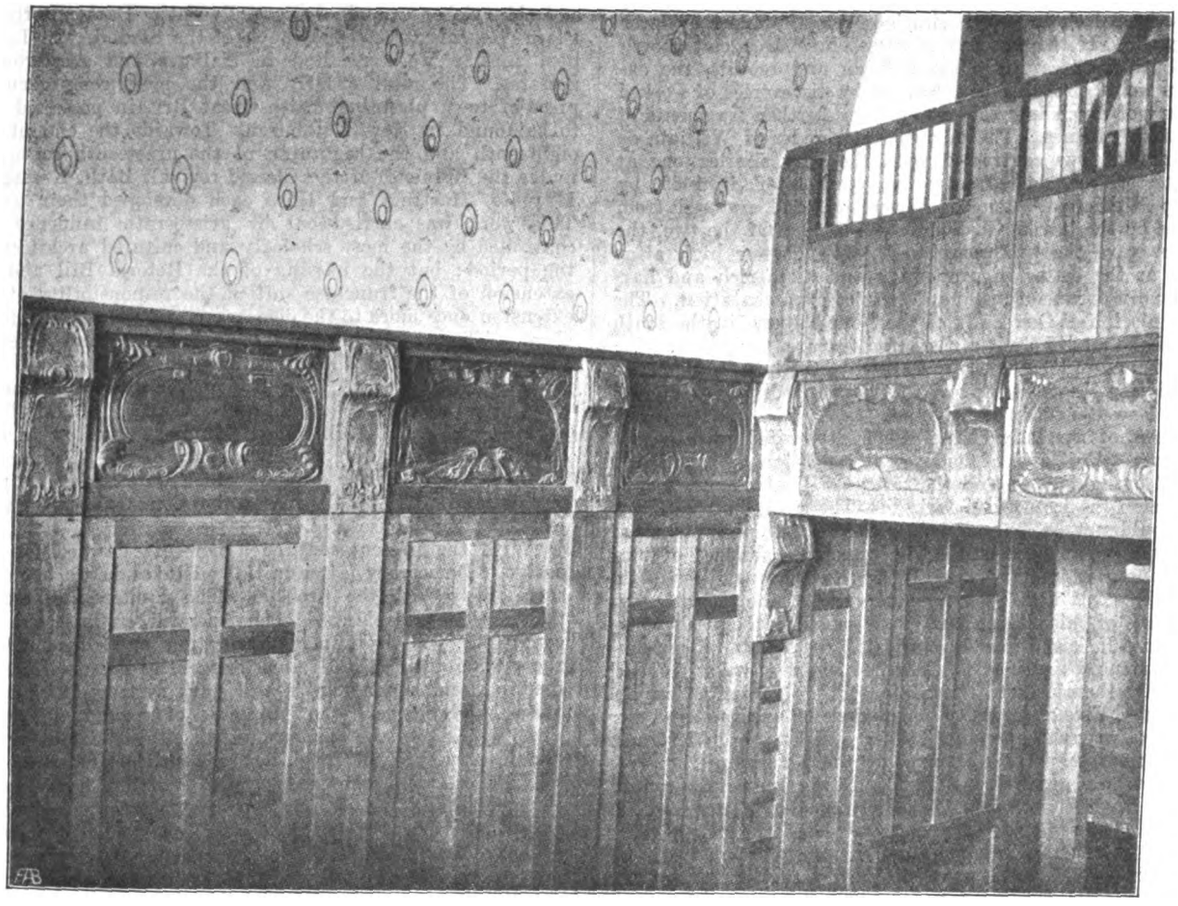
retrochoir; windows displayed new tracery borrowed from familiar textbook plates; while the north-eastern and south-eastern corners of the lady chapel were flanked by hard-featured buttresses, set at right angles like the revetments of a fortification. The walls of the little Transfiguration Chapel to the south of the main chapel had been lowered the better to clear the windows above, its east window was narrowed without obvious reason, and the chapel itself converted into a prosaic vestry. But the most startling change, apart from the transformation of the transept ends, was the new gable to the retrochoir, necessitated by the heightening of the external roof from the central tower eastwards. The additional gable at the east end contained a spherical window, cleverly adapted, it must be admitted, from those in the nave clerestory at Lichfield, but unique in its pattern. The three windows below this new light, which had long been blocked up as ruinous, were rebuilt and lengthened, and the end wall itself was prudently thickened. The lady chapel was vaulted in stone (in place of plaster), and a lead covering of unaltered pitch now replaced the mean slating. On the north side of the choir is a fine square-headed door of 1440, having shields in the haunch spandrels, in the one case charged with the three crowns of East Anglia, and in the other with the sword and key of St. Alban. In the north transept the pilgrims' portal, c. 1080, of re-utilised Roman brickwork, marks the route of pious visitors who, turning in from Church Street, bought their blessed candles there at the Waxhouse Gate, passed through the passage now misnamed the cloisters, and so by this doorway into the transept, and having viewed the shrines of Saint Alban and Amphibalus, and made their offerings, left by a doorway (now blocked up) in the south choir aisle. By working night and day, Sundays included, workmen under Chapple, by underpinning and grouting, prevented the imminent collapse of the central tower, the grandest and noblest feature of the abbey. At that time, 1870, Sir Gilbert Scott found that the mortar and filling of the tower piers had crumbled into dust, which was oozing through the cracks, and closer investigation showed that probably just after the Dissolution a deep hole had been cut in the south-eastern pier and filled with timber, now partly decayed, doubtless with the intention of lighting the wood and so felling the steeple. The tower was originally coated with plaster. This was renewed by Scott, but was afterwards scraped off the red brick surface.

The lecturer, discussing the general result of the restoration on which Grimthorpe expended like water the fortunes

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MODERN EUROPEAN ARCHITECTURE.

GERMANY.



DETAIL FROM HALL OF HOUSE AT SCHÖNBERG IN TAUNUS.
LUDWIG BERNOULLY, Architect. [From *Der Profanbau.*

he inherited, married, and made, held that they were indebted to the generous but self-opinionated and scantily-qualified benefactor for having soundly repaired the fabric, for putting in good foundations, and insisting upon sufficiently thick and well bonded walls and honest workmanship. It was improbable, had he not volunteered to the rescue, whether the funds for the absolutely essential structural works would have been forthcoming. Going into details, the lecturer held that the partial rebuilding of the lady chapel, its vaulting in stone, and its internal panelling and carving were admirable; the problem of the retrochoir was successfully treated; the west front was fair Late-Victorian work, but the cloister buttresses and Norman portals were blunders, and the rebuilding of the south wall of the transept with a novel, exotic, and uncongenial group of Brobdingnagian lancets, and the destruction of the character of the slype that abutted upon that wall were deplorable evidences of lack of judgment; while words could not be employed to express indignation at the inane, ignoble ignorance of the north transept "rose" window.

Examining from the entrance the north and south arcades by turn, the juxtaposition of Trumpington's Early English bays at the west end with Paul de Caen's heavy Norman piers and arches on the north, and with the elegant and enriched fourteenth-century ones of Eversdon and Mentmore on the south side, a rebuilding necessitated by the collapse of part of the southern arcade on October 10, 1323, was pointed out, and it was shown how closely those who reconstructed the work tried to assimilate it to that executed at the west end of the nave 120 years earlier by Trumpington. Turning westwards, the effect of Grimthorpe's end windows and new roof were admitted to be fairly satisfactory, while the greater stability and improved lighting of the aisles were very apparent. The unfinished pier bases put in by Trumpington at the west end showed his preparations for vaulting the nave, an undertaking which was happily abandoned, for the bad foundations and thin walls would certainly have resulted in the wrecking of the fabric had a stone vault been imposed upon them.

In the south nave aisle were seen the rich Late Decorated portal built by De la Mere in 1370 to serve as the abbot's state portal from the cloisters; the recessed tomb, c. 1455, marking the burial-place of the hermits Roger and Sigar, who flourished in the reign of Stephen. Proceeding into the south transept, Grimthorpe's alterations were only too evident; a passage-way in the west wall from the cloister has been converted into a cupboard, wherein is stored weekly the bread given to the poor under the will of Robert Stretton, 1628; the lockers in which the loaves are kept are small livery chests, the one hung on the north wall being of Elizabethan craftsmanship, the other on the west wall facing the doorway contemporary with the institution of the charity. The slype east and west entrances were also blocked up by Grimthorpe, and it has become a mere recess in the south wall of the transept; part of the original arcading is left on the south wall, while the other half-dozen intersecting arches are set up as an ornamental frieze on the south transept wall, below the "Five Sisters" lancets; the original western entrance to the slype, richly decorated Transitional work of 1140, now forms the central feature beneath these windows. The Saxon balusters in the triforia of the transepts seem to be relics of the earlier church built by Abbot Eadmer in the ninth century, and were probably incorporated into Paul de Caen's walling to demonstrate the historical continuity of the reconstructed church.

A series of three illustrations of the transepts looking to the north was successively thrown upon the screen to illustrate the changes effected during the past century. The first, an engraving by F. Nash, 1804, showed the crossing and transepts, encumbered with ramshackle, inartistic fittings. The second view was a photograph taken in 1870, when all the cumbrous Georgian furniture had been cleared away, and the whole area was left as a barren wilderness. The third, from a recent photograph, showed the present aspect of the transepts, relevelled, repaved, and receiled, the broad space broken up to some extent by open seats in the crossing. Looking from the ritual choir over the crossing eastward the chantries of Ramrygge and Wheathampstead were seen in

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detail, illustrating the advance in style during the sixty years which intervened between their erection, and also the very fine brass of De la Mere, now secured on the altar slab of Wheathampstead's tomb. Here, as at Rochester Cathedral, the structural choir area is shut off from the aisles by later solid walls. If the masonry in these blank arcades to north and south were carefully taken down and rebuilt, the explorers would probably be rewarded by discoveries of worked masonry of much interest—possibly by further fragments of the saints' shrines. The magnificent reredos of William de Wallingford was contrasted with the very similar one at Winchester, constructed some five years later, in 1485, by Bishop William Patten, of Waynflete, and restored from designs by the late J. D. Sedding in 1890. Of the two, the lecturer gave the preference to the Winchester high altar screen as the better in proportion and more rich and harmonious in arrangement and details of ornamentation. The triple piscina of Our Lady of the Four Tapers, in the south wall of the retrochoir is a charming feature, and the carving in its tympanum evidently suggested to the late G. E. Street a motif for the treatment of the tympana of the great hall of the Law Courts in the Strand.

Views of the lady chapel when desecrated by use as a grammar school and of its present condition as practically rebuilt brought to an end the series of illustrations, and in conclusion the lecturer remarked:—The study had not been, and could not be, exhaustive. St. Albans presents many problems yet to be solved. The numerous changes of plan and construction have not all, by any means, been satisfactorily explained. Then, on the site of the monastery to the south of this church, and imprisoned in the walls of the abbey itself, are probably concealed fragments of masonry and carving which may possibly be of intense value. Much remains, therefore, to stimulate further investigation and thought. Five-and-twenty generations of workers and worshippers wrought upon the fabric, and have each left upon it their own impress. Inspired by the memory of the protomartyrs, and utilising afresh building materials contemporary with those saints, Benedictines, Goths, and even the Vandals of our own time contributed to render this edifice a very storehouse and treasury, a veritable handbook and encyclopædia of architecture of every period from the Saxon kingship to the present day.

CIVIC DESIGN.

IN the Arts Theatre of Liverpool University, Professor S. D. Adshead on Friday last delivered his public inaugural lecture upon appointment as Associate-Professor of Town Planning and Civic Design to the University. The title of his lecture was "Civic Design," and it was illustrated with lantern slides. The lecture was open to the public without fee. A large attendance resulted.

Professor Adshead, in his opening remarks, said the present generation were too apt to associate existence with gaunt and ugly buildings, flaring advertisements, entanglements of electrified wires, collections of chimney-pots, crowded slums, jostling and noisy traffic, squalor and dirt. Instead of tacitly accepting all this a city should rather be considered as a chosen place wherein to dwell, as a rendezvous of daily entertainment, as a vast expression of the sympathies of the human race, as the greatest and noblest of works of art. The characteristics of a city expressed in its colour, its texture and its form reflect on the citizen himself. Its design, the grouping of its buildings and its outward expression are matters of vital importance to his well-being. That these should have been left in the past to blind chance to develop shows a lack of appreciation amongst those responsible for city building difficult to comprehend.

The establishment of a Chair of Civic Design in Liverpool marked a step in democratic organisation. If planned to a preconceived system, cities were the expression of a strong administration, whereas built up unit by unit they were the presentment of individual taste. The claim that in unfettered and unrestrained growth alone could be found the city of true expression was true only if the city were regarded as the expression merely of the individual, disregarding altogether the efforts of the citizen as a class. In a well-organised city the immediate requirements of the individual should be subordinate to the permanent requirements of the mass.

The first example of civic design in England was the formal planning by Inigo Jones of the Covent Garden Piazza and Lincoln's Inn Fields; it was followed by the efforts of Sir Christopher Wren. But London lost its chance through discarding the great scheme by Wren. In the eighteenth century a system of rectangular streets and spacious squares were spread out between Oxford Street and Marylebone, and we got Regent's Park, Portland Place, Regent Street, and much of the Strand. In Liverpool similar work resulted in Falkner and Abercromby Squares. The most orderly and the most comprehensive piece of town planning which Great Britain possessed was to be found in New Edinburgh. Towards the end of the eighteenth and the beginning of the nineteenth centuries, under the influence of the Classic revival, Bath, Ramsgate, Margate, Hastings and Hove each developed their towns. This work was carried out by aristocratic influence and controlled by the most scholarly and cultured architects of the period; but the passing of the Reform Bill and the extension of the franchise shifted the responsibility of city extension once more to the democracy and successful middle-class. They were practically uneducated, and extended their cities, erected their monuments, and laid out their streets without regard to association, æsthetic relation, or any other sort of cohesion. The Council of Edinburgh actually presented a Bill in Parliament to allow them to acquire and build over the open space on the south side of Princes Street—public grounds which were to-day the pride of Scotland. That Bill passed the Commons, but was rejected by the House of Lords.

With the present century a new era dawned for civic design. Democracy, after initial mistakes, began to grapple successfully with the problem. The fundamental requirements of a well-planned city depended on its sociological conditions. With proper distribution and communication the city simplified itself into residential districts, business districts and commercial zones, park systems and pleasure places. These were the essentials of communal existence over which, in the well-organised city, the municipality should have entire control. It was on the proper provision of these essentials that the physical health of a city entirely depended, and unless ample provision was made for their reception, moral force and intellect would undoubtedly suffer. Most of our larger cities, which have grown by leaps and bounds during the period of industrial prosperity that prevailed during the latter half of last century, require pulling down, Haussmannising, and re-erecting on intelligent lines. This was the work which the municipal authorities and the town planners of the future will be called upon to undertake.

THE ASSOCIATION OF ENGINEERS-IN-CHARGE.*

GENTLEMEN,—I fully appreciate the honour you have done me in selecting me as your President for the ensuing year, and shall do my best to maintain the high ideals which have been set before you by my predecessors in the chair. Although I am not new to the presidential chair of engineering societies, this Association is unique in its membership. Other societies contain engineers of all kinds: some who are good talkers—commercial engineers; some who are good schemers—who can get up a limited liability company to float their projects; some who are good designers—who can prepare plans for any work for which money is forthcoming; some who are specialists—who devote their time to carrying out one class of work; but you, gentlemen, are the engineers who have to maintain the work originated by others, who have to make it a practical success, who have to make good the shortcomings of the theoretical men, to remedy the defects of their designs, and to maintain everything in working order and in the highest state of efficiency. This is responsible work, but it is very interesting, and I have no doubt that you all feel a pardonable pride in the position you occupy.

I claim to have been an engineer-in-charge long before I joined your Association. From 1865 to 1877 I was assistant manager and afterwards manager of the outdoor department of Sir William Armstrong's firm, and was in charge of the erection of dock gates, bridges, hoists, cranes, hydraulic machinery of all kinds, and the fitting out of ironclads with guns. At the time of the construction of the Millwall Docks I was responsible for the daily work of fourteen foremen and 400 men, and these are my credentials for associating myself with you to-night.

In casting round for subjects upon which to address you,

* Inaugural address of the President, Mr. Henry Adams, M.Inst.C.E., M.I.Mech.E., F.S.I., F.R.San.I., &c., October 13.

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it seemed to me that "Standardisation" was the keynote of the present age, and that a few remarks upon it might be useful. The earliest standard was probably the unit of length, but down to 1824 the only legal measure of length was "three barleycorns round and dry make one inch, twelve inches one foot, and three feet one yard." The first standard worthy of the name was a yard length marked on a brass rod by a mechanician named Graham, employed by the Royal Society in 1742. Two copies of Graham's yard, made by Bird in 1790, were legalised by Act of Parliament in 1824. Ten years after this the standards were destroyed by a fire which burnt down the Houses of Parliament; but the Royal Astronomical Society had an accurate copy, and at least one other was also in existence. From these, four Parliamentary copies were made and deposited respectively in the Royal Mint, with the Royal Society, in the Royal Observatory at Greenwich, and the Houses of Parliament. In form they are all bronze bars 1 inch square, each being 38 inches long. Near the ends of each bar there are two holes, in which are inserted gold plugs with fine lines engraved upon their surfaces, which lines are exactly one yard apart at a certain stated temperature. The Act legalising these standards was passed in 1855. The accuracy of the measurement adopted may be inferred from the fact that a change of temperature of only one-hundredth of a degree Fahrenheit was found to produce a sensible effect in the length, and this yard is now the British standard of length.

Approximate standard measures for public use will be found on the north terrace inside the balustrade of Trafalgar Square, where the Westminster engineers check their surveying chains before and after use; and also in the Guildhall of the City of London, which surveyors in the City find more convenient. A 100-foot steel tape may generally be found to be within $\frac{1}{8}$ inch of accuracy, a steel chain from $\frac{1}{2}$ inch to $1\frac{1}{2}$ inches, according to age and condition; while a corrected 66-feet Chesterman wired tape, after being used on wet grass and wound up again, was found two days' later to be 65 feet 4 inches long; and three weeks later, when tested again before use, was found to be 65 feet 9 inches long, or still contracted 3 inches owing to getting wet.

The method of estimating length by lines engraved across a bar is known as "line measure," and comparison in the case of the standard bars was effected by means of two micrometer microscopes reading to one twenty-thousandth part of an inch. Sir Joseph Whitworth, however, showed that the principle of "end measurement" was more accurate, and that the sense of touch, aided by mechanical means, was so much more reliable than that of sight, that he was able to detect by his measuring machine a difference of length of one-millionth of an inch. This remarkable feat was rendered possible by the means then available for producing true planes, which enabled apparatus to be constructed with almost absolute precision.

In 1840 Sir Joseph Whitworth introduced the method of scraping surface plates, instead of grinding them, to produce a true plane. He showed that to originate a surface plate it was necessary to obtain exact agreement between any two in a set of three, two only not being sufficient, as they might be respectively concave and convex, and be parts of a true sphere.

I have not found any record of the first introduction of plate and wire gauges, but fifty years ago there were in existence the Birmingham wire gauge, the Birmingham plate gauge, the Lancashire gauge, the music-wire gauge, the needle-wire gauge, and the Whitworth decimal gauge. The latter is the only one upon a rational basis, and as each number represents so many mils, or thousandths of an inch, it could have been made of universal application. The Birmingham wire gauge (B.W.G.) was the best known; but this gave way on March 1, 1884, to the Imperial standard wire gauge (S.W.G.). This and the standard sheet and hoop iron gauge, which came into use at the same date, are merely fixed sizes corresponding to certain dimensions, but proceeding by irregular intervals. For galvanised iron roofing the old B.W.G. is still largely in use, but for sheet zinc there is a special gauge which bears no relation to anything else. For sheet lead the weight in lbs. per foot super gives the designation, e.g., 5 lb. lead, which is simple and satisfactory.

The first notable and practically successful effort at standardisation, as we now understand it, occurred when Sir Joseph Whitworth introduced his standard screw threads for bolts and nuts (1841-57). When I was an apprentice it was a very common thing to find that the bolts and nuts by different makers were not interchangeable, and a broken stud in a cylinder-end meant not only drilling out, but tapping a larger hole, because there were no dies to make the same thread as before. Only a few of the best shops were at that time supplied with Whitworth stocks and dies and screw taps; now, as you all know, they are universal—in Great Britain, at least. The Whitworth standard is, however, not the only one we have in use at the present time for screw threads. That was for mechanical engineers, and may be called the "bolt" standard. In addition we have the Whitworth gas threads adopted by the tube trade generally, and the British Association gauge for apparatus screws, which is adopted by the Post Office Telegraph Department and most large electrical firms.

Mr. H. F. Donaldson, in a recent lecture to the graduates of the Institution of Mechanical Engineers on "Interchangeability and Methods of Securing it in Screw-Threads," said:—"It is impossible to overstate the value, not only to this country but to the world at large, of the work of Sir Joseph Whitworth. By his means standard length pieces, and machines of great precision for measuring and comparing them, were brought into practical use, and within the reach of anyone desiring to improve the quality of his work. He not only put these, but he put also upon the market plug-and-ring gauges nominally of true dimension, and, I believe, he also actually produced the equivalent of limit gauges, though he did not press this method of working upon the public view, perhaps because the general methods of engineering at that time were not sufficiently advanced, and did not seem to require it." In case there should be any present who are not acquainted with the object and use of limit-gauges, I may explain that the system consists of having, for every true dimension required, two gauges called "go" and "not-go" gauges, so made that one is larger by a defined amount than the desired dimension of the piece of work, and the other smaller also by a defined amount. There are two important terms used in connection with these gauges—"allowance" and "tolerance." "Allowance" is the intended difference in measurement between the diameter of a shaft and its bearing, or a bolt and its hole; and "tolerance" is the difference that may be tolerated in good work between the dimension desired and that achieved.

The economical advantages of standardisation must have occurred to every manufacturing firm very early in its career, although it may not have got beyond the elementary stage where the parts could be cast from the same pattern, and marked off from the same templates. The firm of Willans & Robinson may occur to you as one that carried this principle to its extreme limit of usefulness, where every part of an engine was gauged to the thousandth of an inch to be perfectly interchangeable at any time; and many of you probably know that our friend, Capt. Riall Sankey, was largely responsible for this happy state of things. While I was working as an improver in a piecework gang I was very fond of introducing marking-off gauges, self-adjusting lathe carriers, and other standardising and labour-saving appliances, leaving me with spare time which, I am afraid, was spent in "larking about"; at any rate, it led to my being reported by the ganger, who said he and the other members of the gang were "keeping me." This led to an investigation, when it was found that I had earned more than any others in the gang, and then they turned face and said I was "bringing down the prices." It did not, however, prevent me from endeavouring always to find the shortest road to efficient completion.

One of the most hotly discussed questions of standardisation was known as "the battle of the gauges." It referred to the gauge of the rails for railway traffic, and ended in the permanent adoption by Act of Parliament (1846) of the standard of 4 feet $8\frac{1}{2}$ inches between the rails for Great Britain, and 5 feet 3 inches for Ireland. The 4 feet $8\frac{1}{2}$ inches was called "narrow gauge," to distinguish it from the "broad gauge" of 7 feet adopted on the Great Western Railway, but discarded in May, 1892. A similar battle was fought over a gauge for the railways in India, where we have the broad gauge of 5 feet 6 inches and the narrow gauge 1 m. = 3 feet $3\frac{3}{8}$ inches, and now the battle ground has shifted to Australia, where there are about 7,000 miles of $3\frac{1}{2}$ feet gauge, somewhat less of 5 feet 3 inches gauge scattered over several divisions, and 3,472 miles of 4 feet $8\frac{1}{2}$ inches gauge in New South Wales. Besides this, there are eighty-two miles of $2\frac{1}{2}$ feet gauge, and twenty-three miles of 2 feet. Standardisation has been proposed, but no action has yet been taken. It has been generally stated that the 4 feet $8\frac{1}{2}$ inches gauge was originally adopted because it agreed with certain existing colliery tram lines; but my idea is that no one would fix upon such an irregular measurement, and that it is more likely derived from a 5 feet over-all measurement of the rails.

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The formation of the Engineering Standards Committee by the Institution of Civil Engineers, at the suggestion of Sir John Wolfe Barry in 1901, was the first combined effort at standardisation, and the success of that body has been very marked. The main committee was reinforced by representatives of the Institution of Mechanical Engineers, the Iron and Steel Institute, the Institution of Naval Architects, and the Institution of Electrical Engineers; but besides the main committee, twelve sectional committees and twenty-four sub-committees have up to the present been formed to carry on the work. Some 280 engineers and others representing the cream of the experts in each branch have given their services freely to the work. They turned their attention first to rolled joists, and produced a very good list; up to that time the sizes and proportions of the various sections depended upon individual judgment, and there was no sort of agreement between the various makers. Besides rolled joists, all the common forms of section, angles, tees, zeds, channels, &c., were included, and later on, tables of their properties were given, viz., areas, weights, moments of inertia, section moduli, radii of gyration, &c. All this very much simplifies the work of designing, and has proved a great advantage to manufacturers. Those of you who may be acquainted with Skelton & Co.'s broad-flanged beams may have wondered at their exclusion from the standard list, seeing that their undoubted economy for many purposes is beyond all question. The reason given is that they can only be manufactured in a "Grey" mill under licence from the patentee, and that they are, therefore, at present not suitable subjects to include under a public standard, but there is nothing to prevent them from being adopted in suitable cases.

The British Standard Specification for Portland cement, which is No. 12 of the Reports, has been of very-far-reaching importance, and has done more than anything else to raise the quality of Portland cement. Formerly every architect and engineer had his own ideas, or borrowed some, with regard to the tests and other details mentioned in his specification, frequently providing the manufacturers with difficulties, but, perhaps, quite as often giving them a loophole for escape. If the standard specification had not appeared just when it did, the spread of reinforced concrete building construction would have been attended with much greater risk, and probably failures also.

The standard specification for structural steel for ship-building, boilers, and bridges, and the forms of standard tensile test pieces, have all been extremely useful. Then we have the specifications for tramway rails and fishplates, bull-headed and flat-bottomed railway rails, tubular tramway poles, pipe flanges and pipe threads, and various electrical matters. Stoneware pipes are not, perhaps, of such importance as many subjects that have already received attention; but there is a general consensus of opinion that they should be standardised, and it is probable that they will shortly receive the attention of the Engineering Standards Committee.

The *Engineering Record* points out that the standardisation of sections of iron and steel or the quality of cement is by no means all that has been desired in Great Britain, for there has been a certain degree of pressure brought to bear to standardise machinery. Early in the committee's work it was recognised that when the movement was extended to the form of structures or machines, there was risk of encroaching upon the domain of original thought and design. It was at first decided that only materials and sections should be dealt with, leaving to the engineer the decision as to how the standards should best be applied to solve the problems which he might have under consideration. In a rather strange way, however, a departure from this general decision was made quite soon. The Secretary of State for India requested the committee to prepare standard types for locomotives for the Indian railways. The consulting engineers of the Indian Government and the chief locomotive builders were accordingly associated with the proper sub-committees, and eventually a number of standard types of engines were designed, which have proved very satisfactory. This instance of the standardisation of complete machines, while not absolutely unique in the work of the committee, is nevertheless still looked upon as open to question as a regular policy, and no action has yet been taken on the request to standardise dynamos and prime movers. The danger of adherence to a standard after it is no longer serviceable has been recognised from the outset of the work of the British committee, like that of the American Society for Testing Materials, and consequently provisions are made for the reconsideration of every standard section or specification when the time is ripe for such action. Care has been taken, however, to safeguard this work of revision; for standards which are revised every year or so are hardly standards at all. It is believed that by having each of them prepared by a sub-committee composed of men representing engineers, purchasers, and manufacturers, all engaged in their daily work with the subjects in which they are dealing, the standards will be so well drawn originally that the necessity for their revision will not arise quickly.

(To be concluded.)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* illustrates three houses of various sizes from the Garden City on Long Island, New York, all of which are examples of the bungalow type of summer residence with the upper storeys in the roofs. Verandahs are naturally a great feature of the designs, whilst the interior finishings, though simple, are anything but lacking in style. An interesting and suggestive article is given on the lighting of churches.

La Construction Moderne gives us a description, with plans, details and views of a box built for Mr. W. K. Vanderbilt in connection with his racing stables at Saint Louis-de-Poissy from the designs of M. Henri Guillaume, who has adopted for his *motif* the French country house architecture of the period of Louis XIII. Our contemporary has an amusing short article on the use of lifts by the Romans on the authority of Commendatore Boni. On the subject of Old Paris there are notes of the Roman baths and the Hôtel de Cluny.

Deutsche Bauzeitung continues Professor Ehemann's story of Frankish architecture, dealing now with the period 1245-90, which the Professor styles the Free-Gothic; that from 1290 to 1400 the "flowering-time" or fruition of Gothic; and the later Gothic 1400-1530. There are some excellent illustrations, but these are mainly of the "barock" period of German Renaissance, notably the Schloss Weissenstein, near Pommersfelden, and some further examples from Würzburg.

Architekten und Baumeister Zeitung illustrates a competition design for the extension of the War Office building at Vienna by Hugo Jos. Teffer.

A Construcçao Moderna illustrates modern houses at Lisbon and Coimbra, besides some details of joinery of the maddest "new-art" type.

Het Huis devotes itself to two subjects in the current issue, the decorative furnishing of the interior of passenger ships and child-life amongst the ancient Greeks. The former is treated with simplicity and refinement without the expensive ostentation that is to be found in English and German trans-Atlantic liners. The latter subject is worked out from illustrations on Greek vases and monuments, with one or two examples from Roman work.

The *Architectural Record* commences a series of articles on "The Architecture of American Colleges" with an illustrated description of Harvard University, whose succession of buildings is a historical record of the progress of American architecture in college design. "The Work of Lewis P. Hobart" is an appreciation, fully illustrated, of one of the most prominent of the architects of San Francisco, whose work is remarkable for its quality.

The *Architectural Review* (Boston, U.S.A.) illustrates a charming little town house, the residence of Bertram G. Goodhue, a member of the firm of architects, Cram, Goodhue & Ferguson; also with great completeness of detail a town mansion, No. 844 Fifth Avenue, New York City, of which Mr. Charles A. Platt is the architect.

The *Engineering Record* gives an account of a particularly remarkable example of the typically American constructional feat of moving an entire building, in this instance the public library of Brookline, Massachusetts, which was shifted bodily to a new site without interference with its use by the public. A description is given of the new type of concrete pile in use on the Continent of Europe formed by the method known as the "Compressol" system. This has been largely employed in Paris, and is now being utilised for the foundations of the new wing of the Palais de Justice on the bank of the Seine.

At a Meeting of representative citizens and Guild Brethren held in Edinburgh last week, it was unanimously resolved to nominate Mr. J. Macintyre Henry, architect, 7 South Charlotte Street, Edinburgh, for the office of Lord Dean of Guild. Mr. Henry has been a member of the Dean of Guild Court continuously since November 1904 and of the Guildry since 1890.

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FIRST PREMIATED DESIGN.—LAYING OUT LANDS AT THORNLIEBANK, GLASGOW, FOR THE HUTCHESONS' TRUST.
Messrs. J. Boyd & Co., Architects.

COMPETITIONS.

IT will be remembered that the assessor's award of the third premium in the Grimsby Town Hall competition was not accepted by the finance committee on the ground that the architects' estimate was considerably above the limit stipulated, and the assessor, Sir W. Alfred Gelder, F.R.I.B.A., was asked for an explanation. This came before the finance committee last week, and being considered satisfactory, the third premium of 100*l.* goes to Messrs. Rigby, Oliver & Phipps, of 92 Market Street, Manchester, for design No. 47.

The Hamilton Burgh School, N.B., have adopted the plans submitted in competition by Messrs. Alex. Cullen, Lochhead & Brown, architects, Hamilton, for the erection of a new academy at an estimated cost of 35,000*l.* The second place has been awarded to Messrs. H. & D. Barclay, 245 St. Vincent Street, Glasgow; the third to Messrs. Salmon, Son & Gillespie, 53 Bothwell Street, Glasgow; and the fourth to Mr. Gavin Paterson, Hamilton. The competition was limited to architects practising in Lanarkshire, and Mr. G. Bell, F.R.I.B.A., Glasgow, acted as assessor.

The awards in the Hutchesons' hospital feuing design competition were made at a general meeting of the patrons held on the 6th inst., at Glasgow, and the following are the names and addresses of the authors of the designs adjudicated first, second, third and fourth in order of merit, viz.:—First, Messrs. Josh. Boyd & Co., architects, 49 Bath Street, Glasgow (100*l.*); second, Mr. Daniel McInnes, C.E., 3 Kennyhill Square, Dennistoun, Glasgow (75*l.*); third, Mr. J. Gilchrist Bennett, C.E., 12 High Street, Paisley (50*l.*); and fourth, Messrs. W. R. Copland & Sons, C.E., 146 West Regent Street, Glasgow (25*l.*).

The successful design is shown above.

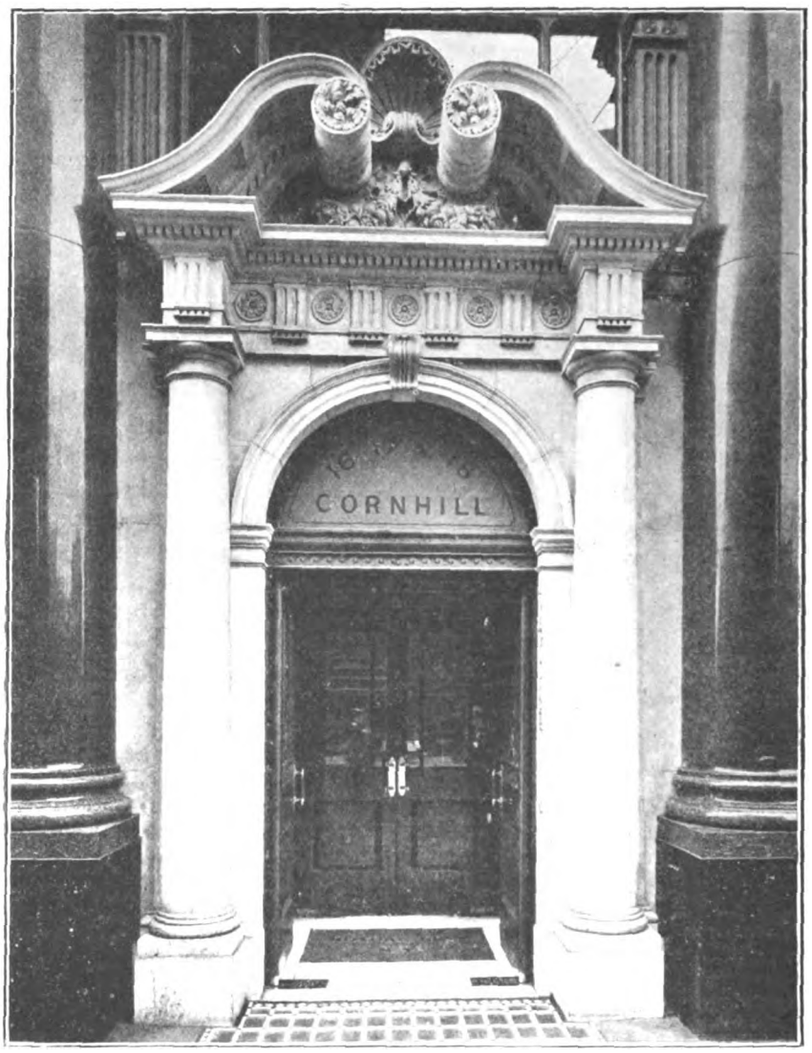
Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Herculaneum.

Sir,—A short time ago there was some talk of the Italian Government seriously undertaking the excavation of Herculaneum, the richest mine of art treasures in Europe. However, it is to be sincerely hoped that this scheme will be persevered in, and not be shelved as so many important schemes have been ("vita nostra brevis est, et Ars longa est"). This fine city has been buried for centuries under a stream of liquid lava. The sudden disaster prevented the removal of these art treasures, which have been preserved for hundreds of years, being cast out by a warm stream of lava, and must be in the same state as it was when the terrible disaster overwhelmed the city. Pompeii, its neighbour, was destroyed by a continued shower of ashes, but the inhabitants had time

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DOORWAY, MUTUAL LIFE ASSURANCE COMPANY OF NEW YORK, CORNHILL.

to save most of their valued possessions before the city was buried. I believe one of the villas on the outskirts of Herculaneum has been excavated, when valuable manuscripts and art treasures were found in a perfect state of preservation. As most of us are aware, the Greeks introduced coloured architecture into Italy, and examples of their best work are buried in Herculaneum. When we come to consider the finely preserved work laid bare in Pompeii, how much better preserved must be the work cast out in lava in Herculaneum? The grand work Gell's "Pompeii," published some years ago, is a most valuable work of reference for every decorative architect, showing what a state of perfection decorative art had arrived at. After all said and done, we of the present day cannot improve upon it. Every true art lover must sincerely wish that the above scheme may be realised, and thus give to the world the treasures buried for so many centuries.—Yours obediently,

Henry H. B. Sang,
Architecte-Decorateur.

Texture.

Sir,—We notice in your issue of the 8th inst., in your leading article under the heading "Texture," a reference to Pentelikon marble, from which it would appear that some few doubts as to the durability of this material still linger in the mind of the writer.

In so influential a journal as *The Architect*, we do not think such a suggestion should be allowed to pass unnoticed, and therefore send you herewith a photograph of the doorway of the Mutual Life Assurance Company of New York, 16, 17 and 18 Cornhill. This was erected from the specification of J. Macvicar Anderson, Esq., F.R.I.B.A., now over ten years ago, in Pentelikon marble, and has been quite exposed to the ravages of the London atmosphere.

A glance at the carved details will satisfy the most critical that no sign of decay whatever is apparent, and a careful examination of the original will thoroughly confirm our statement that this beautiful material is thoroughly durable.

Another instance of the unsuitability for exterior use of white marble in London has been cited in the caps of the granite columns at the Sun Life Office, corner of Vere Street, Oxford Street. These have been fixed even longer than the porch above referred to, and have, we believe, never been touched. London dirt lies thick upon them, but the material itself is as sound and the arrises as sharp as the day on which they were erected.

We do not and never have claimed that Pentelikon marble will remain white, without attention, in London. One of its greatest merits is that it can be washed, and we therefore assert that if architects can persuade their clients to allot a small sum yearly for cleaning, then in Pentelikon marble they have a material that will maintain its own, and add to the beauty of London as no other building medium is capable of doing.—Yours faithfully,

Marmor, Ltd.

18 Finsbury Square, London, E.C.: October 12, 1909.

GENERAL.

The Directors of the London and Lancashire Fire Insurance Company have declared an interim dividend of 6s. per share (being at the same rate as the last interim dividend), payable on November 1, 1909.

The Glasgow Corporation will next week consider the following motion:—"That, in order that the purchase or acceptance of pictures and art objects for the Corporation collections may be put on a more satisfactory footing, it be resolved that a number of gentlemen of recognised taste and experience be invited to form an advisory committee to co-operate with the galleries sub-committee in the matter."

The Preliminary Work for the re-erection of Crosby Hall at Chelsea is now in progress. The houses in Danvers Street have been demolished, and the contractors have already excavated 20 feet of the foundations for the new hall. The actual putting up the building is expected to commence shortly, and the new stonework to take the place of the rubble walls is being prepared.

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The Architect.

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FORTHCOMING EVENTS.

Friday, October 22.

Architectural Association: Paper on the "Architectural Association's Excursion to Cheltenham and District, 1909," by Mr. F. Dare Clapham, F.R.I.B.A.

Saturday, October 23.

Junior Institution of Engineers: Conversazione at Caxton Hall, Westminster.

Monday, November 1.

Royal Institute of British Architects: President's Opening Address. Presentation of the Royal Gold Medal to Dr. Arthur Evans, F.R.S. Address by Dr. Evans on "Recent Discoveries in Crete."

Liverpool Architectural Society: Paper on "The Elements of Design in Internal Decoration," by Mr. T. R. Spence.

Thursday, November 4.

Paint and Varnish Society: Paper on "Painting on Stucco," by Mr. Furniss.

SCHOOLS FOR ARCHITECTS.—III.

LIVERPOOL UNIVERSITY.

THE School of Architecture at the University of Liverpool is remarkable for the recognition of architecture as worthy of a degree on its own merits, and not as an offshoot or honours subject in a presumably superior department of knowledge. The young architect who obtains his early training at Liverpool University can obtain the degree of Bachelor of Architecture, not merely a degree of B.A.(Arch.).

To obtain the degree of Bachelor of Architecture five years' study and three examinations have to be passed. The first step, of course, as in all universities, is matriculation, by the passing either of the Matriculation examination of this University or of other approved and equivalent examination.

Having matriculated, the student starts work for the Intermediate examination, the subjects of which are (1) History of Architecture; (2) either Ancient History or Modern History; (3) either Pure Mathematics, Applied Mathematics, Physics, or Chemistry; (4) two subjects, one at least being a modern language, selected from Greek, Latin, French, German, Italian, Spanish, English Literature, Logic, Pure or Applied Mathematics, Physics or Chemistry (not, of course, duplicating the subject taken in section (3)). Thus the first year in the University course aims at extending the range of the student's general knowledge acquired at matriculation, with special reference to the study of architecture. During the time the first-year student is not attending lectures on these subjects of the Intermediate examination he is expected to attend the architectural studio.

During his second and third years the degree student devotes his attention to more particularly architectural work and prepares for an examination in (1) History of Architecture, with special study of an approved period; (2) Architectural Design; (3) Building Construction; (4) Mechanics of Structures; (5) a subject in the Fine Arts other than Architecture. Designs made during the course of study and measured drawings of a building approved by the Professor of Architecture have to be presented and are taken into account by the examiners.

An excellent point in the scheme for the Liverpool University degree of Bachelor of Architecture is that after the second examination has been passed the student is required to spend two years in the office of a practising architect, or in such other form of practical work as may be recognised, as well as to attend during that time courses of instruction and to prepare certain designs and measured drawings. After this two years' course of practical experience comes the Final examination and the attainment of graduate rank.

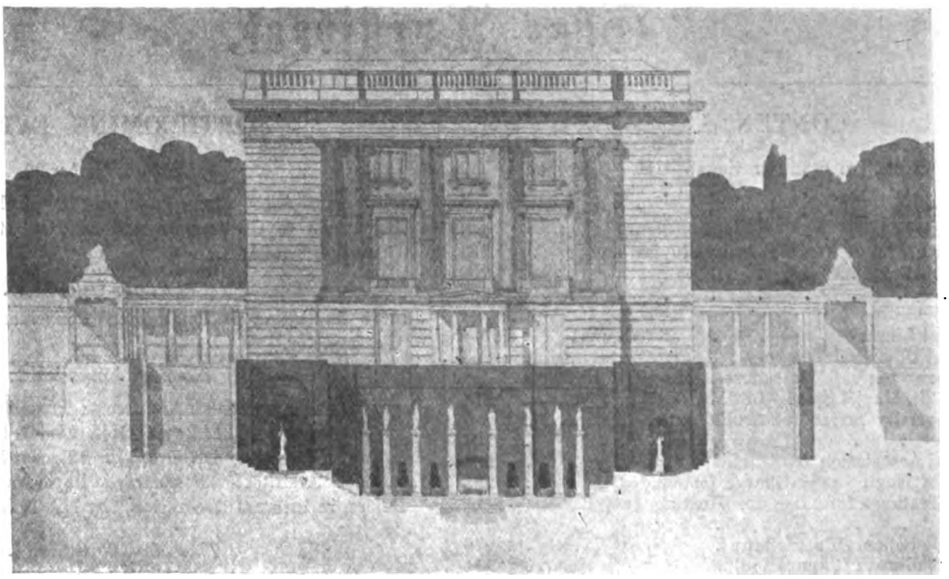
As with other institutions, Liverpool University recognises that not all architectural students aspire to the honour of a degree, and it therefore offers as an alternative a diploma course, which chiefly differs from the degree course in the omission of matriculation and of the Intermediate examination—that is, of the subjects of more general education—whilst it retains the curriculum of the second, third, fourth and fifth years of the degree student, including the practical work in an architect's office.

Such is the general scheme of architectural education propounded at Liverpool University for the proper and systematic training of a young architect. We now come to a consideration of the methods by which this training is effected.

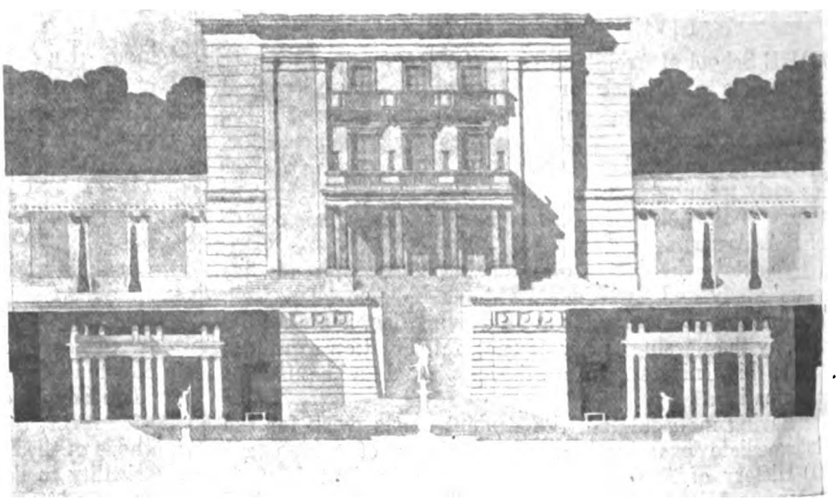
The School of Architecture at Liverpool University is the foremost, if not the only, exponent in England of the methods of the Ecole des Beaux-Arts at Paris. Academic classicality in design, the study of the grand manner, is commenced with the tyro's first attack on the "orders." These are drawn not, as is usually the case, as isolated and imperfectly understood examples of columns and entablatures, but as component parts of an architectural design, which itself is regarded as an incident in a composition with its natural surroundings. Thus a large view of architecture is impressed upon the young architect at an early stage of his career, and he comes to regard his art with enthusiasm as something with possibilities and worthy of his best efforts and most earnest devotion. This is surely an excellent groundwork for an architect's training.

In the teaching of design, following the French manner, subjects of an academic, if somewhat unpractical and impossible, character are set for second and third year students; but with the view of preventing the young architect from becoming a mere visionary these idealist exercises are alternated with subjects of a more practical and everyday character in which the construction on modern methods is an integral part of the work. It is interesting to notice that in these designs classical feeling is expressed and classical detail employed, so that we may regard the Liverpool School of Architecture as being essentially classical in its tendency. The Parisian methods of architectural study are so far followed as to embrace their particular form of draughtsmanship with its careful projection of shadows, as may be seen in the blocks we include with our text, and in an example of the work of one of the students, Mr. H. A. Dod, which we include amongst our illustrations in this issue. The examination designs, of which this is an instance, are by the way produced, as in the Ecole des Beaux-Arts, *en loge*, each student working in a separate room.

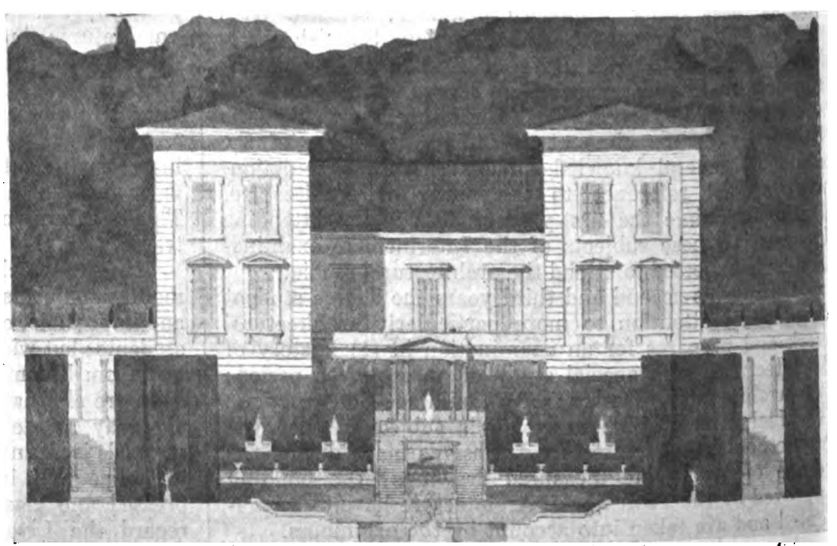
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DESIGNS FOR A VILLA



FOR A MAN



OF CLASSICAL TASTE.

Although, as is right, design occupies the first place in the training of an architectural student at Liverpool University, it must not be supposed that other necessary branches are forgotten. History, materials and construction, modelling, drawing, perspective and sciography, graphic statics, all form part of the work of the school, in addition to those subjects taken in common with students of the faculties of arts, science, and engineering.

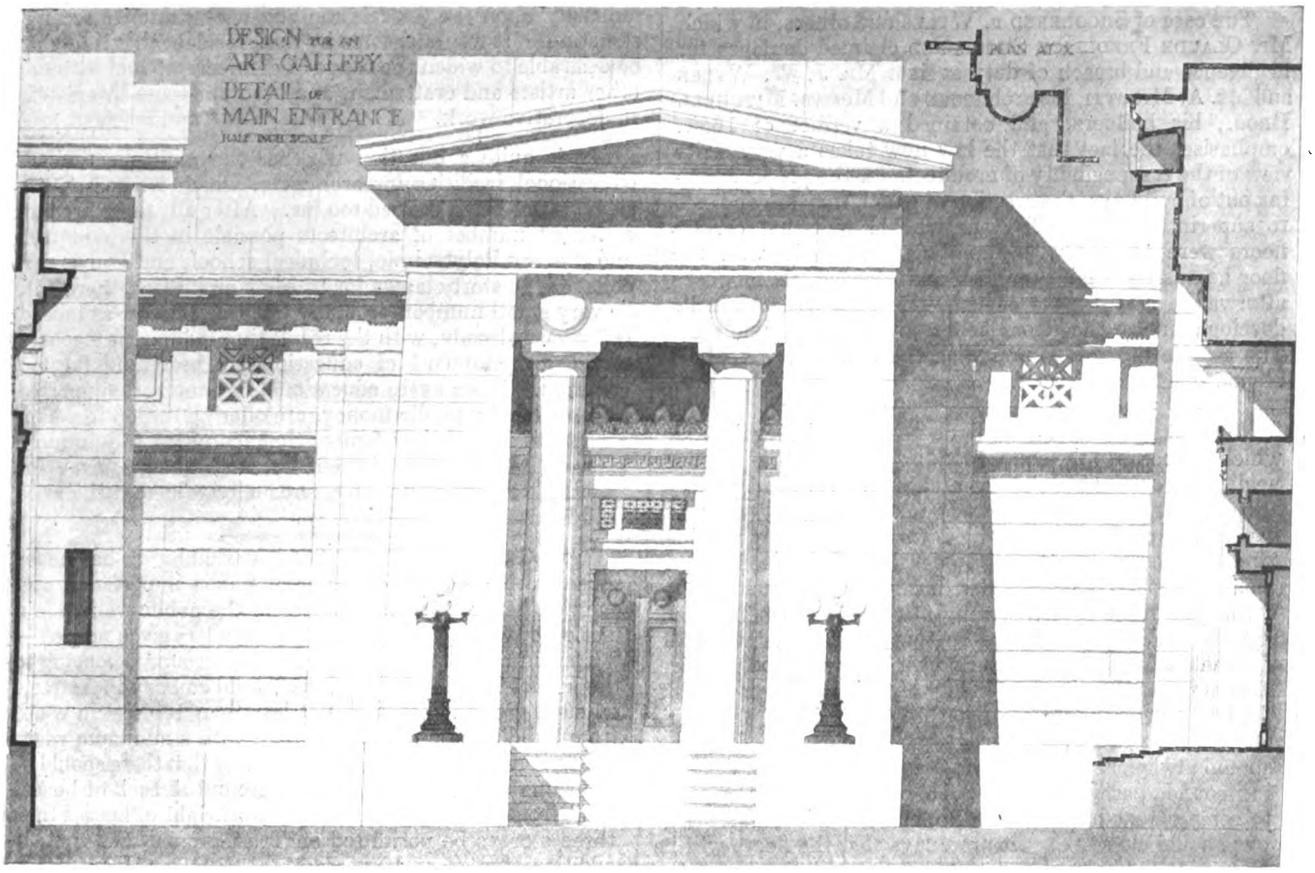
The fee for the complete course is 30*l.* per annum whilst working entirely in the school, and 2*l.* per annum for the period that a student is working in an architect's office. The fees are also arranged sectionally, so that any student who does not desire the complete course can attend part only. This particularly applies to those who wish to join evening classes, but is applicable also to the day instruction.

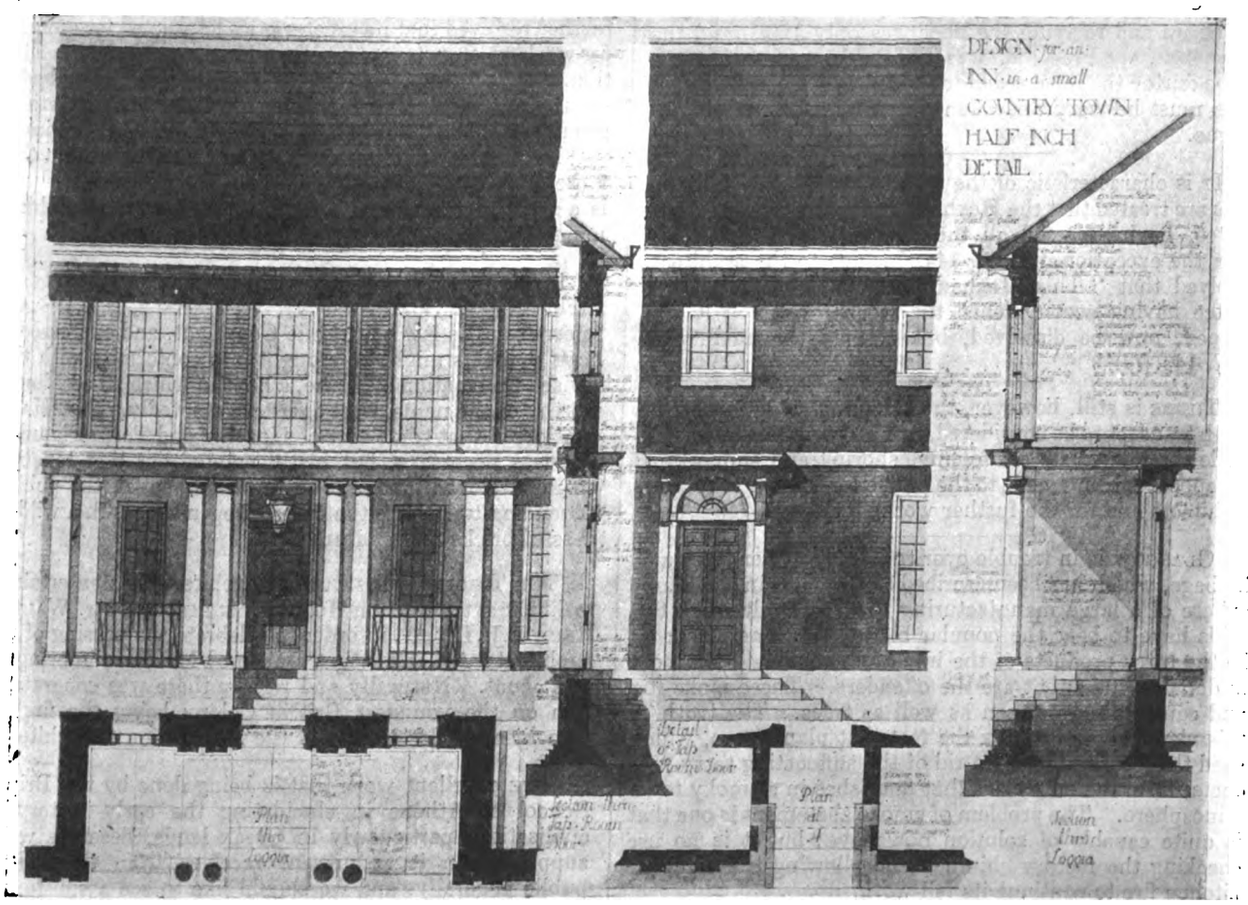
The advantages of University life accrue to the architectural student at Liverpool. He comes in contact with students for other professions and callings in athletics and other spheres of social life. Thus not only is his mind broadened and his outlook of life enlarged, but he makes friendships that are of value in after life. He gains, in fact, many of the advantages of Oxford or Cambridge whilst pursuing studies more immediately connected with his future profession than are possible at the older seats of learning. Scholarships and prizes are open to students of the school, and it is satisfactory to note that in the annual competitions of the Royal Institute, students of the Liverpool School of Architecture have already made their mark.

A new development in education is this month started at Liverpool University as a branch of the School of Architecture in the department of Civic Design, of which Mr. S. D. Adshead, F.R.I.B.A., has been appointed Professor. This will provide a training for the class of professional advisers and designers undoubtedly necessary when the present Town-Planning Bill becomes law and in the present recognition of town planning as a subject of importance to the welfare of the community.

That civic design embraces far more than a haphazard laying out of building estates, with the one aim of providing the maximum of frontage for ground rents on any given piece of land, is evident from the curriculum deemed necessary at Liverpool University, and

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from the staff engaged for the purpose of carrying out that curriculum.

Landscape design will be taught by Mr. T. H. Mawson, civic engineering by Professors J. A. Brodie and S. W. Perrott, civic hygiene by Professor Dr. E. W. Hope, civic law by Mr. H. Chaloner Dowdall.

The high-minded tone in which architecture is regarded at Liverpool University gives promise that the highest aspect of all architecture, civic design, will be adequately treated in the Liverpool School of Architecture.

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NOTES AND COMMENTS.

The case of Shoolbred *v.* Wyles and others, in which Mr. Claude Frederick Shoolbred claimed damages for negligence and breach of duty against Mr. J. W. Wyles and Mr. A. Migotti, his architects, and Messrs. Mitchell Bros., his builders, and obtained a verdict of 165*l.*, emphasises the fact that the law now takes a very strict view of the responsibility of architects for the proper carrying out of buildings, the erection of which they are engaged to superintend. Briefly, the trouble was that certain floors were pugged with lime-pugging put in wet, the floor boards were laid, tongued and grooved, three weeks afterwards, and dry rot ensued, no doubt assisted in its development by the floors being covered with linoleum. The architects, in common with the builders, were held responsible for the dry rot.

Dry rot seems to be a regular bête noir to the legal mind, which has come to the conclusion that it necessarily implies negligence on the part of the architect. As nearly every scrap of fir timber that comes to this country may be expected to carry germs of the dry rot fungus only waiting for a favourable opportunity to develope, it is clear that if architects are to escape being mulcted they must see to it that the most thorough precautions are taken to avoid trouble. It is too much the custom to omit air-bricks for the ventilation of upper floors, but it is a very good practice always to put them in, and plenty of them. Never mind if the builder and his foreman do think one a bit of a faddist. Of course it was a mistake to use the pugging wet. Pugging should always be laid dry. It is more effective in deadening sound, permits a certain amount of ventilation, and to some extent hinders the development of dry rot. But one should always expect nowadays that the floors will be covered with linoleum and provide for ventilation below the floor boards and not through them. In this particular case the damages seem to us to be vindictive, as the cost of taking up and relaying the floor was only 120*l.*, and the other 45*l.*, we presume, was for the loss of use of the house during the repairs and for moral damage. So architects must be wary and shun dry rot as they would the plague.

It is characteristic of the way in which church architects are treated that the Hexham Abbey Completion Committee, having passed all the accounts, and paid them with the exception of 580*l.* 14*s.* 7*d.* due to the architect, resolved that "This Hexham Abbey Completion Committee having accomplished the work for which it was formed, now be dissolved, but accepts the liability of 580*l.* 14*s.* 7*d.*"

There is still, however, the alarming condition of the north transept to be considered, and preparations have been made for immediate scaffolding, shoring and supporting. An appeal is being made to the public for 3,200*l.* to pay the architects and for the further works required.

Glasgow is in trouble over the decay of her trees and herbage, which has been ascribed to the acids in the atmosphere of a large manufacturing town; but although the acids have to bear the popular blame, it seems rather to be the tarry products of the imperfect combustion of coal in domestic fires that are the offenders. These make fog and cause injury to men as well as trees. The truth of this view is borne out by the fact that plane trees, which shed their bark and so get rid of the suffocating tarry products, form the only class that flourishes in a smoky town atmosphere. The problem of smoke abatement is one that is quite capable of solution nowadays; but it is no use checking the factory chimney and allowing the domestic kitchen fire to continue its fell work.

At the annual general meeting of the Architectural Association of Ireland, held last week, the President, Mr. George Beckett, M.R.I.A.I., in his inaugural address alluded to some discouraging conditions affecting the Society. Not only is there a slightly diminished membership, but the foundation of a Chair of Architecture by the Senate of the University will, it is feared, operate prejudicially upon the Association and necessitate its reconstruction. It was suggested by the President that it might be desirable to widen the range of membership and include other artists and craftsmen, and even amateurs interested in decorative work.

It is quite a question whether the multiplication of educational facilities for architects, which we see on all sides, is not being carried too far. After all, there are but a limited number of architects possible in this country, and if every Polytechnic, technical school, and University college is to start classes for training architects, there will be very small numbers in many of those classes, as indeed is the case already, with the result that indifferent teachers and a low standard of education are becoming far too common. Then again educational institutions, supported more or less by public money, are offering tuition to young architects at such low figures that many try to join more classes than they can benefit by, and what is given for nothing, or next to nothing, is usually valued at the price paid for it.

The George Heriot's Trust in Edinburgh has under consideration a question of great public importance, and one that betokens a high regard for the public welfare in a motion of which Councillor Leishman has given notice:—"That in all future feus and sales of ground belonging to the Heriot Trust the conditions should embody that streets on such ground should be not less than 100 feet in width from building line to building line, with a minimum width of carriage and footway of 80 feet, and that there should be the same amount of unbuilt-on ground at back of houses as at front; further, that no greater height of houses than three storeys be permitted on Trust ground, and that, in addition, for every 10 acres feued there should be left in each particular district at least one acre for public ground to be used as a recreation ground for public use. It is further resolved that no greater price be exacted for ground for working-class tenements than for villas. It is, in addition, resolved that conditions of feu or sale should embody restrictions against subdividing houses and creating ground annuals." It is hardly likely that such a proposal will be accepted without much discussion, if at all; but the mere acceptance of the notice of motion shows that there is a feeling abroad that town planning means something more than mere money making.

In his presidential address to the Sheffield Society of Architects and Surveyors, Mr. W. J. Hale, F.R.I.B.A., referred to the law of Artistic Copyright, and expressed a hope that this might be brought into conformity with the revised Convention of Berne, a hope in which all architects worthy of the name must share unreservedly. Mr. Hale considered that some sort of Housing and Town Planning Act was necessary, but justly pointed out that taxation on undeveloped land was to the detriment of the public, as tending to remove the oases of open spaces in a wilderness of bricks and mortar.

The Transvaal Institute of Architects has entertained to dinner at the Carlton Hotel, Johannesburg, Mr. Walter Reid, F.R.I.B.A., in order to celebrate the passing of the Architects' Act and the part taken by Mr. Reid in bringing this about. Naturally and rightly there was congratulation on the youngest British Colony being the first to recognise the desirability of the registration of architects.

The excellent work that is being done by the British School at Athens in elucidating the early history of civilisation, particularly in Greek lands, deserves wider support than it at present receives from the British public generally, and we should like to see a substantial diminution of the excess of expenditure over receipts, amounting for the past year to 289*l.* 7*s.* 1*d.* In exploration work particularly it is impossible to always cut one's coat according to the cloth. Early expenditure in excavation may be entirely wasted by shutting down for the want of the last 100*l.* just as the investigators are reaching the fruition of their labours.

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Curious finds often come before architects in dealing with old buildings, and in carrying out repairs at Tichborne Church, Hants., Mr. N. C. H. Nisbett, A.R.I.B.A., came across a copper disc about the size of a crown piece, with upon it a pointed shield enamelled with an heraldic device, *Or* or *gules* (the colour seems not quite certain), a lion rampant proper (?). Mr. Reginald Smith, of the British Museum, considers the disc to be the decoration of a coffin, probably of fourteenth-century date.

An interesting article appears in the *Antiquary* for the present month on the Romano-British buildings at Stroud, near Petersfield, Hants, by A. Moray Williams, B.A., which with other south country examples illustrates what, for want of a better name, is now known as the "farmhouse" type of Romano-British building, and is to be carefully distinguished from the "villa," under which it has been too usual in the past to include all remains of residential buildings not clearly military.

THE SOCIETY OF ARCHITECTS.

The annual general meeting of the Society was held on Thursday evening, the 14th inst., at Staple Inn Buildings, Mr. George E. Bond (President) in the chair.

The President announced that a students' social evening would be held on November 8 at St. Bride's Institute, together with an exhibition of students' sketches prepared during the year.

The following gentlemen were elected members:—Messrs. Charles W. Ball, H. W. Burton, W. Dingwall, B. E. Evans, O. B. Hatchard, C. H. Heathcote, and R. Morley.

Colonel F. S. Leslie, R.E. (Hon. Secretary), read the Twenty-fifth Annual Report of the Council.

The President said he had very great pleasure in proposing the adoption of the report, and he was sure the members would consider it satisfactory—possibly the most satisfactory the Society had ever had to present.

Mr. G. A. T. Middleton seconded the motion, and said the report was particularly favourable, insomuch as the Council were able to show an increased surplus in their balance sheet when there had been great depression in the architectural profession, and especially as one of the architectural bodies had had to face a continually decreasing balance due to the present bad times.

The report was unanimously adopted.

Mr. E. W. Harvey Piper read the Scrutineers' Report for the election of officers and members of Council for the year 1909-10.

The results were as follows:—

President.—George E. Bond, J.P., Rochester.

Vice-Presidents.—J. W. Dyson, Newcastle-upon-Tyne; Percy B. Tubbs, F.R.I.B.A., London.

Honorary Secretary.—Colonel F. S. Leslie, R.E. (Past Vice-President), Woolwich.

Honorary Treasurer. — Henry Adams, M.Inst.C.E., London.

Honorary Librarian.—C. H. Mead, M.R. San. Inst., London.

Council.—R. George Bare (Past Hon. Librarian), London; G. A. Birkenhead, Cardiff; B. D. Cancellor, Winchester; T. R. Clemence, Guildford; R. Cecil Davies, Chester; R. A. Jack, London; Cholton James, F.R.I.B.A. (Past Vice-President), Cardiff; E. M. Leest, J.P., Devonport; H. W. Matthews, Bath; G. A. T. Middleton, A.R.I.B.A. (Past Vice-President), London; E. C. P. Monson, F.R.I.B.A., London; A. J. Murgatroyd, Manchester; Thomas Overbury, Cheltenham; E. J. Partridge, F.S.I., Richmond; J. H. Pearson, London; E. J. Sadgrove, F.R.I.B.A., London; B. R. Tucker, M.R. San. Inst. (Past Hon. Treasurer), London; R. Willock, F.R.I.B.A., London.

The President returned thanks for his re-election to the chair and the continued confidence of the members.

Colonel Leslie, referring to his election to the hon. secretaryship, said it would be difficult to follow a man like Mr. Ellis Marsland, and he hoped that when the latter had had a year's rest they would be able to have him back again in office.

Votes of thanks were passed to the retiring members of Council, the scrutineers (Mr. E. W. Harvey Piper and Mr. Sidney Marsland), and to Mr. C. McArthur (the Secretary) and the members of his staff. The meeting then terminated.

PANELS IN THE CATHEDRAL OF TORCELLO.

In Italy, within churches whose exterior aspects are plain and unattractive, may be found exquisite work of the sculptor or painter. The exterior of the cathedral at Torcello does not give promise of the rich sculpture within, of which the two panels represented are remarkable examples. These panels form part of the west side of the low dividing wall of the choir portion of the church, and are, therefore, so placed as to be readily seen. They attract attention partly because they are ornamental, partly because of the subjects which they represent. They date from a period (1008 A.D.) when sculptors delighted in intricate patterns which led the observer to try and thread the maze of lines. Even what is representative, in a greater or less degree, of real things, and not mere pattern-making, is made to conform in some cases to decorative effect, as when beak-head forms are reiterated round an arch. In one of the panels (Fig. 1) the branches

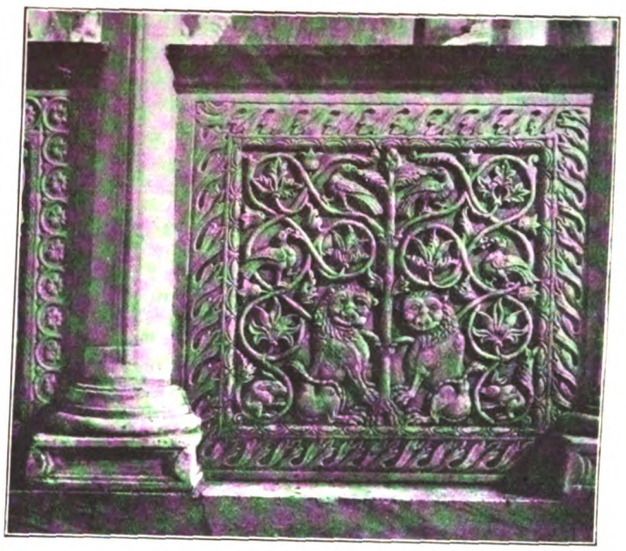


Fig. 1.—PANEL FROM SCREEN, TORCELLO CATHEDRAL.

of the trees assume forms which are too regular and too curvilinear to be realistic, and the tails of the lions are in pattern-form. The ornamentation on one side of the panel so nearly balances that on the other as to lead to the supposition that the variation in the expression of the two lions is a matter of chance. Their eyes, nostrils, and mouths are made by drill-holes, which are also a means towards attaining the rich effect in the foliage of the tree. The tree takes its root from the middle of the bottom of the square, and spreads over nearly the whole of the panel, forming openings for foliage, doves, and, in two cornices, for hares. Six of the smaller openings are filled by calices. The border is composed of a recurring foliage-pattern, the continuity being lost at each corner. It may be supposed that the lions were intended to be formidable and in contrast to the timid hares. Lions in pairs are frequently found at the entrances to churches in Italy, and they may in this position be generally taken to represent sentinels or guardians. It was said of the lion that he slept with open eyes, and Peter Valerian, amid the many meanings which he thinks may be assigned to the lion, includes that of vigilance and guardianship. He says of the lion, "Somni parcissimus est, oculosque habet inter dormiendum splendescentes ac quodammodo patefactos." In the sense of guardians are to be interpreted the lions of the gate of Mycenæ. The grouping, therefore, of two lions to represent guardianship goes back long before the Christian era. Although the position of the lions may be an imitation of representations in which the idea was of guardianship, such an idea is not very appropriate here, for although the panels are in the screen-wall of the choir, yet from Fig. 2 it will be seen that the peacock panel is nearer the entrance.

With Christianity many and varied symbolisms became attached to the lion, and in the absence of some indication from position and surroundings there is an "embarras de richesse" of possible meanings. It may be that in these panels the lions are symbolical of the Resurrection, and as the peacocks have the same symbolisation there is more possibility that they were both selected as representing the same idea, though for different reasons, the peacock because it renews its plumage, the lion because it was said to be born

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dead and aroused to life after three days by the roaring and breathing of its male parent. It does not, however, appear by any means certain that sculptors of this period associated their different subjects in a very reasoned way. They may,

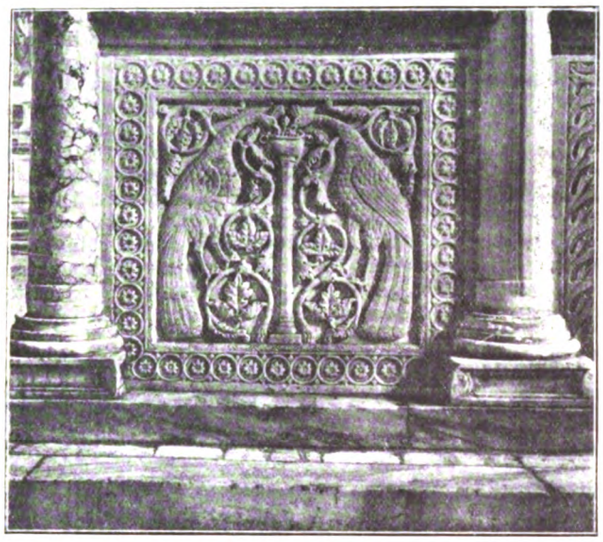


Fig. 2.—PANEL FROM SCREEN, TORCELLO CATHEDRAL.

in many cases, have regarded decorative effect first. At any rate, it is not easy to account for all subjects in the same way, as in the majority of cases lions at the portals of churches and peacocks on tombs may be explained. The sculptor of these panels has, in any case, produced remarkable works. Although marble was his material, he has known how to use his tools so as to produce magic effects of light and shade.

BRITISH SCHOOL AT ATHENS.

PROFESSOR GILBERT MURRAY presided on Tuesday over the annual meeting of subscribers to the British School at Athens, held at Burlington House.

The managing committee in their report state with regard to the excavations that the sanctuary of Artemis Orthia has now been finished, the Menelaëum has been excavated, and the more promising parts of the site of the ancient city examined by a series of trial-pits, with the result that it seems hardly likely that any site of importance remains for future excavation. A large trench was made in the theatre from the top of the auditorium to the orchestra, and it appears that the building is very much destroyed. In the lower parts the depth of earth is very great and houses have been built at a higher level, a process which has probably left very little of the theatre remaining.

Sanctuary of Artemis Orthia.—The additions made to our knowledge by this last year's campaign are best seen by comparing the latest plan with the plan published a year ago. The walls of the sacred enclosure at different periods have been found in great part, especially behind the temple and to the east of the altar. An investigation of the lower strata has shown that the archaic altar and primitive temple are later than the cobble pavement with which the hieron was paved, and the walls of the hieron at this early period have now been found. This gives an earlier stage of the sanctuary than had before been clearly made out. In this earliest stage the precinct was smaller than in subsequent periods and the centre of the cult nearer to the centre of the hollow in which the sanctuary stood. This is shown by the position occupied by the deposit of black sacrificial ashes. At this stage there seems to have been no temple, but there are remains of what was probably the altar. The first stage of all is represented by the ashes and geometric pottery found below the cobble pavement. In order to carry through this work a further small portion of the foundations of the Roman amphitheatre was removed.

In the first year of the work part of a large subterranean water-channel was discovered, and this has now been fully excavated. It dates probably from the fourth century B.C., and was broken into and largely destroyed by the building of the Roman amphitheatre. Solidly built of dressed stones and roofed with large slabs, it is a remarkable work, and very probably was constructed to carry off the water of a natural brook that in early times may have flowed down to the Eurotas through the hollow in which the sanctuary lay.

The archaic deposits proved to have been nearly exhausted in previous campaigns. Some important objects were, however found, notably an ivory plaque representing the winged Orthia with a bird and a snake. This absence of finds from the outlying parts of the site satisfactorily proves that the whole sanctuary has now been exhausted and the full harvest reaped. The final publication of the objects found has still to be undertaken.

The Menelaëum.—In May we were led to excavate the building which has been for long identified with the Menelaëum. This building stands on a hill overlooking the east bank of the Eurotas, with a commanding view of the site of Sparta. The result is a plan differing materially from the sketch plan published by M. Kastriotis, who had already excavated the site. The building now reveals itself as an oblong platform which may have supported a small temple or other monument. This platform stood upon another, from which it was reached by a ramp, the traces of which are preserved. To this structure a terrace was added later on two sides. The date may be the fifth century.

An interesting series of bronzes, notably an archaic figure of a woman, terra-cottas and lead figurines were found. The pottery was especially interesting as filling up a period (Laconian II.) which is not well represented in the series from the Orthia sanctuary. The majority of these finds were made on the slope below the building in a position which showed that they had been thrown out from it. Some of these certainly belonged to a period earlier than the present building, and some blocks were found which probably formed part of an antecedent structure.

Below all the other finds some undoubtedly Mycenaean sherds were discovered, and some Mycenaean houses, as yet only partially examined, were found a short distance away. This Mycenaean settlement will form the subject of future work.

N. Greece.—The subsidiary excavations carried on last year in N. Greece by Messrs. Wace, Droop and Thompson have been resumed.

These excavations are designed to throw light on the early civilisation of N. Greece. Two sites were selected for this season's work—Palaeomylos, near Lianokladi, in the Spercheios Valley; and Tzani Maghoula, near Sophades, in W. Thessaly. At Lianokladi the excavators were at once successful by sinking deep shafts across the mound to the level of the virgin soil. They found three well-marked strata, in the lowest of which were sherds of the "red and white" ware akin to, though of finer style than, that which has been found in Thessaly and Phocis.

In the stratum above this the pottery changes completely and is of the "black lustre" style similar to that found at Orchomenos by Dr. Furtwängler. The pottery of the third and topmost stratum was of a type hitherto unknown, a reddish-brown hand-made ware with black geometric patterning, which the excavators are disposed to regard as contemporaneous with late Minoan III.

At Tzani Maghoula, as at Zerelia last year, no less than eight successive settlements were excavated. The stratification here is particularly good and will make it possible to correlate this with the other prehistoric sites of N. Greece. Among the more important finds were two or three nearly complete "red on white" vases from Settlement VII., and a fine collection of bone pins.

Rhitsóna.—The excavations at Rhitsóna, in Boeotia, were continued by Professor Burrows from March 29 to April 17, with the help of a grant from the University of Manchester. His primary object was to obtain further light on certain problems raised by the first season's work, and he excavated with special attention to the bone remains. He was fortunate in receiving a visit from Mr. C. H. Hawes during the excavations, and in securing his services later for a detailed examination of the bones in the Thebes Museum. Of the twenty early graves excavated, a large number contained undoubtedly single interments, and thus support the view maintained by Professor Burrows and Mr. Ure in *B. S. A.* xiv., that this was the normal practice at Rhitsóna. Their theory as to the late date of what they have called the Boeotian Kylix style is also supported by a number of tombs now found that contain proto-Corinthian or good Corinthian, but no Boeotian kylikes. The number of vases excavated was, as before, very large. Among individual finds may be mentioned some Corinthian Black Figure or "Rottonige," the first found on the site, and an interesting stone sarcophagus, conveyed entire to the Museum at Thebes,

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containing a complete skeleton, proto-Corinthian vases, and iron fibulæ.

Professor Gilbert Murray, in returning thanks for having been invited to occupy the chair, said he was particularly glad of the honour because it was a recognition of the essential unity of Greek studies when one who was almost entirely a literary scholar was invited to address archæologists. The time had passed when literary scholars could afford to speak slightingly of archæologists, and when archæologists were goaded into a reciprocal contempt for scholarship. It had come to be recognised that the whole of Greek life and thought was too vast a subject for one man to master, and also that every single department of it was dependent on every other. Professor Murray said in his own work he could hardly move a step without referring to archæologists.

If the work done for Greek studies by the School of Athens could be summed up in a single phrase, it would be that it made them real. It takes new men every year to the soil of Greece, it lets them handle the actual stones of the Parthenon and the Erechtheum, and study the actual marks of a fifth-century chisel, and learn much else that could never be found in a book. It had, apart from the positive discoveries, effected a change in the quality of our knowledge. The discovery of concrete objects at every turn has permeated the whole study of Greek and made that concrete also.

Much was to be said in favour of a classical education. It involved the study, first, of language (one of the richest and most educative subjects possible), and, secondly, of a particular period of human history. In the case of Greek that period was one in which life was not only extraordinarily interesting and progressive, but also to a great extent, compared with later times, undifferentiated. Whoever has studied well that one moment in the life of mankind will use more of his mind and have obtained an introduction into more phases of human thought than anyone beforehand would have thought possible. That classical education has in the past sometimes failed is chiefly owing to three causes, viz., lack of variety, lack of concreteness, and lack of progress and discovery. The remedy for this was to be found in the work of the British School.

The present condition of classical studies in England was encouraging, for the standard was never so high, and it was doubtful if there were ever so many individuals who knew Greek. This optimism was felt despite the loss of the educational monopoly. There were abundant signs that Greek was a flourishing and not a decaying study. At no time were the masterpieces of Greek art so well known as at present, and often not merely known by sight, but intelligently and lovingly studied. People in most unexpected callings and places seek advice as to learning the language. A company in New York is wanting to act Greek plays, not merely for edification but for commercial purposes. Certain semi-philanthropists who wish to act poetical plays in the slums have decided to commence with a Greek tragedy. In another case a railway servant and his wife wrote for advice about learning enough Greek to read Plato. They had already learnt sufficient to read the New Testament by means of a weekly newspaper which gives every week a bit of Greek grammar and a reading lesson. Such students as these two would be more valuable than twenty reluctant public schoolboys forced and cajoled through Pass Mods. The monopoly of classical education has certainly been lost through the abolition of compulsory Greek. But now a much larger possible field has been thrown open.

The whole of Hellenic study is organically inter-connected, and the man who collates MSS. of Homer, who sifts and analyses tons of Thessalian earth to collect and date a lot of broken pots and figurines—most of them ugly—who teaches a bit of Greek grammar so that it is understood and remembered, all alike and together are serving in the common task and helping to keep alive an ideal which the world must never be allowed to forget, the great complex of noble imagination, keen sensitiveness to beauty, of hard thinking and strenuous endeavour which bears the name of Hellenism.

The proposal of Professor Murray to adopt the annual report was seconded by Mr. H. H. Statham, F.R.I.B.A.

Mr. R. M. Dawkins, the Director, then proceeded to give an account, illustrated with lantern views, of the various excavations carried out by the school during the past year.

Mr. Frank L. Pearson, F.R.I.B.A., has been appointed to advise the Maidstone Urban Council as to the best course to adopt for restoring the west front of the Old Palace.

COMPETITIONS.

THE Secretary of the Royal Institute of British Architects desires us to announce for the information of architects proposing to take part in the competition for the Warrington elementary school that the R.I.B.A. competitions committee are corresponding with the promoters with a view to the amendment of the conditions of this competition.

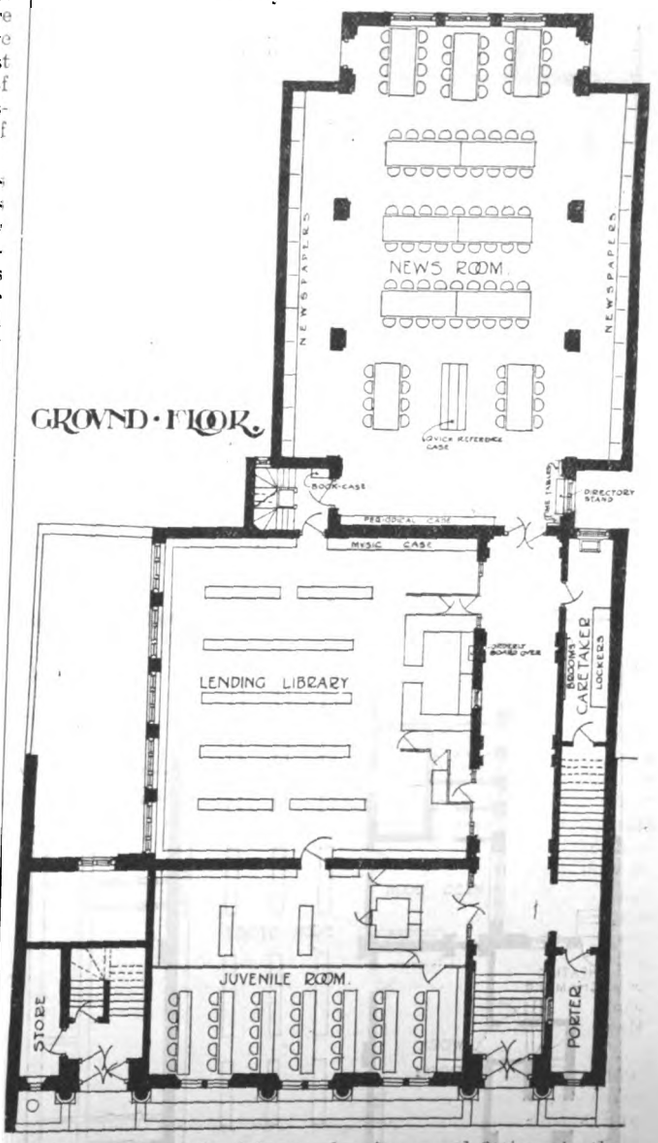
The probable result of this correspondence may be judged from the following:—

At the meeting of the Warrington education committee on Monday night the sites and buildings committee reported that communications had been received from the Royal Institute of British Architects and from architects in reference to the conditions of the architectural competition for the Evelyn Street Council school, but the committee could not see their way to make any alteration in the conditions beyond allowing the return of the deposits to those architects who return the conditions and planning rules.

ILLUSTRATIONS.

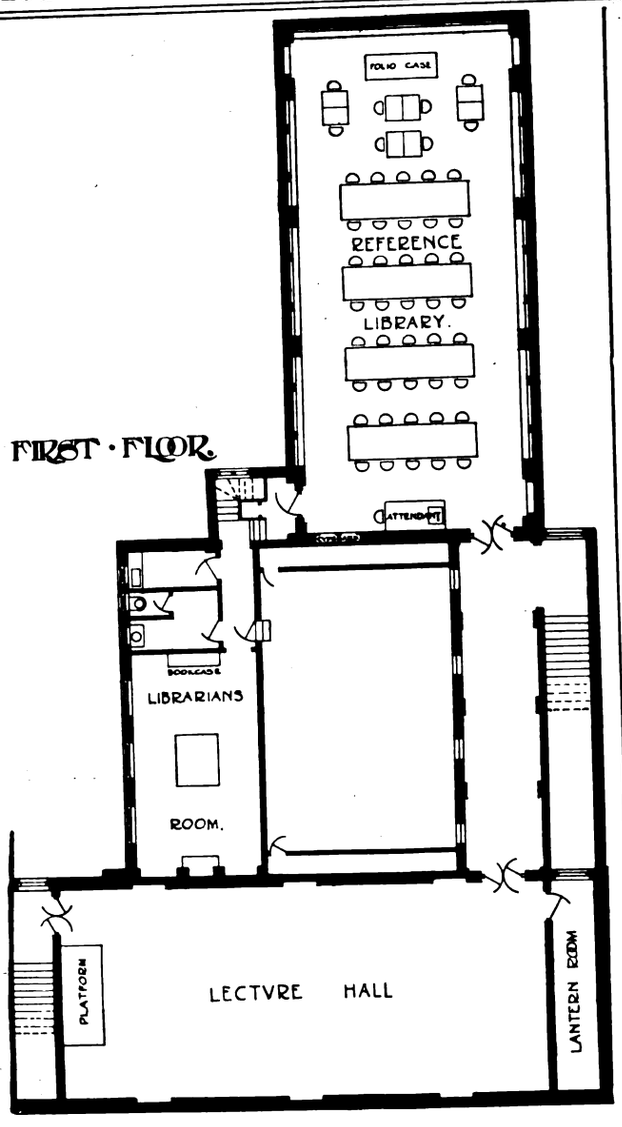
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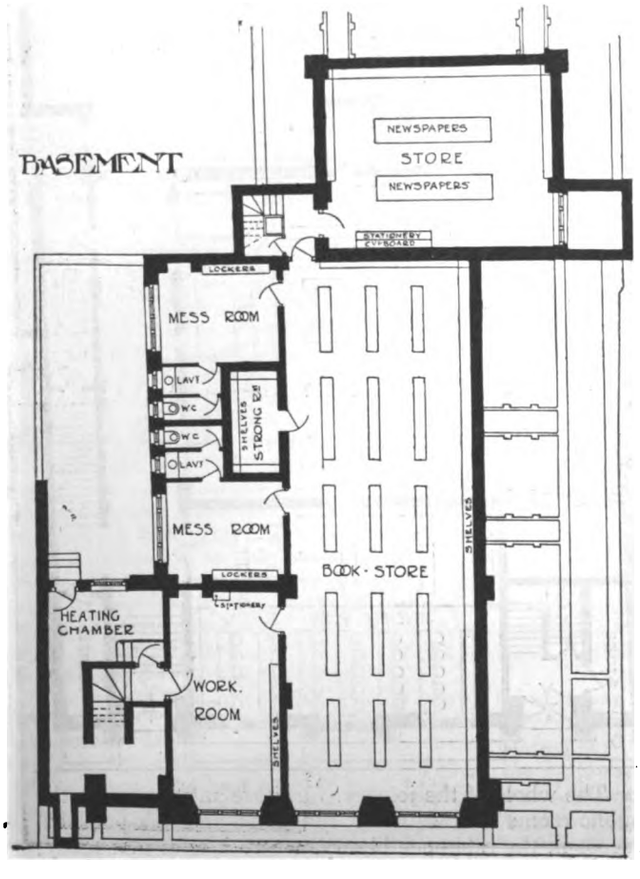
THE site is a somewhat unusual one, being narrow in frontage and of considerable depth. This has necessitated the main entrance being at one side, the newsroom occupying the entire width of site in the rear, and being lighted from the end and by a clerestory along each side. The floors and staircases throughout are of fireproof construction. The front elevation is of small-sized red bricks with Portland stone dressings, and the roofs are covered with Precelly slates.



The whole of the joinery, furniture and fittings in the public rooms is of wainscot, fumigated and wax-polished, except in the reference library, where it is of mahogany,—

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stained dark and French polished. The floors throughout are covered with linoleum. The heating is by low-pressure hot water, and all rooms are ventilated by an electric fan placed in a central position. Mr. Henry T. Hare, F.R.I.B.A., is the architect.

The general contractors were Messrs. F. & H. F. Higgs. The principal sub-contractors were:—Fireproof floors and steelwork, Messrs. Aston & Son; steel casements, Messrs. Pearse & Co.; heating and ventilation, Messrs. Jeffreys & Co.; electric lighting, Messrs. Higgins & Griffiths; scagliola, Messrs. Bellman, Ivey & Carter; ironmongery, Messrs. Ramsay & Co.; carving and modelled plaster, Mr. L. A. Turner; front railings, Mr. Nelson Dawson.

THE GARDENS AT CHELWOOD VETCHERY.

THIS drawing, which was exhibited in this year's Royal Academy, illustrates a yew-walk or bowling-green lying due north and south, and connecting the park shown in the distance with the gardens. This walk is also intended to divide the kitchen-garden from a proposed triangular scent-garden shown on the right of the drawing. The remainder of the gardens are terraces, croquet-lawn, lower terrace with lily-tanks and water-channel, tennis-lawn and a "bosquet," all of which lie in terraces in the order given to the south-west of the house, and are linked up on the south-east side by a wide grass path bordered with wide flower-borders. The yew-walk also connects with this grass path.

The garden has been cut entirely out of a wood, interesting as surrounding the site of a hunting-lodge of John of Gaunt. The soil was for the most part very fine sand over sandstone. The retaining walls and steps are of local stone built dry, with the exception of those near the house, which are built in mortar with balustrading, and gate piers of small sand-faced, cherry-red bricks, made locally by the contractor, Mr. Job Luxford, of Forest Row. At either end of the house are a sunk garden and a rose-garden, the latter having brick-paved paths and being screened by a high oak trellis between brick piers. The gardens were arranged by Mr. L. Rome Guthrie to surround a charming house designed by Mr. William Flockhart, F.R.I.B.A., in the Tudor style.

OXFORD COLLEGE SERIES, BRASENOSE.—SHOWING RATCLIFFE CAMERA AND ST. MARY'S SPIRE—LIBRARY.

IN our issue of October 1 we gave a descriptive account, by Mr. John Buchan, of Brasenose College, and in the preceding week we illustrated the college as seen from the High Street and the Chapel Quad.

LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.—DESIGN FOR ART GALLERY.

THIS drawing is an example of the work done by students at the Liverpool University School of Architecture, and is referred to in our leading article.

The Original Drawings made by Mr. Louis Weirter for Archdeacon Sinclair's "Memorials of St. Paul's" have been purchased by the South Kensington Museum.

The Foundation-stone of St. Martin's Church, Worcester, was laid by the Countess Beauchamp on the 9th inst. The church, which is designed to accommodate 800 adults at a cost of about 10,000*l.*, will be of Worcestershire red stone rock-faced externally, and the interior facing will be of brick, with Box-ground stone dressings. Messrs. J. & A. Brazier, of Bromsgrove, are carrying out the work from the designs of Mr. Geo. H. Fellowes Prynne, F.R.I.B.A., architect, of Westminster.

Messrs. Walker & Ramsay, 123 Wellington Street, Glasgow, have been appointed as architects, and Messrs. Henry Herbertson & Co., 167 St. Vincent Street, Glasgow, as measurers for the Scottish Historical Exhibition, which is to be held next year in Kelvingrove Park. The guarantee fund of the Council is already 75,315*l.*

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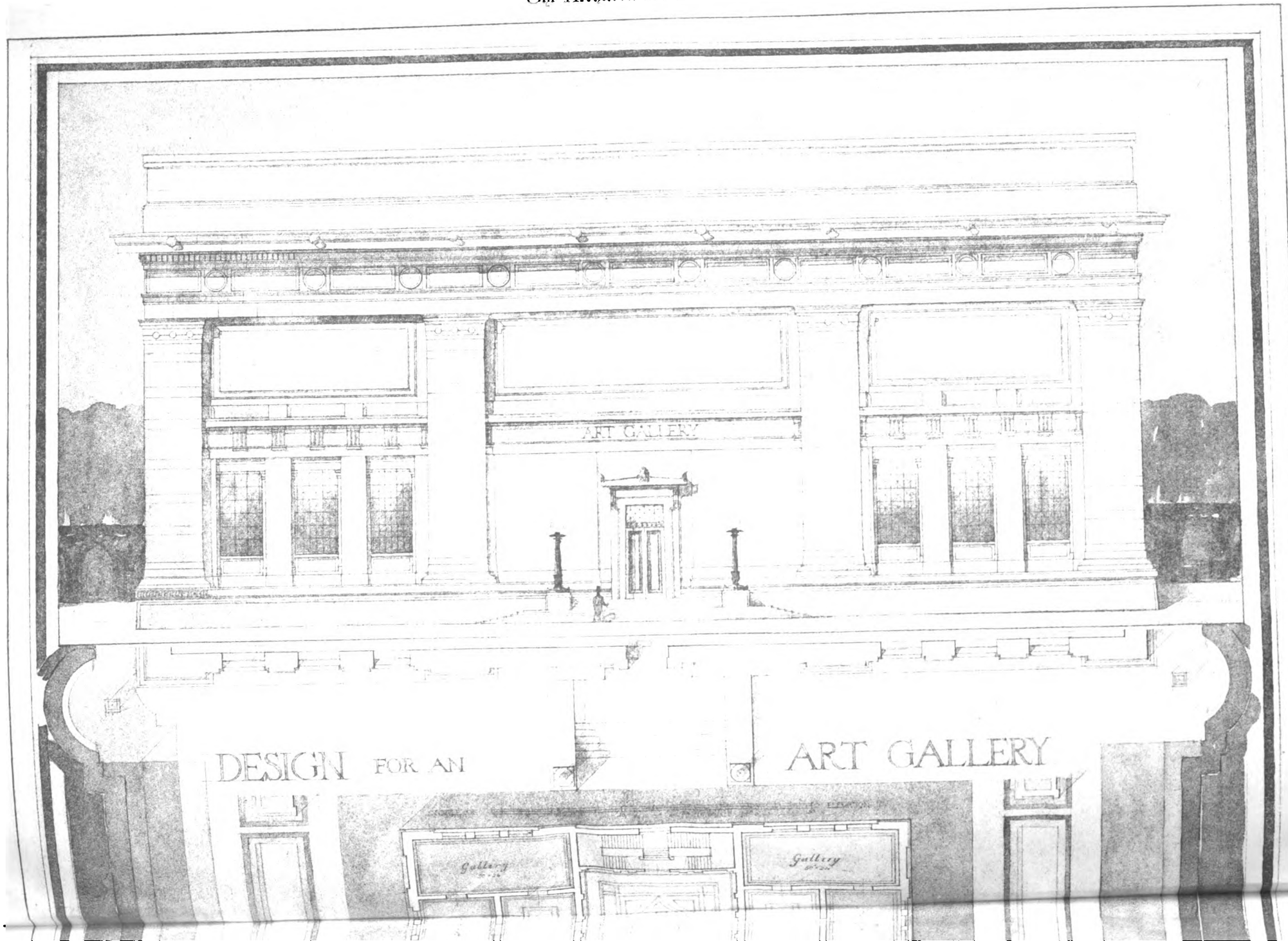
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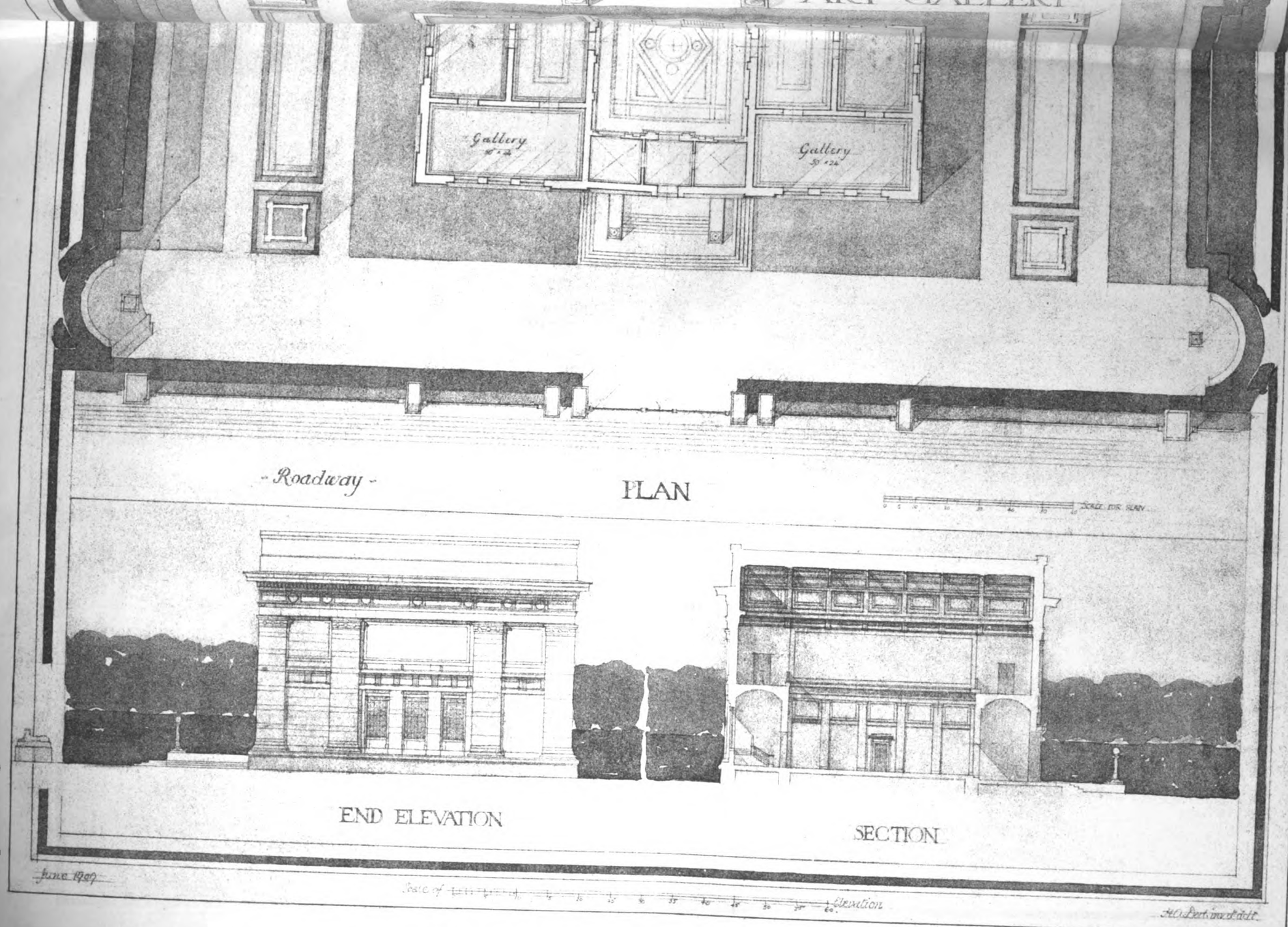
OXFORD COLLEGE SERIES. No. 57.—BRASENOSE: SHOWING RATCLIFFE CAMERA AND ST. MARY'S SPIRE.

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LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

DESIGN FOR ART GALLERY. By H. A. DOD.

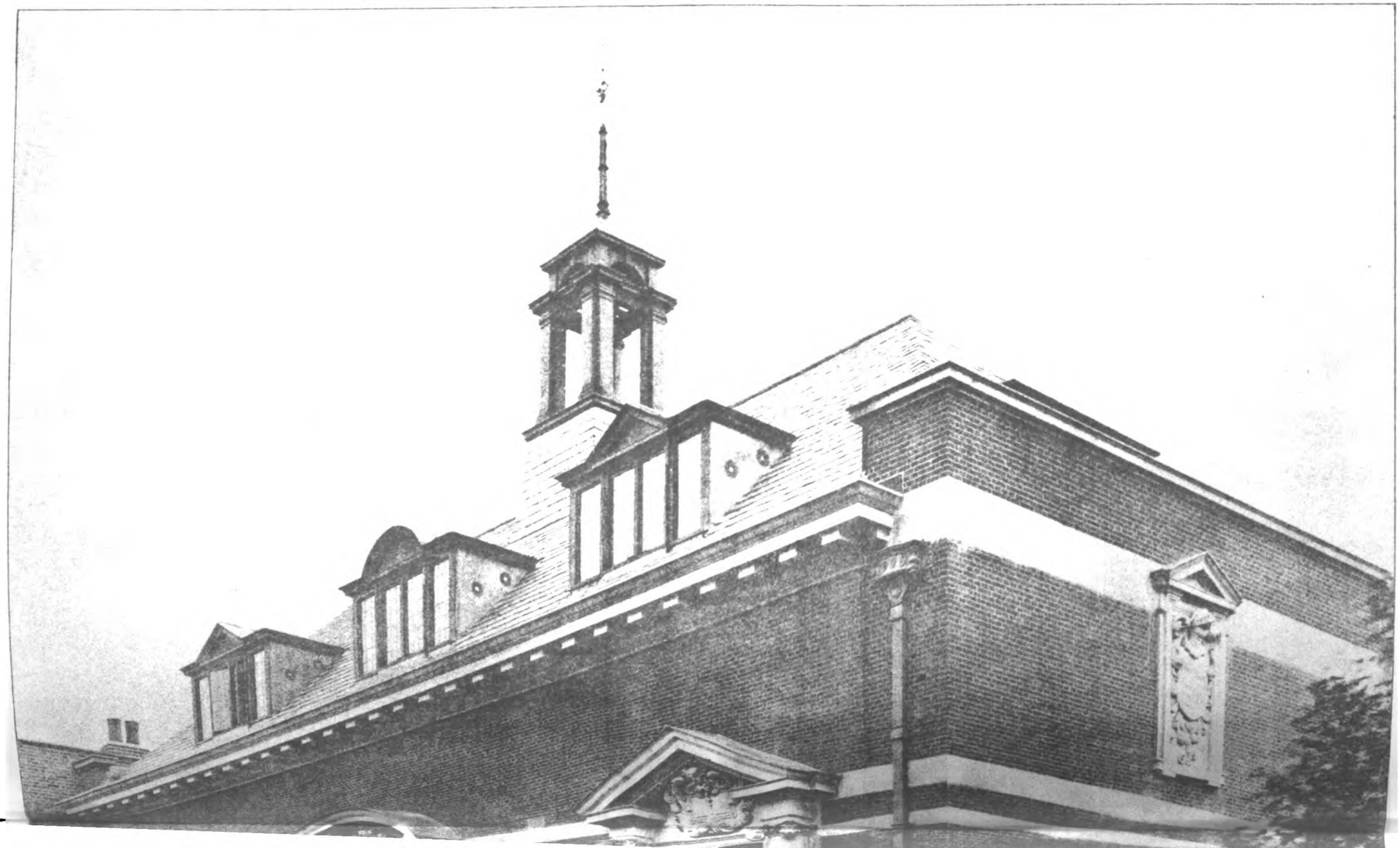
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PHOTO BY ERNEST MILNER, 80 THE GROVE, WANDSWORTH, S.W.

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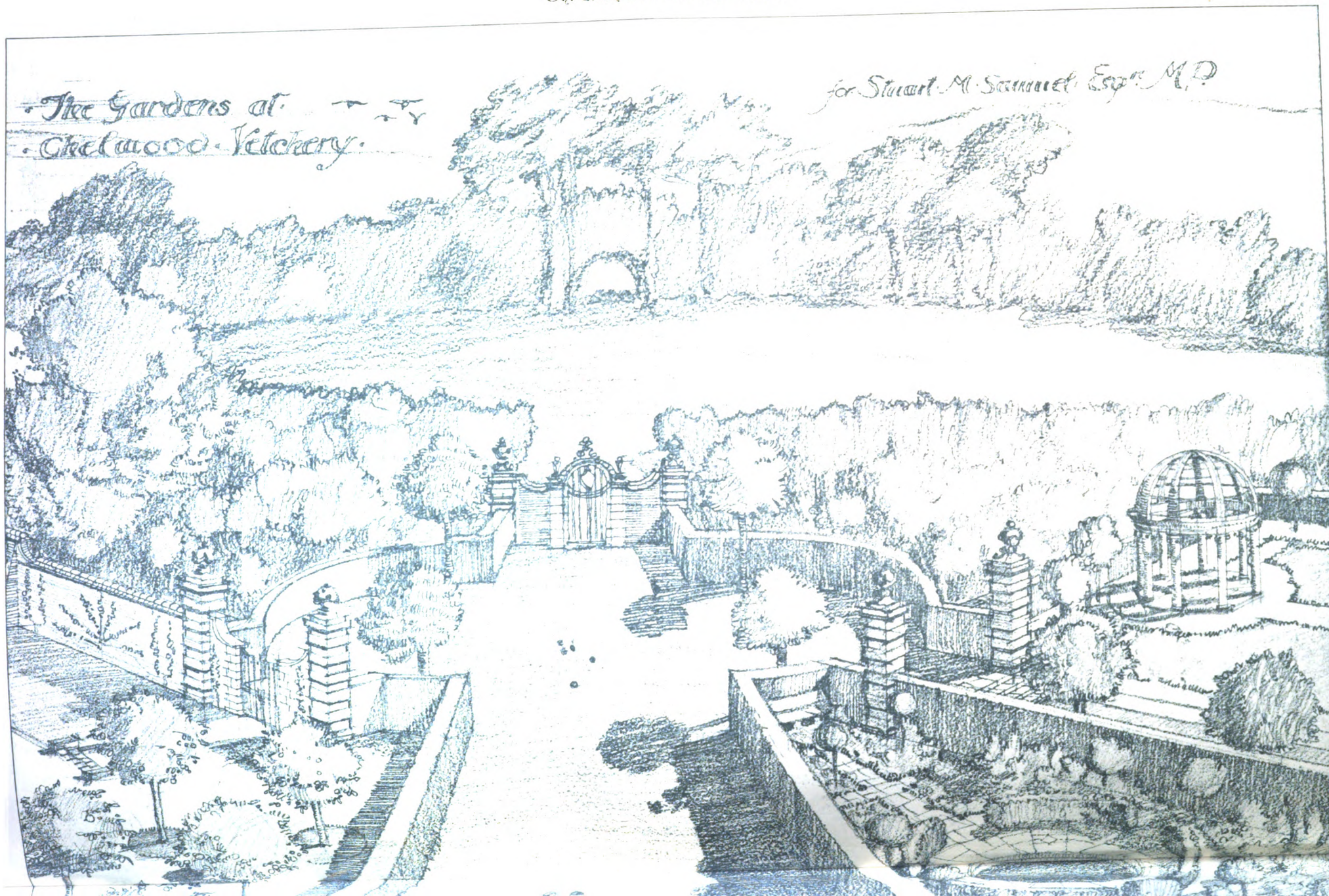
HENRY T. HARE, F.R.I.B.A., Architect.

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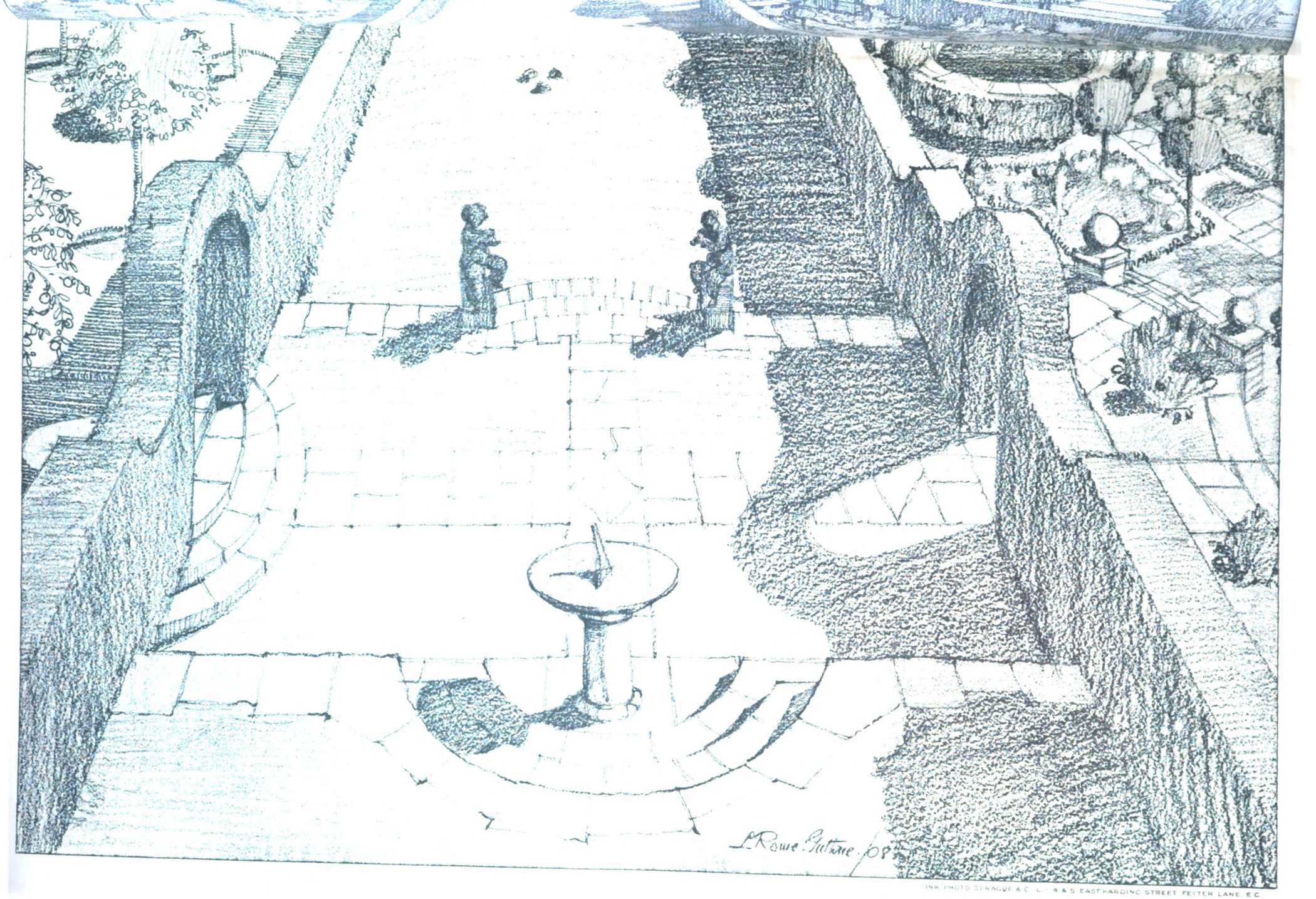
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OXFORD COLLEGE SERIES. No. 58.—BRASENOSE: LIBRARY.

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THE ARCHITECTURAL ASSOCIATION.*

(Concluded from last week.)

THE Water-colour Class, which must surely be a favourite subject with the majority of us, is languishing for lack of support, and is likely to die out like the Modelling Class a few years back. The Life Class, too, has to hunt for members, whereas the room should be really far too small to hold all the applicants; why it is not fully attended it is difficult to imagine. The younger members have their hands already full, but those who have done with the schools surely would do well to turn their attention and part of their spare time to this instructive and delightful branch of art—the study of the figure from life.

I trust, gentlemen, that you will forgive me for this little disquisition on our shortcomings, or what is more important, I hope you will consider it, and that the Architectural Association will profit by it. I do not think there is any value on an occasion like this in looking only on the bright side of things and disregarding those less satisfactory, or else those departments suffering under the shade of adversity would continue to do so while the more favoured, basking in the sunlight of the Architectural Association favour, would continue to flourish like a green bay-tree, whose spreading leaves would only add more to the obscurity in which the others languish.

A propos of the bad times from which most of us are suffering at present, I should like to tell you that the Council is always ready and anxious to help our men to the best of its power, and the desire of the members is to aid rather than harass, as regards paying subscriptions, &c., those who are found to be in straitened circumstances. The register of assistants, too, is now only open to members, and we have been able thereby to find work for more Architectural Association men than before, and I believe that there is a very material benefit derived from the alteration.

It has occurred to some of us that there is not enough social life in the Architectural Association; that we meet so almost entirely in working hours, and consequently so seldom in moments of leisure, that the men of various decades do not get to know one another, and we should like to see more of the men who no longer wish to come here to study, but I suppose that their absence must be ascribed to the natural reaction after the years of hard work. However that may be, we are thinking of flattering the Royal Institute in the sincerest form, *i.e.*, imitation, by copying—on a smaller scale, of course—the "At Homes" which have proved so successful with the senior body. I hope if this can be arranged that the members will give the Council their support, as it is only by the aid of mutual confidence and assistance that a body like the Architectural Association can hope to be successful, and we are now so numerically and geographically extended that it is only at such evenings as I suggest that a large number of our members could or would ever meet; we have in the Museum premises well suited for such entertainment, and this recalls the fact that we have still the Architectural Museum apart from the Architectural Association as an annual charge on us, though it was formerly supported entirely by subscription, and I hope that the public and all interested in architecture will not forget this, as we seem in danger of not being able to maintain our list of subscribers, new ones not coming forward to fill the gaps unfortunately caused by the loss of former members, in which connexion we have to deplore the death of such men as Lord Ripon and the Hon. Dudley Fortescue. The collection of casts which we possess will bear comparison with any in the country, and we have spent a large amount on the Royal Architectural Museum in order to get it properly housed and arranged, in the hope that it would prove more useful to all students of the many styles of work which are represented in it.

Of the many branches of the Architectural Association, the educational is, of course, the most important, in fact the whole organisation is being run more and more with this department in view as the main object. Since our school was started more have sprung up in every direction, and I see that one is now being started in Birmingham, and when there are enough schools to educate all those seeking an architectural training, which time rapidly approaches, I imagine there will be ample support to the proposition put forward in the papers a short time back, of a diploma course in architecture, and over which there was a great amount of discussion; the different schools naturally shape their studies on varying lines, quot homines, tot sententiæ, and I think it ill becomes any among them to lay down the law as to which is the best; the diploma course would attract the best men from each centre, and the various systems could be compared by results. The proof of the pudding is in the eating, and we, I am sure, have here a very good pudding, though there may be others of a different make more to the liking of the cooks who have had a hand in the mixing.

Our students' exhibition of work this year was a very good one, a general level of excellence being maintained which always speaks well for both masters and students. Mr. Maule, Mr. Varndell, and all the other masters work most conscientiously for the welfare of the students, who in turn must, I am sure, ably second their efforts to produce some of the work we have seen, and I am confident that in our two years of day school study and two of evening school, the students receive a very valuable and sound grounding in their work, which must be most useful to them in after life, and very different to the scrappy and haphazard fragments of architectural pabulum from which the students of even ten years ago extracted what education they could; but there is no doubt that our nourishment could with great advantage be followed up and amplified by the course of higher studies, which cannot be embraced in the short time at our disposal here.

The Camera and Sketching Club is another flourishing department of the Architectural Association, and I think that is largely owing to the energy and administrative power of Mr. Alan Potter, who has devoted a great deal of time and trouble in working up the club, backed up as he must be by a hard-working committee. Their excursions, particularly abroad, seem to me to be wonders of comprehensiveness, and of great value to the younger members, as they are, I believe, run on the cheapest methods and on bicycles. The latter method of locomotion does not perhaps recommend itself very strongly to some of us who prefer the comparatively luxurious and very complete methods of transport arranged on the Architectural Association annual excursion by our excellent Hon. Secretaries, Brown and Hennings. I do not intend to intimate that the excursion is run for the older men only; far from it, we welcome gladly new and young men, and I can guarantee this, and I feel sure those who have experienced it will agree with me, that no one is ever allowed to feel lonely or apart—all are friends, and our efforts are directed to making all enjoy themselves, which is none the less possible because we have a very full week and get through a lot of work.

The photographic work of the Camera Club is becoming increasingly useful to the Architectural Association; the collection of slides, now numbering 4,000, contains examples of almost every style of architecture, and is of the utmost value to lecturers and readers of papers, and I venture to think there are very few subjects connected with our profession which could not be illustrated, to some extent, from the collection.

Our Athletic Club numbers over 200 members, an increase of fifty during the last year, and I am very glad to see it in such a flourishing condition, as personally I take a great interest in athletics, and the club is one which exercises a powerful influence for good in every one of its members. Sport improves every man's character, and teaches him to lose well, as also to win well, and the title of a "good sportsman" is one that every Englishman covets, for it does not only refer to the athletics we indulge in, but to our efforts in the serious game of life; a healthy mind flourishes best in a well-developed body, and physical fitness is the best aid to good work, and the record of the athletic men in the schools here is no exception to the general rule.

The sports annual meeting is one which I should like to see better attended, and one which Mr. J. H. Squire even suggests might be made an official summer reception, and I hope next year we shall get a better attendance, although on the last occasion those who were present made up, as far as is possible, by their enthusiasm for the numerical failure. The rifle section, which supplies the largest contingent, encourages Imperialism in a practical form by supplying a good number of Territorials to our home defence, for which reason alone every one who is in a position to do so should subscribe to it. The Rugby football section is one of which we have reason to be proud, as the record for this year shows a very high percentage of wins; and if sufficient support is forthcoming—and I have already several names—I hope to start a golf section this winter, and as the game has now become so popular, I trust we shall have no difficulty in getting together as good a side as in all the other athletic branches.

It would not be possible to review the various subsections of the Architectural Association without mentioning the Musical Society and its worthy Hon. Secretary, Mr. P. W.

* President's address at the opening meeting of the Session on October 8 last.

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Lovell; it is a body which caters largely and frequently for our entertainment, and incidentally I may say I should like to see more supporters of this deserving section. It is not necessary to be a musician to join—that is not within the power of many of us, but it seems very hard that men who work so well should also have to pay out over the play when the performance is given for the benefit of the community. The last play unfortunately did not pay its way, and the burden of the debt lies heavy upon us, so that any subscription towards the deficit would be very welcome, as it is only by this means that the debt can be wiped out.

I am afraid that you will all begin to think that my address to-night savours too much of a charity sermon, or even worse, for on such an occasion you would be asked to loosen your purse-strings for one object only, while I have asked for assistance for many; but remember it is the workers we want in all branches—art, science, and recreation—even more than the subscriptions, and if each of us were to devote some small portion of his time to one only of our various branches we should be in a very satisfactory position.

Among the happenings of general architectural interest during the last year, the Housing and Town Planning Bill is one of which we were led to expect a great deal of good, but the more recent legislation which is being framed with regard to land taxation would seem to have a malevolent influence on the maintenance of open spaces in towns, at any rate, by private people. However, it has been said that religion and politics are the Scylla and Charybdis of public speaking, so I must refrain from enlarging on this subject or I shall be drawn into the whirlpool, but I cannot help saying that it would have been much more satisfactory if the disinterested offer of help from the Institute had been received in better part by the authorities in charge of the Bill, for if there is one thing on which the heads of our profession should be consulted it is surely this, and a good architectural result might then be obtained quite compatible with sound engineering requirements and a satisfactory financial result.

The Patents Act has benefited us to some extent, owing to the factories which now have to be put up here by the foreign owners of patents registered in this country, but on the whole there is a decided tendency just now to leave building alone until some clear idea is obtained as to the final imposts which land will have to carry.

We are to have further legislation by the London County Council under this year's General Powers Bill in which the claims of steel as a reliable building material are properly recognised, and it allows the erection of steel-frame buildings throughout, *i.e.*, instead of the thick outer walls formerly required, we may now have thinner panelled walls with steel framing; but, on the other hand, the internal structure is now to be subjected to further supervision, this part of the building being rightly held to be an integral part of the outer shell, whereas with the brick outer shell such was not the case; but a heavy responsibility is being laid on the London County Council and the district surveyors, as they will be answerable for the stability of the new type of building, and I fear some amount of time must be lost in getting plans approved, and time is a factor on which our clients nowadays never fail to lay the greatest stress, and I must say I am inclined to think that taking the responsibility from the architect is a mistake; it means the work being done twice over and taking a large amount of interest out of our work, as the architect should be the author of the entire building, including the structure.

The strides made in ferro-concrete, which is recognised as a subject of future legislation in this Bill, have been prodigious, and though up till recently this type of construction has been utilised chiefly for engineering work, its influence is now being felt in our architecture, and this opens up a very wide question for consideration, for if this medium is going to be, as I think, the one utilised in our larger architectural works, we shall either have to take up the study of this form of construction with its attendant possibilities, or we shall find there will come into existence a ferro-concrete specialist who will take over the general construction of the building, and the architect will be relegated to the decoration of the interior and the design of the exterior.

This raises a point of supreme importance which we are sometimes inclined to overlook, we must design our work to suit modern conditions. It is impossible to insist on the acceptance by the public of the type of work which was suitable even twenty or thirty years ago; we have to face the problem and accept the present conditions and endeavour to treat them architecturally, instead of attempting to make modern requirements bend the knee to preconceived ideas of architectural treatment, and surely this can be the one way to evolve a style of architecture of our own, which can only be good if suitable to the conditions of the country and the requirements of the people.

I am referring here, of course, to the large commercial buildings in our cities, but in domestic work we have a freer hand, as the habits of life in the home can never change so thoroughly and so quickly as in the world of business. Why should not good architecture be produced with modern materials and to suit modern users? The steel column and beam are accepted facts—why hide them with an arch and a dummy pier? Why should not our construction be shown in our designs instead of being hidden or obscured as much as possible? There is no doubt that we shall have to evolve a new method of treatment for the modern types of construction, unless we are going to be content to let our architecture be a mere shell or screen of stone or whatever material we may elect to use, pegged or hung to the structural members, screening these from view without indicating their underlying form, as should surely be the case.

Architecture, we all know, constitutes an art and a science, and every year we live the latter component asserts itself more forcibly and will not be denied; it is becoming more closely interwoven with the artistic part of our work, and has a very material influence on the result, and we cannot shut our eyes to the fact and attempt to work only for the artistic. We can only produce an unsatisfactory result where we do not boldly tackle the problem with all the attendant difficulties; we cannot elect to deal with any question from the particular point of view which we desire, to the exclusion of the less interesting factors.

No one can fail to be struck by the general improvement in the attitude of the public towards town architecture of late years; planning of streets and open spaces has received so much more consideration, and the relation of individual buildings in connection with streets and adjoining work is not now so consistently disregarded. The average Britisher, to borrow a term from the other side, now takes a broader interest in architecture, and his horizon is not bounded by the particular buildings in which he lives or works; and as he educates himself the book opens, he knows the good from the bad, and begins to appreciate the former, and thereby creates a demand for that which we have to educate ourselves to supply.

With reference to domestic work, we have many men carrying on that high tradition in architecture for which England is justly famous, and I think we may congratulate ourselves in attaining a very high general standard at the present time; the public will not have the house which satisfied them a few years back, so even the speculating builder has to produce houses more consistent with the accepted canons of art than those he formerly flaunted in our architectural faces. In this connection I should advocate the assistance, but not the entire control, of the woman in architecture, for, in spite of the risk of bringing down on my head the wrath of the suffragettes, I feel sure that the wider architectural field is not one for which the woman is particularly adapted, but in domestic work she would be a very valuable ally. How can mere man expect to know the working of a house like a woman? Especially behind the scenes in the arrangement of the service and kitchen department; and very often in decoration we should many of us produce better work if we had the advantage of feminine assistance.

Another bone of contention which I feel bound to touch upon is that of registration. I myself am in favour of it; of course, no scheme of registration can elevate the art of architecture, but it seems to me that it certainly cannot do it any damage, and, incidentally, is sure to eliminate some of the undesirable, and might put us on a better recognised footing; but before we can be better we must be worse in such an all-embracing scheme as it must be to become law. Many self-styled architects must be included in the roll, but that is or should be the end of this class except so far as the public care to trust any unqualified man when they know that qualifications are essential. Before we can get satisfactory registration we must become a united body, and the advocates of the extreme views must moderate them; but one thing is quite certain, the movement cannot be rushed as one party at the moment seem to desire, as no Bill would stand a chance of becoming law if opposed by any considerable section of the same profession as the promoters; but I venture to think that the anti-registrationists are lessening in number, and I feel sure that they, being mostly in the forefront of the profession, will not stand in the way of a movement that so many think would improve our lot, although they themselves have succeeded in spite of the present position of affairs. There is, to my mind, one most essential factor, and that is loyalty to the central body—I

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mean the Institute. If this point was now generally realised the advantages to the profession would be immense; until nearly, if not all, architects belong to the Institute, the Institute in turn cannot put forward its views as those of the profession at large, and those architects in favour of the movement who refrain from supporting the central body are only weakening the cause of registration, and not advancing it.

There are here to-night a good number of students, some successful in this instance, and some who are going to be. Those who have carried off the awards I congratulate sincerely, but I would urge the others, some non-competitors and unsuccessful ones, to press forward none the less energetically because they cannot just now see their way to the top; remember that you are only on the lower rung of the ladder. Try again, or start to try, if lack of confidence in your own abilities has restrained you hitherto; the competition for the prizes has not been numerically strong of late, and you may find that you can do better than you think, and obtain honours here, to be repeated in the more important competitions at the Institute and again later in the field of life, where you may gain the highest honour of all—the appreciation of your fellow-workers, which nothing but the very best you are capable of will ever obtain for you.

I have often wondered lately if the brilliant draughtsmanship of the day, unless carefully guarded against by the student himself, may not have a derogatory influence on design; a too fluent pen or pencil is liable to run away with the happy possessor, though at times I admit he is wont to rise to far higher flights of fancy than the man less gifted in this way; but the product of the literary man's pen is his finished work, while the drawings of an architect are only means to an end, a step towards the building itself, and what looks well on paper, when drawn as well as some of you can draw, is liable to be misleading and less satisfactory in actual execution; therefore I would say, do not be satisfied with designing on paper without knowing the value in actual concrete form of the lines you put down, and the only way to know this is to take every opportunity of observing in actual work the value of different treatments, groupings or mouldings, and imagine how you would represent them on paper. I feel sure that most of our ideas, in some shape or form, have been thought out before, and in all probability executed, and are waiting somewhere for our approval or the reverse, to give us the advantage of modifying our ideas by the experience of those who have gone before.

The power of observation, when highly cultivated, is of inestimable value to us; a friend of mine remarking on it in this room once said, "I wonder how many of the men here know the number of panels in their front door?" I was the first victim, and for a short time afterwards I went about counting door panels as an exercise. I wonder how many of you are as ignorant as I was?

I noticed recently in one of our periodicals a short article on London as seen from the trams, of which I believe there are about four hundred miles, in which the author remarked what a good knowledge of our city could be obtained in this way, and what a valuable asset that knowledge would be; how true this is, and how little most of us know of this big city in which we live, when you consider that you can now ride on 'bus or tram, from east to west or north to south, over the one hundred and seventeen square miles covered with buildings in the Administrative County; you can imagine what a panorama of architecture and building is spread before you, an open book seldom read through; but study every page, good, bad, and indifferent, sum up and analyse every example before you, find out why a building strikes you as good; is it mass, colour, detail, or some fresh note in composition which has been struck? Consider even the works which do not impress you favourably; there is something good in most of them, or you may, at any rate, learn to avoid some pitfall that has been the undoing of a former essay, and above all, I would say, criticise kindly, look for the good in all and not the bad, hesitate to say to yourself how much better you would have done it. You never know the limitations, the troubles, the laws, the by-laws, the client's requirements with which the man who was responsible was hampered, and whether under similar circumstances your own work would have compared so favourably with it as you are inclined to think.

The difficulties that beset the path in actual practice, especially in large towns, are legion, quite apart from the matter of design, but these special requirements are increasing every day, and they must all be known to us before we can give of our best, for they will probably affect our designs very considerably; but if we strive earnestly to do the best that we can in every case, even though others at first seem too far ahead, in the end the earnest worker always gets his reward. One form of genius has been described as "an infinite capacity for taking pains," and the man of that type is never far from the winning-post at the end of the race.

Mr. Walter Cave, in proposing a vote of thanks to the President for his address, congratulated him on the honour of his election to the chair, which was thoroughly deserved. Few members had been more intimately connected with the working of the Association than Mr. Tanner, and he felt sure that the interests of that body would be furthered and strengthened during his term of office. The address they had heard was a masterly one, but he was struck by the reference in it to the question of finance. They were accustomed to think that the Association was more than paying its way from the fact, perhaps, that they had been able to get into the present building and pay off their debts. It was suggested that serious retrenchments would have to be made in the working expenses and an overhauling of their finances undertaken. He hoped that whatever was done those who would have charge of the overhauling of the finances would not feel it necessary to reduce the salaries and appointments of the teaching staff. Their teaching staff, he urged, must be of the very best, and whatever else had to go towards the reduction of expenses he hoped they would always be able to keep the most proficient teachers for their students. They were interested to hear of the progress of the various branches of the Association, and of the success of the Register of Assistants. He was more or less responsible for the suggestion that the Association should keep the register for its own members, and he was glad to hear the rearrangement had borne fruit.

Sir Aston Webb, R.A., said he wished to associate himself with the congratulations which Mr. Cave had offered to the President. He entirely agreed that so long an experience with the work of the Association marked the President out as just the man to occupy the chair. The President was very well known to him, as he had had the honour and pleasure of having him in his office for some time, and he only left it to better himself and ultimately to practise independently. It was suggested in the address that some of the ancient presidents should look back and make comparisons between the Association of their time and the present. Sir Aston Webb said he could speak of thirty years ago, when he was honorary secretary, and he could say that they did better now than then. He was amazed at the number of prizes distributed that evening. In connection with the prizes, he congratulated his old friend, Mr. Flint Clarkson, on the phenomenal success of his son during the year. Another familiar name among the prize-winners was that of E. W. Mountford, another Fellowes Prynne. It was pleasant to find how many sons were succeeding to their fathers' practice, and it looked as if architecture was not such a bad thing as some would have them believe. They all lamented the decrease in the membership of the Association, and particularly so when that decrease was caused through death. In other ways he did not think a decrease was altogether to be regretted. The different schools throughout the country induced a number of men to enter the profession who would have little chance of success, and since there was a lack of employment it was well that the number of students should diminish. As to women architects, he was not at all in favour of them, nor was he in favour of registration, but the latter was a question of politics which he would not touch upon that evening. Referring to the schools of the Association, he said he had been greatly interested in them for many years. He remembered when Mr. Seth-Smith suggested that they should have a day school, and the astonishment when it was successfully started. He was not in a position to speak for the Royal Academy, but he could say that the Royal Academy was desirous of working with the Association in the matter of their schools, and everything that could be done to bring those schools into co-ordination would be welcomed. He had been through all the offices of the Association and the Institute and the Royal Academy, and he could see the relative position that each of those bodies should hold. The position of the Association was for the elementary education, that of the Royal Academy for the final finish, and the Royal Institute as the sister of both by the examinations and prizes offered. He thought there should be a closer connection between the Royal Academy schools and the Association, and towards that end some forward movement might be made by the Association. In alluding to the "At Homes" it was proposed to hold during the coming session, he reminded them the Associa-

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tion was for young men, and he would be sorry if it became a second Institute; they had already imitated the senior body too much. Reference had been made in the address to steel-framed construction and the modern conditions of practice. The change was bound to come, and it was of the greatest importance, he said, that young men should face those facts and get in touch with the requirements as they arose.

Mr. W. H. Seth-Smith also alluded to modern scientific construction. In his opinion they would have to deal with the question in their schools, because far more science would have to be acquired by architects if they were to keep the work within their own professional ranks.

Mr. J. Osborne Smith supported the vote of thanks, which was passed by loud acclamation.

THE ASSOCIATION OF ENGINEERS-IN-CHARGE.*

(Concluded from last week.)

THOSE who have to carry out construction in brickwork know the difficulty that exists in bonding bricks of different quality, or from different sources, as although each group being made from the same size mould will not vary much, the different groups show considerable variation. A London brick averages 8⅞ inches by 4⅜ inches by 2⅝ inches, but a Midland or Northern brick will be approximately 9 inches by 4½ inches by 3 inches. The Royal Institute of British Architects, in consultation with the Brickmakers' Association and the Institution of Civil Engineers, framed conditions which came into force on May 1, 1904, fixing the average size of bricks and joints, which may be summed up as giving the standard size of the bricks as 9 inches by 4.375 inches by 2.6875 inches.

The use of co-ordinates in the production of curves is of extreme value in the case of any standard which consists of a series of values or dimensions. Numerals can only be grasped consecutively, but curves can be observed as a whole, and any irregularity is self-evident. So far back as 1860 I was using curves in this way, and have constantly adopted them for checking experiments and tests and tabulating proportions. The "uniformity of Nature" is a very definite fact, and there would be less irregularity in the records of tests if it were the general practice to plot them to curves.

Some years ago an elaborate series of experiments was made upon riveted joints, under the auspices of the Institution of Mechanical Engineers; but although I gave considerable time to their elucidation, I was not able to formulate them into any general standard for my own use. It is a subject that would well repay the trouble of casting into a popular form, so that given a material of standard quality one might know the best pitch and diameter of rivets for mere strength in girder and bridge work, and to resist fluid pressure in addition in boiler and tank work.

Eye-bars, or eyes for the ends of links, for bridges, roofs, cranes, &c., was another matter to which considerable attention was given some forty years ago, with the result that there were many suggested forms, but not one that could be called a general standard. We cannot say that mild steel represents finality in structural material, but it would be useful to have a standard form of eye-bar in this material.

Having been brought up as a mechanical engineer, I seem to drift generally to that aspect of any subject, but under the head of standardisation we have many branches to consider. I have only to mention the words "candle power" to call to your mind a standard that we have heard a very great deal about since the introduction of the electric light. The standard candle, or, as it is sometimes called, the British Parliamentary candle, is a sperm candle, six to the lb., ⅞ inch in diameter, and burning at the rate of 120 grains of spermaceti per hour. The "One-Candle Pentane Air-Gas Flame," invented by Dr. A. Vernon Harcourt, represents the true average value of the light of the legal standard sperm candle, but it is actually equivalent to 1.001 sperm candles. A similarly constructed ten-candle lamp was made permissible in 1898 for the official testing of London gas. The standard gas burner used for testing the illuminating power of all qualities of gas is the Sugg "London" (No. 1) argand burner, consuming gas at the rate of 5 cubic feet per hour, with a chimney 6 inches long and 1⅞ inches internal diameter. In France the standard illuminant is the Carcel lamp, burning 648 grains of pure oil per hour, and equal to about 7½ candles. The German (Hefner) standard candle-power is only 88 per cent. of the English standard; German lamps are, therefore, rated too high compared with English. The Hefner lamp was adopted in 1896 as the practical international unit measure of light.

Other countries besides our own have given much consideration to the question of a standard of light, and there are many difficulties still to be overcome: the latest information is from the Bureau of Standards in the United States. Mr. Nutting, of the Bureau, brings forward an entirely new standard in the light emitted by a body of glowing helium gas. Helium, it will be remembered, says the *Engineering Record*, is an extremely light gas which produces a well-known bright line in the yellow of the solar spectrum that puzzled the astronomers for many years. Found first terrestrially in mere spectroscopic traces in the gases occluded in certain specimens of lava, it was finally found in the rare mineral cleveite, isolated and examined, and has since been discovered to be an almost infinitesimal normal component of the atmosphere. One of its many peculiarities is that it glows when electrically excited at reduced pressure with an exceptionally bright yellowish-white colour, much nearer the hue of ordinary artificial illuminants than the colour given by any other permanent gas. It was next found that a capillary tube, say a couple of inches long and one-tenth of an inch in diameter, could readily be so excited as to give an extremely steady light of one or two candle-power per inch of length, and that the tubes could apparently be readily duplicated to give concordant results. Bringing the tube to standard condition means merely applying a definite and very easily measured electric current. The life of the helium tube is not yet determined, but there is reason to think that it can be made reasonably good, especially if it should prove feasible to make a capillary tube of quartz.

Here, then, one has a standard light which seems to be capable of ready reproduction, and which is of good colour and fairly satisfactory magnitude. With quartz tubes the available magnitude could probably be increased to 5 or 10 candle-power, which would be still better for the comparison of secondary standards. The light is entirely free from atmospheric conditions, and in steadiness leaves little to be desired. It is too early in the investigation to pass judgment on the true value of the helium tube as a standard; but it certainly looks very promising indeed, and is especially interesting on account of its novelty and simplicity.

The application of a standard of illuminating value to coal gas, although originated for that purpose, is felt to be somewhat of an anomaly, since incandescent mantles have been so widely adopted. It is the calorific value that is now the main consideration, and gas companies are consequently endeavouring to improve this by reducing the illuminating power. The South Metropolitan Gas Company, so far back as 1900, obtained permission to reduce their gas from 16 to 14 candle-power, and last year the Edinburgh and Leith Gas Commissioners reduced the candle-power of their gas from 20 to 14. It is probable that a combined test will ultimately be substituted as a standard for the present test of the candle-power of the naked flame.

James Watt, at the latter end of the eighteenth century, introduced the first standard for the rating of engines and machinery, viz., the horse-power of 33,000 foot-lbs. per minute. He knew that the actual power of a horse was about 22,000 foot-lbs. per minute, but he wanted his engines to be well ahead of their specification, so he allowed a 50 per cent. margin. The various kinds of horse-power that one hears about—indicated brake, nominal, actual, &c.—only refer to the mode of measuring or expressing it, and not to any intrinsic difference in the standard. Only two of them are really needed—the "indicated," which is the horse-power in the cylinder; and the "brake," which is the horse-power given out at the crank-shaft. In fact, it would be an advantage to use the term brake-horse-power alone as being the actual power the engine can give out. Nominal horse-power is a useless commercial term, which may mean anything, and should be entirely abolished. In passing I may say that James Watt missed a grand opportunity in not making the circular inch the standard upon which steam pressure should be measured.

Just now there seems to be some stir about the proper mode of standardising the power of small petrol motors. They cannot very well be "indicated," and various proposals have been made to establish a comparison by the dimensions. The Royal Automobile Club (1906) gave the rule for power rating as $\frac{2}{3} D^2 n$, where D is diameter of pistons in inches, and n the

* Inaugural address of the President, Mr. Henry Adams, M.Inst.C.E., M.I.Mech.E., F.S.I., F.R.San.I., &c., October 13.

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number of cylinders. H. Sturmey gave a horse-power formula as follows: $\frac{D^2SNR}{12500}$ where D is diameter and S stroke, N number of cylinders, and R revolutions per minute, to be taken as 1,000 if the actual number is unknown. This formula is practically the same as the ordinary horse-power formula for steam engines, assuming a mean pressure of 42 lbs. per square inch throughout the stroke.

Explosives are so largely used in certain engineering work that the need of standarising them has been suggested, and a start has been made by the American Society for Testing Materials. For some 500 years gunpowder only was at the command of the engineer, but since 1845 many other materials have been invented or discovered and used for blasting purposes. It is calculated that over 1,000 different explosives have been offered for use, and as their precise composition and mode of using are of vital importance, it is fit and proper that they should conform to certain standards.

The standardisation of catalogues has been talked about for many years, but makes little progress. The Architects' Technical Bureau are issuing to their members special covers and uniform sheets illustrating building materials and sundries supplied by the various manufacturers, but these are too much in the manner of displayed pictorial advertisements to be of real value. The Engineers' Standardised Publications Association appear to be doing similar work for engineers. The handiest sizes for catalogues and circulars are 8 inches by 5 inches, 10 inches by 8 inches, and 13 inches by 8 inches, corresponding with note, letter, and foolscap sizes of writing papers, but printed papers generally run a trifle larger.

Standardisation is not confined to engineering matters; the Quantity Surveyors' Association have commenced to standardise the modes of measurement for builders' quantities, and have issued No. 1 of their "Uniformity of Measurement" pamphlets, which deals with the measurement of slating and roof-tiling work; previously Leaning's book, entitled "Quantity Surveying," was the nearest approach to a standard that was available. There is every advantage upon the score of uniformity of procedure in producing such works, but the publication of a good text-book in any subject tends to standardise the work in that subject, and to some extent to cramp the minds of the students by giving the impression of finality. Although there are undoubted advantages in standardisation, it chiefly helps the average man, and aids economical production; while the man of intellect is more or less hampered by having a rigid model set up for him beyond which he may not pass. The whole tendency of modern education and official regulation is to make one man as much like another as possible, to stamp out individuality and to discount common sense. I have had not a little to do with technical education, and in a small way have attempted to stem the tide of the current reliability on rules and formulae. I have always advised students to try to understand the principles, and then the formulae would follow of their own accord without being a burden to the memory. My remark to a student on one occasion shows what I mean. He was troubled about a formula for some simple thing, and in remonstrating I said, "If you were in a stokehold when a gauge glass burst, you would want a formula to help you out of danger."

Reference may be made here to the proposal of standard notation for algebraic formulae, which was taken up by the Civil and Mechanical Engineers' Society, and a discussion opened by the President, Mr. W. Noble Twelvetrees, on January 2, 1908. The same subject was considered by the International Commission on Reinforced Concrete at Bâle on October 12, 1908, and a resolution was proposed that "a uniform mathematical notation for the most important magnitudes occurring in the specifications and statical computations should be drawn up," and early in 1909 an interim report was issued, which was a distinct step in advance, but the result was somewhat crude. The Concrete Institute took up the matter at this stage, and after several meetings of the Science Standard Committee and Special Sub-Committee on Notation, of both of which I was a member, a draft report was prepared which is published in the Concrete Institute *Transactions*, Vol. I., Part III. Although all members of the sub-committee were assiduous in their labours, the chief credit must be given to Mr. E. Fiander Etchells, who was most enthusiastic. Briefly, the proposed notation is based upon what is called the "three-alphabet system," in which initial letters in "Latin smalls" are used for lineal dimensions, intensities of forces, loads and stresses, constants, &c.; in "Latin capitals" for areas and volumes, moments, total forces, loads and stresses, angles, constants, &c.; and in "Greek smalls" for angles, constants, &c. The reduction of half a dozen of the best-known but apparently dissimilar ferro-concrete formulae to the standard notation causes all their differences to disappear, and there is no doubt that much advantage would accrue from the general use of the same letters to represent the same things.

Recently I have been assisting the London County Council in framing and passing their Building Act amendments through Parliament, to permit of steel frame construction and reinforced concrete buildings being erected without the hampering restrictions imposed by the 1894 Act, and I am reminded that this is only another form of standardisation. If architecture and engineering had been close professions like law and medicine there would be little need for Building Acts, as only competent persons would be registered, while such Acts now have to be framed to regulate the incompetent designers and keep them within safe limits.

By a little expansion of the idea it may be said that the laws by which the country is ruled are only standardisation applied to actions; but, gentlemen, we must not get into politics, and I think I have occupied sufficient of your time if I have not been able to give you much instruction. I trust, however, that I have been able to arouse a little interest in the subject which may lead you to give it further consideration.

THE RATING AND TESTING OF BOILERS FOR HEATING INSTALLATIONS.*

(*Concluded from page* 237.)

Chimney.—The function of the chimney is to aspirate a sufficient but not excessive quantity of air through the incandescent fuel in order to maintain the combustion of the required quantity of fuel per hour. I have often thought that the use of the draught gauge is imperfectly understood by many of those engaged in this business. A hot flue which is freely open at the top and bottom will show no draught on a water gauge, although a strong current of air is passing up it. On the other hand, a hot chimney which is open at the top and completely closed at the bottom will show a "draught" depending only on the height of the chimney and its temperature. The height of the chimney and the difference of internal and external temperature produce what may be called the total "aeromotive force" of the chimney. This is the value of the suction—generally expressed in inches of water—which would be produced at the base of the chimney when there is no actual current of air passing up it, that is, when the bottom damper is completely closed, and when the temperature of the chimney is the same as in actual practice—generally about 500 deg. The aeromotive force depends only on the height and temperature difference, and not at all on the sectional area or resistance in the chimney. When a certain number of cubic feet of air per hour are passed up that chimney, the temperature being still maintained, the suction indicated on the gauge decreases, that is, a certain proportion of the total aeromotive force is dissipated by the friction of the air in the chimney, the amount depending on the sectional area or resistance of the chimney, and the more air there is allowed to pass, the more of the total aeromotive force is dissipated, until when the bottom damper is freely open, the dissipation of the aeromotive force is complete, and the chimney passes its maximum quantity of gas without forced draught, and the draught gauge shows no "suction" whatever.

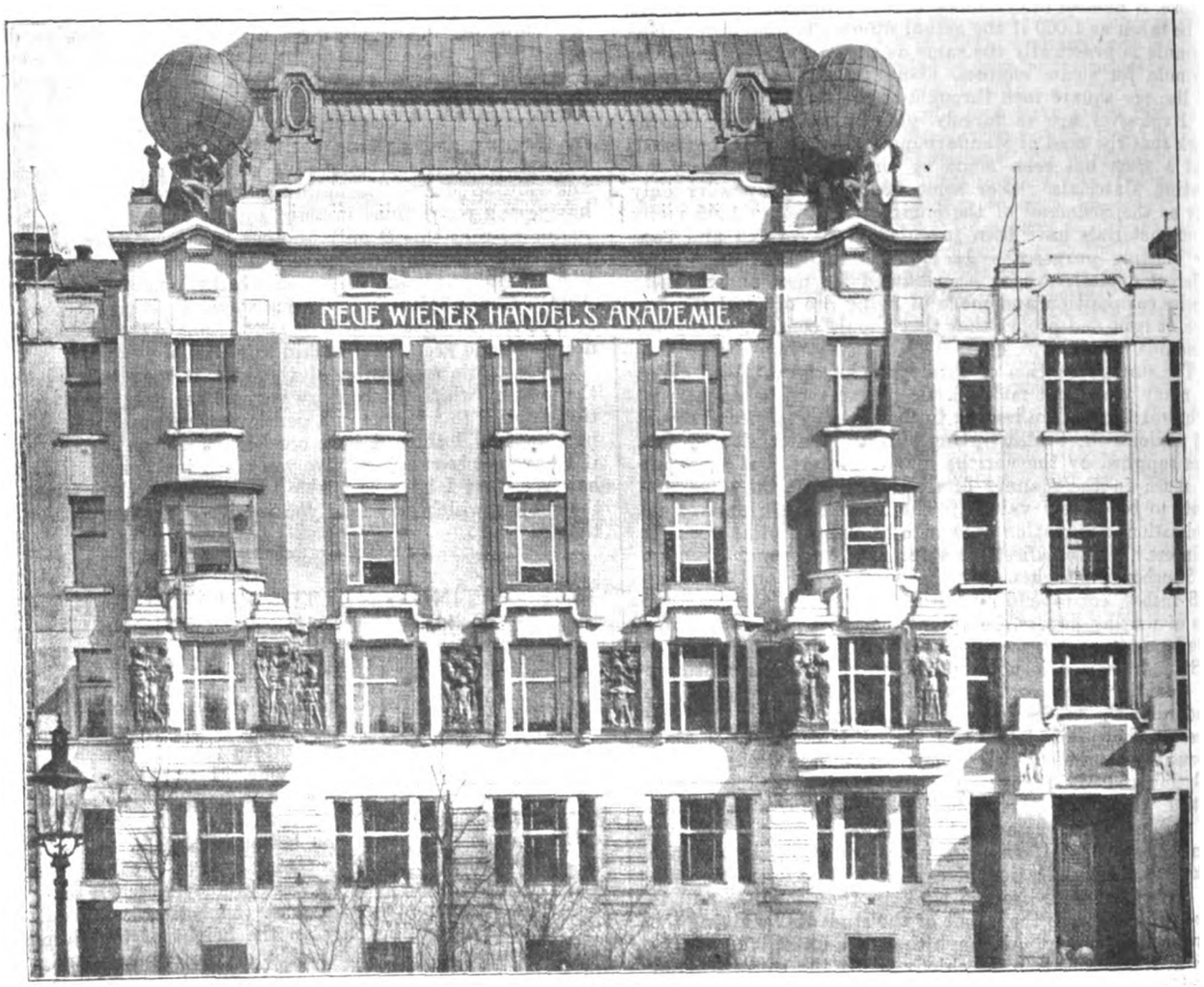
When this chimney is drawing air through a boiler filled with incandescent fuel, some of the total aeromotive force is dissipated in the flues of the boiler itself by friction. When the quantity of air passing is sufficient to provide for the maximum power of the boiler, the difference between the water gauge suction below the firebars and that at the outlet of the boiler flues leading into the chimney on the boiler side of the damper, measures the resistance of the boiler, that is the amount of pressure necessary to force the maximum required quantity of air through the incandescent fuel and flues of the boiler. This resistance varies not only with the boiler design, but also with the kind of fuel used, the quantity on the furnace at one time, and the amount of dust and ashes which have accumulated on the grate bars, and other matters.

The total aeromotive force of the chimney must be such

* Abstract of a paper by A. H. Barker, read before the Institution of Heating and Ventilating Engineers at Manchester.

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MODERN EUROPEAN ARCHITECTURE.
AUSTRIA.



NEW VIENNA TRADE SCHOOL. [From *Der Architekt.*
Professor Julius Deininger and Wunibald Deininger, Architects.

that at all times and in all circumstances it will be sufficient to provide not only for overcoming the resistance of the chimney itself, when passing such a quantity of products of combustion as will be given off from a grate consuming the required weight of fuel per hour, but will also provide a surplus of pressure to overcome the resistance of the boiler when fully charged with fuel for a long run, and when the grate bars have accumulated a moderate quantity of ashes.

This is the real criterion of adequacy of a chimney. Many engineers are satisfied with their inspection of a chimney if it "pulls," but the real question is, does it pull when it is passing the proper quantity of flue gases, and does it pull hard enough to draw that air through a dirty fire? If it does not, the caretaker will have to be continually cleaning the fire so as to keep the internal resistance of the boiler down, and if it pulls too hard, he will have to be continually adjusting the damper to prevent damage to the fire-grate when the fire is clean. This cannot be prevented by an automatic regulator. It is quite possible to burn firebars out when the water in the boiler is nearly cold.

If there is an excess of chimney power, it is imperative for safety to have an adjustable fixed damper, which can be set once for all so as to be not under control of the attendant. If this is not provided, a bad attendant may mean a destroyed fire-grate. In any event, care will have to be taken that there is never too great a variation in internal resistance of the boiler, otherwise a draught which would be insufficient when the fire is dirty might be enough to destroy the fire-grate when it was clean.

Different boilers vary very much in internal resistance when clean. There are boilers which require as much as $\frac{1}{8}$ inch to $\frac{1}{2}$ inch of pull to draw sufficient air through the furnace to maintain complete combustion. Other boilers do not require more than 1/32 inch. It is evident that a chimney which is quite adequate for the latter might be totally inadequate for the former, so that it is clear that no experimental comparison of two boilers can be made merely by substituting one for the other in the same situation.

But chimneys are generally recommended which are considerably in excess of actual requirements so that a high resistance boiler can generally be used with them. But it is clear that a low resistance boiler runs more danger of burning the fire-grate than does a high resistance one, because the difference in resistance due to a dirty fire bears a greater proportion to the total.

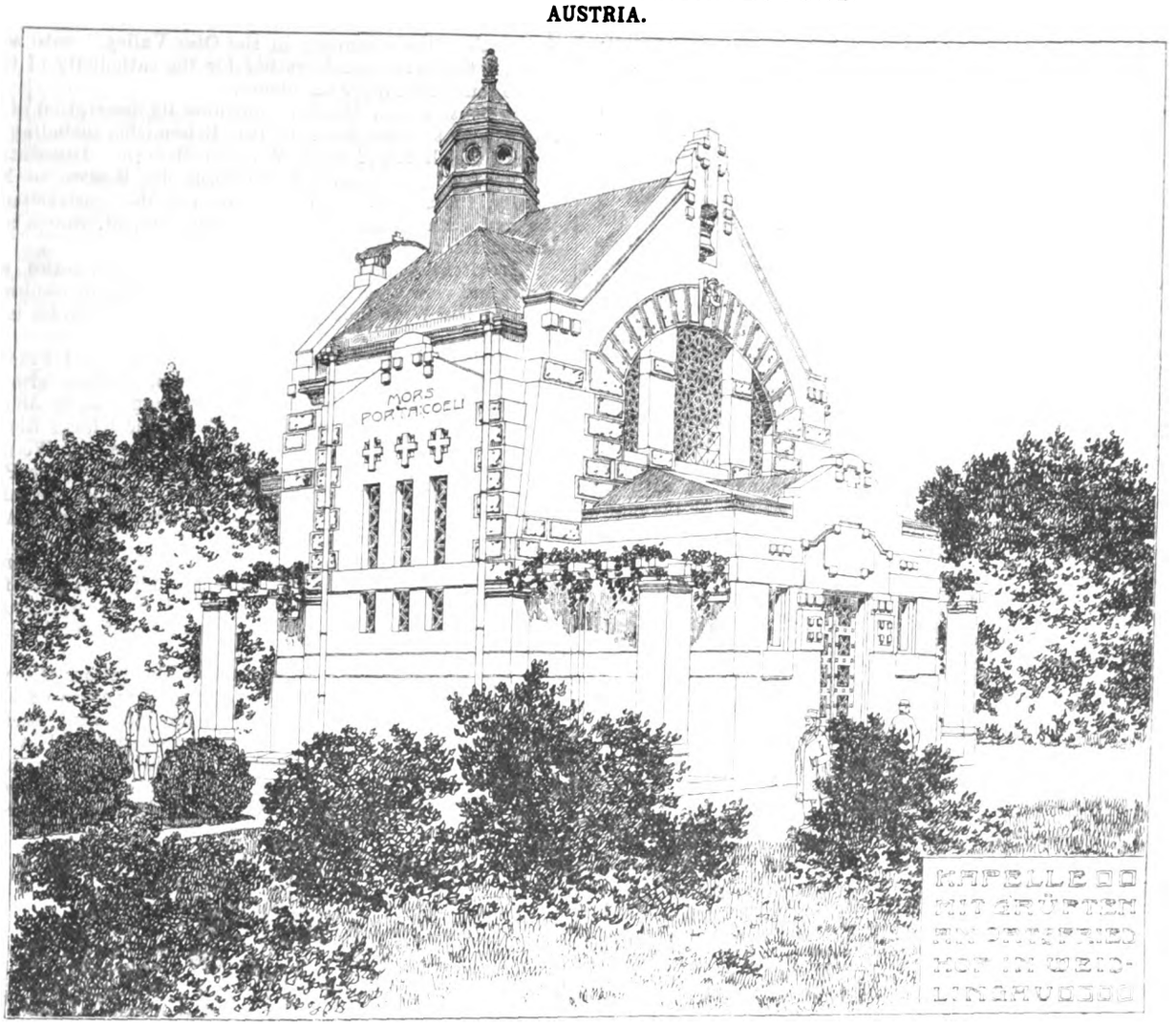
Area of Fire-Grate.—A great deal of what I venture to consider unnecessary attention has been devoted to the question of the area of the fire-grate. According to my view, this should be determined from many other considerations besides the power of the boiler. My own opinion is that what should determine the area of the fire-grate is, first, the number of pounds of fuel which can be burnt on it without damaging the bars; secondly, how long a charge of fuel is to be left on it without requiring the fire to be cleaned. If you can actually and completely burn on it all the fuel you require without damage and without requiring an inordinate amount of cleaning, the area of your grate matters not at all. If the firebars are water cooled, and the draught is adequate, it is easy to get an enormously high rate of combustion per square foot of fire-grate without detriment, unless the quality of fuel used is such as to choke up the bars, and thereby increase too much the internal resistance of the boiler.

Quantity of Fuel Burnt.—One of the main things to be determined in finding the power of the boiler irrespective of economy in fuel, is the amount of fuel which can be burnt in the fire-grate without damaging the fire bars. The maximum power of a boiler depends on the maximum quantity of fuel which can be burnt in the grate. To fix our ideas, let us take a boiler which would be fairly rated at 1,000 square

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AUSTRIA.



MAUSOLEUM AT WEIDLINGAU. [From *Der Architekt.*
MAX HEGELE, Architect.

feet of surface; such a boiler would probably have from 40 to 50 square feet of heating surface. Now suppose there is unlimited draught at command, and that it can be arranged to burn as much or as little fuel on the furnace as required. Suppose five pounds per hour are burnt in such a boiler. This liberates say 65,000 B.T.U., of which one might reasonably expect to transfer to the water, say 60 per cent. or 40,000 B.T.U. per hour. Such a fire would maintain in the radiators a temperature of say about 90 deg. F.

By adjusting and increasing the draught, you might arrange to burn successively say 10 lb., 15 lb., 20 lb., 25 lb., 30 lb. per hour, and so on until you arrive at such a point that the intense heat of combustion damages the fire-grate, or perhaps the internal resistance of the boiler to passage of air would be such that without having a great and utterly impracticable draught, it would be impossible to get sufficient air through the boiler to burn any more fuel. Whenever any of these conditions become such as to be impracticable in ordinary use, it is an indication that the boiler is unequal to burning that quantity of fuel per hour, and you have thereby fixed a limit of power of the boiler which it is impossible to exceed. But so long as you can increase the temperature of the products of combustion in a boiler by burning more and more fuel, so long is it possible to increase the number of B.T.U. which can be transferred to the boiler water. The difficulty of determining the exact maximum point is obvious, indeed it cannot be determined to within 25 or 50 per cent. But even if it were determined we should be as far as ever from a determination of the practical limit. In order to determine the latter, we must enquire into the requirements of the customer or user of the boiler. If a furnace is burning at its maximum rate, everybody knows that in practice the fire will soon either clinker or choke up or burn through, or something will happen to diminish the effect; that is, in order to maintain this rate of combustion the attendant must be continually tinkering with the fire. If he does not the heat will go down. It appears necessary, therefore, to fix a time during which the fire must maintain the heat of the boiler without being attended to. During the earlier part of this period the temperature will be greater, and during the latter part it will be less. A very perfect automatic regulator, combined with a very powerful available draught, might maintain the temperature almost constant in practice, but if it did, the boiler during the earlier part of the time would be working much below its maximum capacity. The shorter the time fixed, the higher will be the power of the boiler, and *vice versa*, so that in specifying the power of a boiler for practical use one must fix the time during which the boiler is to be left unattended, otherwise the expression "maximum power" has no meaning. This is, of course, intimately connected with the fuel capacity of the firebox, but not solely. Some boilers can be filled up with fuel, and, if left unattended for some hours, the fire will burn down and grow cold, even though there is a good deal of unconsumed fuel in the furnace. In order to restore the temperature, the fire has to be cleaned. This is more so with some fuels than with others, so that it seems to me to be impossible to specify the exact power of the boiler without reference to the kind of fuel used.

Economy.—The question of economy is quite a separate matter. Generally speaking, as the consumption goes up, the economy goes down. The less fuel burnt per hour above a certain limit, the greater the proportion of the total heat generated is transferred to the water. The existence of a lower limit is due to the fact that if you are burning so little fuel that in order to burn it at all you must have an excess of air, the temperature of the products of combustion is reduced after leaving the incandescent fuel, and the economy goes down. It follows then that for every boiler there is a

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point of maximum efficiency, in other words a point where the fuel is most efficiently utilised. Now, in my view, no test of a boiler is of much scientific, nor even of much practical value, unless it takes into account both these matters.

One must know what is the effect of a prolonged run at different rates of combustion, and one must also know which is the point of maximum economy, and the relation between the economy at the maximum and at other rates.

I do not think a complete test of any boiler could possibly be made in less than one week—that is, the boiler would be worked at constant powers for each particular day, the power being decreased on successive days. Observations would be kept throughout each day. Now a heating engineer who was provided with tests of a boiler such as these would know exactly where he was. He could tell at once whether his boiler would do the work expected of it, and if having installed the boiler, he found it was not up to the work expected of it, he could tell with certainty whether the deficiency was due to poor circulation, bad fuel, poor draught, bad attention, or defective power in his boiler. His draught gauge would indicate whether the chimney pull was sufficient, or whether the fuel was inferior. He could measure the weight of fuel consumed during a day and compare it with the test result, and know at what point he was getting the maximum efficiency out of his boiler. Such tests would be of the greatest possible assistance to the maker, affording him an absolute indication as to improvements in design, and would give a great fillip to the art of boiler design, and would doubtless result in the evolution of a standard type of boiler and the elimination of the unfit. The thermal efficiency of the boiler is, of course, not the only consideration, and boilers of inferior thermal efficiency might, and doubtless would, hold their own in the market on the ground of superior convenience, strength, or other qualities not directly connected with the thermal efficiency.

For catalogue purposes it would be very difficult indeed to indicate the results of these tests without considerable elaboration, and I am not sure whether it could with advantage be done in an ordinary commercial catalogue.

Conditions for Uniformity of Result.—In order that the tests may be strictly comparable with one another, it would be necessary that they should all be obtained with constant conditions. The conditions that affect the result are the temperature and velocity of the water circulating in the boiler, and the quality of the fuel used. All these remarks refer to water boilers. I am strongly of the opinion that a test of a water boiler made by measuring the amount of steam it can generate is wholly unsatisfactory, because such a test does not and cannot give the same result as would be obtained with a water circulation. The circulation through the boiler should be at approximately the same velocity as obtains in practice and the temperatures of the water should be similar. These conditions can only be secured by a natural circulation, in which the difference in temperature between the flow and return pipes is artificially kept constant. In testing the same boiler at different powers, regulation of power should be obtained by maintaining at a constant rate the flow of water through the boiler, and varying the temperature of delivery by controlling the combustion, but for any one day's test the temperature should be kept the same throughout the whole of the run. The temperature difference between flow and return should be less as the flow temperature decreases, in accordance with the principle that radiators lose more heat at a higher temperature.

The character of the fuel employed—preferably coke—must be similar to what is employed in actual practice, neither exceptionally good nor exceptionally bad, and a large quantity of it should be accumulated so that the quality may be as uniform as possible throughout a large number of tests. A large number of samples of it should be tested with a calorimeter.

The boiler itself should be installed so as to be under the same conditions as in practice, and the conditions must be such as to enable the heat given off to be measured within, say, 5%. I have not the least doubt that the tests, if carefully made, would be capable of being reproduced, so that one could not obtain two different results when the conditions were the same.

Mr. James Miller, A.R.S.A., architect, Glasgow, has been instructed by the directors of the City and County of Perth Royal Infirmary to prepare plans and specifications for the erection of the new Infirmary at Western Avenue, Tullylumb, Glasgow Road. The infirmary is to contain 120 beds, and the estimated cost is 36,800*l*.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* has a chatty account of an architect's "little journey in the Oise Valley," with some sketches that are notable rather for the catholicity of taste of the tourist than for excellence.

La Construction Moderne continues its description of old Paris, with sketches from the Rue Brisemiche, including the apse of the church of Saint-Merry or Médéric. Illustrations are given of the chapel of the Ecole des Roches, in Normandy, the salient feature of which is the construction of the roof with laminated ribs, without ties, M. Storez being the architect.

Architekten und Baumeister Zeitung illustrates with plans and view a characteristic Viennese block of residential flats in the Widerhofergasse, of which Rudolf Erdös is the architect.

Deutsche Bauzeitung continues the account of Frankish architecture by Professor F. Ehemann, dealing with the Renaissance work of 1539-1650, and accompanied by illustrations of the Royal Schloss at Würzburg, the Kloster Ebrach, the Schloss Pommersfelden and the Schloss von Werneck. A description, with illustrations, is also given of the Prussian Legation at Munich, with which is combined the gallery containing the collection of modern pictures made by Adolf Friedrich, Graf von Schack.

Moderne Bauformen is chiefly occupied with an extensive and varied series of domestic work, including examples from Copenhagen and from many different parts of Germany. There are some pleasing coloured sketches of interior treatment.

Der Profanbau has some excellent illustrations of the new Charlottenburg Bridge at Berlin, a very fine piece of work designed by Professor Schaede. An interesting study is a combined infants' school and housewifery school at Bielschowitz. An illustrated article by Friedrich Müller traces the development of smithcraft from the eleventh and twelfth centuries to the latest "new art" mode as exemplified in the Berlin underground railway.

Correspondence.

[*The Editor will not be responsible for the opinions expressed by Correspondents.*]

Employment Register.

Sir,—Some time ago an Employment Register was instituted by this Society for the use of professional engineers seeking employment, and in view of the utility of such an organisation it is hoped that you will render any assistance in your power in giving publicity to the particulars stated below. Where a vacancy is advertised the employer is immediately inundated with hundreds of applications, the examination of which involves considerable extra work and loss of time (to say nothing of temper), but the use of this Register goes far to solve the difficulty of selection from among a large number of applicants personally unknown to the advertiser.

The principal features of the Register are as follows:—

1. No fees of any kind are charged, the cost of management being defrayed by the Society with a view to the ultimate benefit of the profession.

2. Qualified engineers of all grades may have their names recorded, though in making a selection from a number of equally suitable men, preference is naturally given to members of the Society, for whom the register was originally instituted.

3. Only a few names of probably suitable candidates are put forward for each vacancy so as to facilitate the employer's choice as much as possible.

4. Every effort is made to get personal knowledge of candidates, together with full details of their qualifications, before sending in their names.

A number of well-qualified men, representing the various branches of engineering work, are now available, and it is thought that if the register were better known it would be widely used and appreciated by all who require draughtsmen, inspectors, and other classes of assistants.

Employers are invited to send inquiries by telephone or in writing to the Secretary, stating their requirements as regards age, qualifications, salary, &c.

A. S. E. Ackermann.

Society of Engineers, 17 Victoria Street, Westminster, S.W.: October 18, 1909.

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The Architect.

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FORTHCOMING EVENTS.

Monday, November 1.

Royal Institute of British Architects: President's Opening Address. Presentation of the Royal Gold Medal to Dr. Arthur Evans, F.R.S. Address by Dr. Evans on "Recent Discoveries in Crete."

Liverpool Architectural Society: Paper on "The Elements of Design in Internal Decoration," by Mr. T. R. Spence.

Tuesday, November 2.

Institution of Civil Engineers. Address by the President, Mr. James C. Inglis. Presentation of Council's awards and reception.

Wednesday, November 3.

Royal Archæological Institute: General Meeting.

Institute of Sanitary Engineers: Paper on "Oriental Sanitary Engineering," by Mr. C. T. Evennette.

Thursday, November 4.

Paint and Varnish Society: Paper on "Painting on Stucco," by Mr. Furniss.

Friday, November 5.

Architectural Association: A paper on "Drainage and Sewage Disposal," by Mr. W. D. Scott-Moncrieff.

SELBY ABBEY.

THE magnificent abbey church of Selby, which was re-opened on Tuesday in last week, after the restoration necessitated by the great fire in October 1906, three years ago, has an interesting history, as well as an exceptional charm as one of the most beautiful of the great monastic churches of England.

Founded in 1069 by BENEDICT of Auxerre "in honour of Our LORD JESUS CHRIST and of His most blessed Mother the VIRGIN MARY, and of ST. GERMAIN of Auxerre," it was in the time of his successor, HUGH DE LACY, that the foundations of the present building were first laid. Of the work of this abbot, the most powerful, distinguished, and pious of the long roll of those who ruled at Selby, there now remain the western wall of the north transept, a part of the north wall of the same, the lower part of the tower, the fragment of the south transept, the easternmost bay of the nave, and the two turrets flanking the north transept.

It has been suggested, and seems highly probable, that FLAMBARD'S work in the nave of Durham and HUGH'S work at Selby were the design of the same architect. In both there are peculiar and similar details, in both the alternation of circular column and clustered pier, the latter with vaulting shaft, suggesting an intended, but never accomplished, method of vaulting the nave somewhat in the German Romanesque manner, with two bays of the nave arcade comprised in one bay of the main vault.

Between 1140 and 1180, in the Transitional period, were erected the north triforium, the north porch, and the west end of the nave. Of this work the north triforium and the north porch are especially remarkable as among some of the best work of the period that we have in England, and well exemplify the influence of the Cistercians on the development of English Gothic, even though Selby was not of their order, but Benedictine.

The Early English work includes the south triforium, the clerestory of the nave, and the upper part of the west end of the nave, all of which were completed by the year 1221. The gable of the west front, it should be noted, was erected in 1873, from the design of Sir GEORGE GILBERT SCOTT.

It was not till about the year 1280 that the present choir of Selby was begun, and to this fact we owe the manifestation of one of the finest examples we possess of the Decorated period in its full fruition. During this epoch, between 1280 and 1360, there were inserted traceried windows in the aisles of the nave and clerestory windows on the west side of the north transept.

Completing the value of Selby as an historical guide-book to the development of English Gothic architecture, we have as contributions of the Perpendicular period, between 1400 and 1540, the great window in the north transept, the Latham Chapel, the sedilia, the west window, and the arch at the east end of the north aisle of the nave.

Selby, on the dissolution of the monasteries, was finally surrendered to the King in 1539, and in 1618 was made "parochial" by letters patent of JAMES I. Its revenues, diminished as they had been during the latter part of its existence as a monastery, having thus been lost, dilapidations followed, and in March 1690 the upper part of the tower fell, carrying with it the south transept, the vaulting of the adjoining bay of the choir, and a portion of the south choir aisle. The restoration of the south transept still remains to be carried out, and it is to be hoped that the necessary funds may soon be contributed, so that what has been so well and quickly done to efface the dire catastrophe of three years ago may be supplemented by a restoration of Selby Abbey to its complete design.

Although in its best days a Benedictine abbey of high importance and great wealth, the whole of the domestic buildings, together with the cloisters, which were on the south of the nave, have disappeared.

The nave, which suffered less than the rest of the Abbey, was re-opened on October 19, 1907, one year after the fire. It was temporarily fitted for service and has been in full use since that date.

Two years more have been required for the completion of the restoration and for the addition of the upper stage of the central tower. It has now been found possible to raise the tower to the height it had been in the fourteenth century, but, as we have already said, the south transept is still missing, and its absence detracts very much from the beauty of the exterior.

Before the tower was undertaken, very extensive underbuilding was necessary, as the Norman foundations were quite insufficient, and had to be replaced with new ones going down to the solid soil below.

The design of the tower has been based on old drawings, which, however, differ a good deal, so that only an approximation to the ancient design has been possible. The effect is certainly striking, and it harmonises well with the rest of the building, and especially with the choir, the style of which has been followed. The effect of the fire on the eastern part of the Abbey was deplorable. All the roofs were completely destroyed, as well as the stalls, organ, reredos, screens and all other fittings. Nothing remained but the bare stonework, and this was so much injured that unless powerful wooden supports had been erected at once, the beautiful choir must have collapsed. Many months were occupied with the repairs to the stone columns and arches of the choir and south transept. This has all now been accomplished. Great quantities of new stone of a similar kind to the old have been inserted; the mouldings of the arches and other features have all been

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made good; underpinning has been done where it proved to be necessary, and strength has been supplied where it was wanted. The building has now far more stability than at any previous time, for the original weakness of the Norman foundations, from which the Abbey had always suffered, has been remedied and the various defects which this had led to have been made good. It was in the tower and the transept that the most serious weakness was found, and a great amount of work was necessary. All this has now been done in the most satisfactory way, and the greatest credit is due to the contractor, Mr. Ullathorne, and to Mr. Searle, the clerk of the works.

Turning now to the injury done by the fire to the roofs of the Abbey, it has to be pointed out that the choir has always been ceiled with oak groining of very beautiful design. It would appear that the first intention of the fourteenth-century builders was to cover it with stone groining. Some preparations were made by preparing for flying buttresses in two places, but the idea was abandoned and the design of the groining was carried out in oak.

This beautiful work was entirely destroyed by the fire, but happily it has been possible to reproduce it with great accuracy. The carved bosses were a notable feature, and these have for the most part been reproduced from some excellent photographs which were taken some years ago. The north transept and the adjoining Latham Chapel had finely panelled ceilings dating from the fifteenth century. These were completely destroyed, but it has been possible to recover their designs from drawings which existed. In the tower the panelled ceiling as well as the floors above and the roof were all reduced to ashes, and at the same time the fine peal of bells and the clock perished. All these losses have now been made good, the bells, increased in number from eight to ten, having been hung at a higher level in the new belfry stage.

The roofs of the choir aisles escaped destruction, as was also the case with the nave aisles, these parts of the Abbey having stone groining, which prevented the fire from reaching the woodwork. All the roofs were covered with lead, and this, of course, perished with the timber; but it is satisfactory to note that nearly 1,200*l.* worth of lead was recovered from the *débris*. All the lead covering has now been reinstated, so that the external appearance is almost exactly the same as before the fire, the only exception being that it has been thought best to add a high-pitched roof to the north transept, as indicated by the weathering on the tower. The exterior of this transept was not satisfactory, and it is generally felt that the alteration of the roof and the completion of the gable and its pinnacles has effected a very great improvement in this part of the Abbey. Internally the fine panelled ceiling has been retained.

Turning now to the interior of the Abbey, the destruction caused by the fire was absolutely complete. Hardly the smallest vestige of any of the fine woodwork of the choir remained. The stalls, the elbowed seats of which were in part ancient and of very remarkable design, were entirely destroyed. The whole of the screenwork filling the side arches of the choir perished, no trace of the organ remained, while the reredos, altar, altar rails, pulpit and the celebrated wooden aumbries all shared the same sad fate, and were reduced to heaps of charcoal. Four of the side screens were ancient and of unique design, while the aumbries which occupied the north side of the sanctuary were of the greatest interest, nothing like them existing in any other church.

Happily it has been possible to reproduce all the ancient woodwork with great exactness; various drawings and measurements existed, several of great value having been lent by the kindness of architects. In this way and by the help of photographs the ancient design of the elbowed stalls, the sanctuary screens, and especially of the old aumbries, has been recovered, and their reproduction may be regarded as absolutely correct.

One ancient screen at the west end of the north choir aisle was not altogether destroyed, its western side being to a large extent saved. This has been carefully restored and the missing features supplied from drawings and photographs. The remainder of the choir woodwork only dated from the restoration in 1890, and was designed by Mr. Oldrid Scott. All this has now been replaced, but owing to the liberality of the ladies' committee and others it has been possible in every case to improve on the former design and to make the new fittings as far as may be worthy of this noble building. There have been notable additions to the woodwork, especially a choir screen and the cases of the double organ, which now occupies the western arches of the choir. The choir screen is lofty and very open, and its details are extremely rich and finely carved. This is the work of Mr. Bridgeman, who has also executed the framework of the reredos, the pulpit, the Bishop's chair and the Litany desk.

The stalls, the canopied screens behind them and the organ cases have been made by Messrs. Thompson of Peterborough, while the reproduction of the ancient sanctuary screens, those enclosing the Latham Chapel and the aumbries are the work of Mr. Ullathorne of Selby. All this woodwork is of the highest order of workmanship and reflects the greatest credit on the various firms who have so admirably carried out the architect's designs. The sculpture in the reredos, representing the Crucifixion and other subjects, has been executed in Ober Ammergau, and is a fine example of the work of Herr Peter Rendl, the talented sculptor of that place.

The choir has been paved with marble, the old paving having been too much injured to be retained. This work has been done by Garston Freres, a Belgian firm, one of the partners, Mr. W. Wrathall, being connected with Selby.

The restoration of the ancient stone carving, as well as all the new carving in the tower and elsewhere, has been admirably done by Mr. J. Baker, of Ravensdon Street, Kennington.

The wrought-iron altar rails are the work of Mr. Clarke of Brackley, while the choir gates have been made by Mr. Norkett of Maidenhead. Bells by Taylor of Loughborough, and clock by Smith & Sons of Derby.

A morning chapel has been formed at the east end of the north choir aisle. Here is another screen (making fourteen in all), while the altar is a careful reproduction of a fine old Jacobean table which was destroyed by the fire, and the altar rails are founded on the design of the old Classic ones which formerly belonged to the choir.

The grand old stained glass in the east window was terribly injured by the fire, but it has been admirably restored by Messrs. Ward & Hughes, who had previously in the early 'seventies been employed by Mr. William Liversidge to complete its ancient design.

Such are the works which have been carried out in restoring the grand old Abbey to the condition it was in before the fire. Infinite pains have been taken by the architect and all connected with the work to reproduce faithfully each ancient feature and to make every part of the work worthy of the beautiful Abbey which is the pride not only of Selby but of all Yorkshire.

Our slight sketch of the history of Selby and of the work of its latest restoration are derived from a most interesting brochure* by Mr. Charles H. Moody, excellently illustrated by photographs and by beautiful pen and ink drawings by Mr. E. Ridsdale Tate; and from a description by Mr. J. Oldrid Scott, F.S.A., the architect of the restoration.

Another of the panels in the banqueting-room of the Edinburgh Council Chambers has been filled up by the placing in position of the picture gifted by the High Constables of Edinburgh. It is, like the others, painted by William Hole, R.S.A. The scene is the dinner party at Holyrood prior to the Young Pretender's departure for England. The panel is one of four smaller ones above the doors of the room. The other three are in Mr. Hole's hands—the subject of two of them is Queen Mary.

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* *Selby Abbey, a Résumé*, A.D. 1069 1908. By Ch. H. Moody, Organist of Ripon Minster, with illustrations by E. Ridsdale Tate. London: Elliot Stock. 1s. net.)

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NOTES AND COMMENTS.

Mr. W. D. Caröe, in the *Church Builder*, runs a tilt against "the most destructive of Nature's aids to the picturesque," "the ivy bough," and counsels its ruthless destruction and imperative removal. He especially emphasises its destructive activity in the neighbourhood of water-pipes. There are differences of opinion as to whether ivy does or does not tend to make a wall damp, but there can be little doubt that it is an active cause of the rapid development of incipient weakness in all walls, whether of stone or brick.

It is rather amusing to read in the report of the meeting of the Court of Common Council of the City of London the various opinions expressed by architect members of the Court on the proposal brought forward by the City Lands Committee to reinstate Dance's front. But nobody seemed to have had the courage to advocate outright the only sensible alternative, to pull down the remainder of Dance's work and put something else in its place. Now that the matter has come up for consideration, it can scarcely be left as Sir Horace Jones left it. Granted that Dance's work is bad Gothic, surely this is no argument for leaving part of it, for keeping the front of the Guildhall of the great City of London in the guise of a pig with one ear. The pig may not be beautiful, but he would certainly look better with his symmetry complete as he first appeared.

We are glad to know that the appeal that has been made for further sums for the repair of Hexham Abbey, and for paying the architect for what he has already done, has met with the response of a donation of one hundred guineas as a start. We are also gratified to learn that Canon Savage, the rector of Hexham, contemplates the establishment of a Fabric Fund for the maintenance in repair of the building when the "restoration" is completed. Our national monuments should never need "restoration," they should be kept in repair by immediate and frequent attention to each and every small defect that arises. It is only the neglect of the custodians of old buildings that renders "restoration" necessary and urgent appeals for funds imperative.

From the Presidential address of Professor Amoyl, Dean of the Faculty of Arts in the University College, Aberystwith, to the members of the Birmingham Welsh Society we learn that there are in Wales no certain traces of the existence of palæolithic man, although there are many of the neolithic inhabitants, and still more of the bronze and early iron age. The bronze age appears to have commenced in Wales about 1500 B.C., and was succeeded by the earlier iron age about 200 or 250 B.C. From the character of the remains of the bronze age Professor Amoyl deduces that Brythonic-speaking tribes of Celts settled in Wales from Gaul about 400 B.C., and were followed by a considerable influx of these tribes towards the first century B.C.

Liverpool proposes to spend 225,500*l.* on an improvement scheme for the Housing of the Working Classes, but estimates that this will only require a rate of ½*d.* in the pound, for which accommodation is to be provided for 2,960 persons. It is assumed that sixty years will be allowed for repayment of the principal expended on the buildings, the estimated net receipts from the rents being estimated at 3,100*l.*, and the charge for interest and instalments of principal for the first year after the money is borrowed being 11,220*l.* From this we gather that Liverpool is rich enough with a ½*d.* rate to make a present of 8,000*l.* to the 2,960 persons who are to be housed in the new buildings. It is interesting to note that the cost of the buildings is estimated at 70*l.* 17*s.* per room, not counting the scullery, which will be provided, or, if this is counted as a room, then the cost is 50*l.* 10*s.* per room. Unfortunately, experience shows that the estimates made before a municipality starts a philanthropic housing scheme do not always or usually tally with the cost that has to be met when the scheme has matured. The tenants having been given something often take a bit more, and do not pay their rent even if they condescend to occupy the homes kindly provided for them out of the rates, which they do not always do.

ARCHITECTURE: ITS TRUE PRINCIPLES.—XXI.

By R. Owen Allsop.

Practical Balancing.

We have considered that that geometric solid that has the greatest cubical contents is dominant in effect over that which has less. The truth of this is more apparent when we consider how the plain geometric formation, such as the large, plain, rectangular mass, is the more effective, the less broken by lines or enrichments. As respects, therefore, mere domination of mass, there is little or nothing to be done to make a small mass hold its own against the larger. We are consequently compelled to look to other means of establishing a balance than by mere weight of solid form.

If we take a composition consisting of two rectangular plain forms, the one cutting the other, and the end of one brought into a gable facing, say, the street—a common arrangement in house-building—such a design on elevation will look "top-heavy," out of balance and very "lop-sided." We have, however, considered the matter of elevation. What we want to find out is—*what is round the corner?* The effect of perspective upsets every draughtsman-balanced composition. Therefore, the subject of balancing in architectural design, when concerning massing, must be considered always in perspective. Now, in the case instanced, perspective affords us a view of the end of the other rectangular mass, and if this is suitably treated the *coup d'œil* may be one of balance. The effect of such a design is in perspective totally different from what it is in elevation. We can see the other gable and the elevational want of symmetry is not apparent.

The moral of this consideration is that all practical balancing must be accomplished not on elevation but by considering the effect of the building all round. If the designer has not the imaginative mind's eye he should make perspective sketches from all points of this composition. Only in this way can the true effect be observed. Great experience and observation of the effect of massing and grouping is required to produce a balanced perspective effect of elevational asymmetry, although, as we have pointed out, practical laws of perspective are all in favour of the asymmetrical design, that is providing it has one prominent axis of symmetry in the plan.

Failing a oneness of motive—as in cruciform structures for religious purposes—we must necessarily fall back upon the artist's method of *providing one dominant feature.* We must take our lessons in balancing and grouping for effect from the artist. He trains his eye to detect the beautiful and interesting. To such, it would seem, bi-symmetry is the one effect of all others that he strives to avoid. In pictorial composition the first principle is the avoidance of the symmetry of halves, or the use only of such effects of this as naturally arise in perspective. The main object of the artist is to create interest in his picture, and to this end he creates an artificial point—the "principal object." If then the architect considers his composition from the view of the artist he will see to it that his design purpose has varied interest and that certain objects have superior value (in point of eye and mental interest) to others, and that one certain point constitutes a true climax. The last thing the picture-maker would dream of doing (if his work included architectural representation) would be to represent anything approaching to the architect's "elevation."

At first thought the reasonableness of this is not apparent. The architect goes to trouble to produce that which has the bipartite symmetry of design. He considers it a beauty—and up to a certain point, condition and circumstance, we are all agreed as to this. But if the effect of bi-symmetrical design is of itself a beauty, why does not the artist endeavour to reproduce this effect in his picture? We see that his aim is entirely contrary. The whole question seems to turn on the point that there is no such thing as visual bipartite solid effect in nature. The only approxi-

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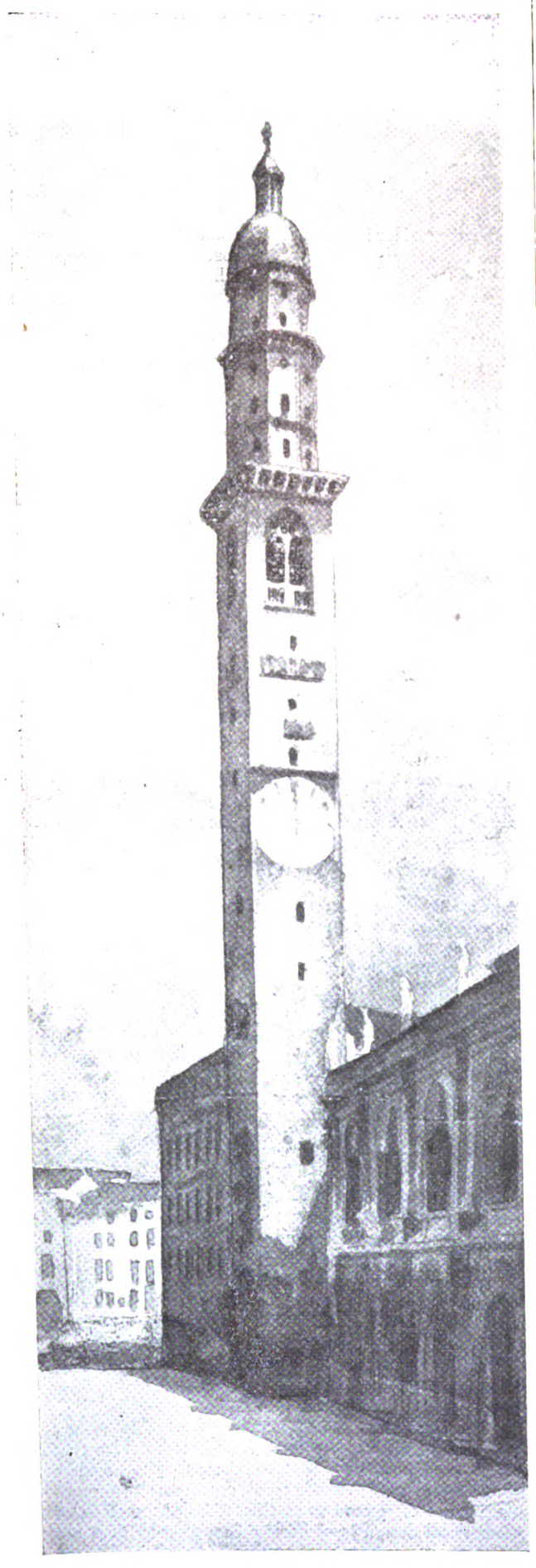


Fig. 43.

mately true effects in this way refer to superficial—plane—designs; as the smallest object of symmetrical design in three dimensions is not seen as such.

Concentration.

Practical balancing then resolves itself into the concentration of thought of the designer, as respects both massing and enrichment by work on surfaces or solids, on certain desirable parts. The eye in this way is attracted to a certain group or mass, or to a more enriched portion. We do not mean more carved enrichment, but more "work," more thought in arranging necessary features. If we have quite a plain façade we naturally are led to examine any special feature such as a beautiful porch or bay. If the object be lifted up in fig. 43 the attention is more powerfully attracted, as might be naturally expected.

Concentration in design is concentration in work, the outcome of a powerfully concentrative mind. The correlative state to mental diffuseness would be, in architecture, an "all-over-alike" effect. The best example of scatter-brained architecture is seen in examining a design where all necessary features are slurred over, and a hasty endeavour evidenced to elaborate plain wall surface. The one patent fact evidenced in such cases is a complete lack of grasp of the problem. This is always to be noted in addition to the actual neglect of the requirements of concentration. The surest sign of competent architectural work is the attention bestowed on small necessary features (as door and window) in a plain block of building. The most certain evidence of an absence of this is the lean, starved, badly-proportioned, badly-arranged window and door. Modern domestic architecture will everywhere bear witness to the truth of the statement. For, not to go further than the humblest house building for examples, how often is an otherwise uninteresting domicile rendered attractive by a little concentrated thought or design in say a porch or bay window?

The great benefit of concentration is that it economises our powers and resources. The scatter-brain is really doing (or trying to do) several things at once, and probably, even after all, his mind is continually on the wander from subject to subject. Power arises from concentration of energy, a concentration on some definite purpose with some definite aim and goal. It is moreover the essence of effect, as such. A few diamonds scattered over a table do not have the potency of effect on the eye of the same gems concentrated into a ring. Hence in the same way so much enrichment bestowed over the part of a building cannot have the same powerful effect on us that it does when concentrated into the (approximate) point. Concentration and condensation are terms of practically similar import in questions of design. The considerable cloud of vapour necessary to form a gem-like dew-drop may be exemplified as an example of concentration and its effect. Before was diffuseness—that which was "without form and void." A regiment of soldiers diffused over Salisbury Plain cannot have the effect of the battalion close-phalanxed. The life of the plant is in some measure concentrated in the flower—an instance more of concentration of time effects. The sculptor's work in a Gothic capital, at say Lincoln, would never be so effective if diffused over shaft and base as well.

If we rightly understand the principle and the whole signification of concentration in art matters, we shall never be "bizarre." It will be impossible to be vulgar. The "low," the loud, building is always characterised by prodigal diffuseness. Its "decorations" gossip.

An idea of a whole conception—a theme—is after all a condensation from that which was diffuse, nebulous. So we have condensation upon condensation—the façade as an entity and the window as an entity on that, the shaft in the window again, and the cap on the shaft, all concentrations from the primordial substance, the architect's memory or note-book perhaps, unfortunately. The concentrator arrives at clear-cut aims, he does not get a mixed-up jumble of incongruities, or half, and ill-considered ideas. He speaks not with uncertain tongue. His issues are plain, and his ends always definitely in view. He does not waste either space, material, or time

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(1) because he gets by concentration the required object and required effect in the least possible space; (2) because he uses the least possible material substance to accomplish his aims; and (3) because concentrating his energies, he accomplishes his object with the least delay, and without hesitation. It will be observed that concentration is a high faculty in art, and if not intuitive (which it seldom can be) comes by experience alone.

(To be continued.)

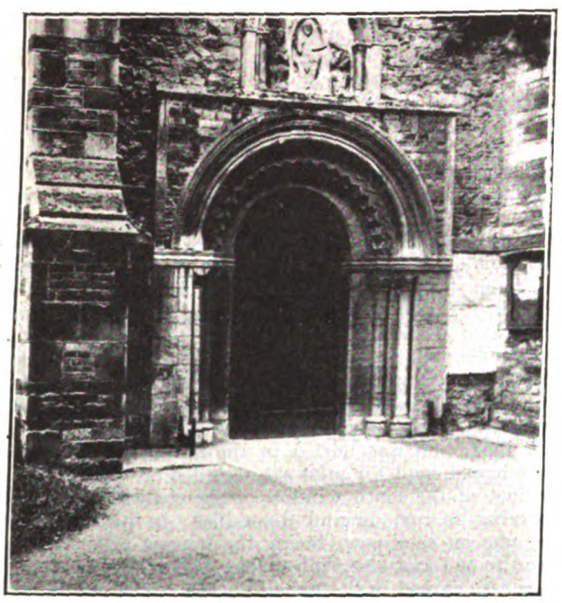
ELSTOW, SOUTHILL, OLD WARDEN AND WARDEN ABBEY.*

ELSTOW (Helena's Stowe), on the Ouse, one mile south of Bedford, was once a market town, with a market hall, known as the Moot House, still standing at the end of the Green, a brick and timber building, lately used as a chapel and erroneously stated to have been the guest hall of the abbey. At the western end is a stump of an old stone cross. The village will be for all time noted as the birthplace of John Bunyan, the tinker's son, himself a tinker, preacher and author, who suffered for conscience sake. He was born in 1628 and was baptized in the church on November 30, in that year, died at the house of a grocer, at the sign of "The Star" on Snow Hill, Holborn, August 13, 1688, and was buried in Bunhill Fields burial-ground, in the city of London. His ancestors are known to have lived in Bedfordshire from 1199, if not earlier, and their connection with Elstow dates from 1327. A well-known cottage, recently almost rebuilt, with two small gables, standing alone on the Bedford Road, which we have passed to-day, was occupied by him after his marriage in 1646, but that in which he was born exists no longer.

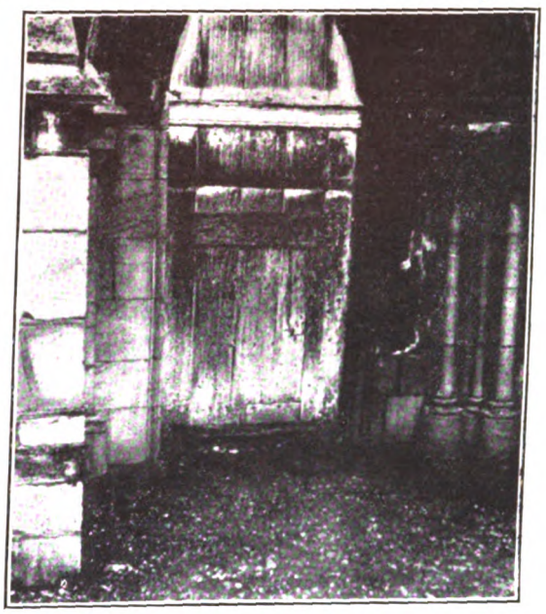
In the time of Edward the Confessor, Elstow, then known as Elnestou, was part of Meldone (Mauldon), but paid "geld" to Camestone (Kempston). It was valued at 10*l.* and was held by four sokemen, who could assign or sell it. Saca and socn were granted by the king, and conferred the power of holding courts for settling disputes and imposing penalties, and the tenants of the lordship who were free husbandmen were the socagers or sokemen, virtually the jurors.

The Benedictine nunnery, dedicated to the honour of the Holy Trinity, St. Mary and St. Helen, was founded in 1078 by Judith, daughter of Adelaide, Countess of Aumale (half-sister of William the Conqueror) and widow of Waltheof, Earl of Northampton and Huntingdon, probably as an atonement for her husband's death, caused by her giving information of his disloyalty to the king, by whom the nunnery was in part endowed. It was secured by many royal charters, granted by Henry I. and other succeeding kings: Henry II. granted two, one for a fair to the nuns for four days, on the Vigil of the Invention of the Holy Cross, the day of the Festival, and two days after. At the date of the Dissolution the abbey was in possession of twenty-one nuns, besides the abbess, Elizabeth Boyville, and was surrendered August 26, 1540, and was then valued at 284*l.* 12*s.* 11*d.*, according to Dugdale, and 325*l.* 2*s.* 1*d.*, according to Speed. By the first scheme of Henry VIII. and Bishop Gardiner, Elstow was to be retained as a cathedral for Bedfordshire and the Act was passed in 1539. The site was granted by Edward VI. to Sir Humphrey Radclyff, a younger brother of the Earl of Sussex, by deed, dated July 3, 1553, three days before the King's death. Sir Humphrey died August 13, 1566, aged 57, and was buried in the church

From his successors Thomas Hillersden purchased the whole of the property for the sum of 700*l.*, including the advowson of the vicarage, and erected a mansion house probably in the reign of James I., and called it Elstow Place: of this building little now is left save a ruined façade, with square mullioned windows and a Jacobean porch. A most important piece of the original nunnery, said to have been the chapter-house of the novices, or "white-veiled" and non-professed sisters, is now used as a vestry, attached to the south aisle of the church. It is a square chamber with a rather low vaulted roof, supported by a central pillar of dark Purbeck marble. In 1792 the manor was purchased by Samuel Whitbread, Esq., and is now in possession of his direct descendant. Elstow Church consists of choir, with clerestory, lofty clerestoried nave, aisles, north porch, a vaulted chamber on the north-west and a detached tower. The clerestory of the choir is Norman, that of the nave Early English; in the two western bays of the nave are rich Early English arches, on transitional pillars; the three eastern bays and aisles are Norman. The former chancel extended 77 feet farther east and ended in an apse, beyond which was the lady chapel, and according to Wigram there was a central tower. In the present east end are three Perpendicular windows, beneath which is a half-length mural monument, with kneeling figures of Sir Humphrey Radclyff (owner of the abbey estates) and his wife. The font and ceiling are Perpendicular. The south aisles appear to have been widened, and the north Norman doorway must have been moved out to its present position. Over this door (exterior) is some Saxon sculpture, representing Christ, St. Peter with the keys, and St. Helena. In the south aisle are two brasses with female figures, one of a widow who died 1427—Margery, daughter of Ralph Parlys, who married, in 1396, John Hervey; her second husband being Sir William Argentine. This Hervey was the grandfather of the abbess Elizabeth Hervey of the other brass, who was the last abbess but three, and died in 1524. It displays the finest existing effigy of a Benedictine abbess, with cowl, large loose gown, mantle, cap, and veil falling to the shoulders. The chin and front of the neck are concealed by the plaited wimple, and on the right arm rests the pastoral staff. In the inscription, the day, month and year of her death are left blank, suggesting it had been made in her lifetime and never completed. In the north-east corner



NORMAN DOORWAY, ELSTOW CHURCH.



WICKET GATE, ELSTOW.

* Read at a meeting of the Upper Norwood Athenæum by Mr. T. G. Larkin.

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is the tomb of Mr. Crompton, the magistrate who committed Bunyan to prison; also a stone coffin of the twelfth century, with the remains of a fine cross on it and some good tiles. There are also some recent stained-glass windows commemorative of "The Pilgrim's Progress" and "The Holy War," inserted at the east end of the aisles. Part of the chancel screen and some old pews yet remain; the seat said to be Bunyan's is against the first Norman pillar north. The register dates from 1640. The church was restored in 1882 by Samuel Whitbread, Esq., at a cost of 6,000*l*. The massive tower is entirely detached and is, therefore, a true campanile; the bells were five in number, dating from 1604 to 1655, but the present Vicar, the Rev. C. F. B. Hawkins, added a sixth, Christmas 1908. No. 4 is said to be the one Bunyan rang. It is supposed the lower part formed a portion of the exterior of the nunnery, and was a convenient foundation for a new tower in which to hang the bells. The tower was restored by Mr. F. S. Wigram.

Southill.

In Saxon times Southill, which included Stanford, must have been a place of considerable extent and importance, for in the Survey there are no less than fourteen separate memoranda respecting it. It was then known as Sudgivele, or South Yevell, and in the time of Edward the Confessor, the chief owners of the land, besides the king, were Archbishop Stigand; three thanes named Ulmar, Lemar, and Lewin; and Aldric, Aeilmar, Tuffa, and Ordui. William the Conqueror included a part in the marriage portion of Azelina, and the rest was bestowed on Eudo, Hugh de Beauchamp, William Speck, Richard Pungiant and Walter, Ordui's portion not being interfered with.

It is situate eight miles south-east from Bedford. The ancient church, dedicated to All Saints, is a brick structure of the Early Decorated period, with chancel, nave, north and south aisles and south porch, and Perpendicular, embattled tower at the west end containing clock and eight bells. The register dates from 1538. The interior was modernised, somewhat crudely, in 1814-6, and contains little of interest. On the wall of the south aisle is a monument to Edward Dilly, bookseller, of London, at whose house in Southill, Johnson and Boswell were occasional visitors. The most interesting object is the Torrington mausoleum, or "columbarium," attached to the east end of the church and entered from the outside. Herein lie the first viscount and his descendants, the Byngs. One vault in particular is worthy of note, as it contains the remains of Admiral John Byng, fourth son of the first Viscount Torrington, whose retreat cost us Minorca, for which he was court-martialled and shot. He was born in 1704, and put to death on board the *Monarque*, at Portsmouth, March 14, 1757. The inscription over his tomb, said to have been inspired by Johnson, reads as follows:—"To the perpetual disgrace of Publick Justice, the Honble. John Byng, Esq., Admiral of the Blue, fell a Martyr to Political Persecution, March 14, 1757, at a time when Bravery and Loyalty were insufficient Securities for the Life and Honour of a Naval Officer."

Southill Park is some 4½ miles in circumference; it contains many fine trees, including some cedars, also a lake of about 60 acres, and in the seventeenth century was in possession of the Keeling family. In the commencement of the eighteenth century the house and grounds passed by purchase to Sir George Byng, who was knighted by Queen Anne in 1704 for capturing Gibraltar; in 1715 he was made baronet, in 1721 sworn of the Privy Council, in the same year created Viscount Torrington and Baron Byng of Southill; in 1725 K.C.B., and on the accession of George II. in 1727, First Lord of the Admiralty; he was M.P. for Plymouth from 1706-21, and died January 17, 1733. His descendants dwelt here until 1795, when Samuel Whitbread, Esq., bought the estate, but only lived there a few months, as he died in 1796. During this short period he engaged Holland, the architect, and enlarged the building. The original mansion was the central portion only of the present house, and rested upon a vaulted basement, which he cased in stone and added wings on either side, making it a building of great size and some architectural pretension. The glory of the house is its portraits, and we are much indebted to the present Samuel Whitbread, Esq., and Lady Whitbread for their kindness in allowing us to view them, for so hospitably entertaining us, and with the assistance of their son personally conducting us over. The paintings are by Sir Joshua Reynolds, Sir W. Beechey, Gainsborough, Hoppner, Northcote, Opie, Romney, Wilkie, and many others; the busts by Weekes and others. There are also memorials of John Howard, the philanthropist, who bequeathed his house at Cardington to the Mr. Whitbread who purchased this estate. A souvenir of the visit was given to the leader by Mr. Whitbread, being six sealing-wax impressions of a brass seal found in the walls during the demolition of a cottage at Elstow. It is of thirteenth to fourteenth century. There is little doubt that it is a figure of St. Helena, as it is very like the representation of her in the Saxon sculpture over the north Norman doorway in Elstow Church.

Old Warden.

There are three entries of Warden in Domesday Book. "In Wardone William Spec holds nine hides of the king as one manor. . . . It is worth 6 pounds, as much when received and T.R.E. 8 pounds. This manor 8 sokemen held and could assign their land to whom they would.

"In Wardone, Ralf de Insula holds of the king 1½ virgates. This land belongs to Bicheleswade and it is valued there, and he who held it T.R.E. could not assign or sell it without the leave of him who held Bicheleswade.

"In Wardone, Walter, a monk, holds half a hide of Azelina, and this is of her marriage portion. There is land for a half plough, but it is not there; 1 bordar is there. Meadow for a half plough team and woodland for 40 swine. It is worth 10 shillings, when received, and T.R.E. 20 shillings. This land Goding, a man of Edric the Bald, held and could assign to whom he wished."

The unique model village, as we now see it, is possibly the most picturesque in England, situate eight miles south-east from Bedford, and owes its popularity to Robert Henley, third and last Baron Ongley, who lived in Warden House, Old Warden Park (rebuilt by him in 1872), where his ancestors had dwelt since 1690. He it was who devised the quaint houses we have seen, with thatched roofs, carved rustic woodwork, red painted doors and windows (to harmonize with which the tenants in his time wore red cloaks and tall hats), and this style of building has been well maintained by his successor, Colonel Frank Shuttleworth, whose lodge gates we passed on our way to the church, and to which I specially drew your attention, as they are very handsome.

William Espec, being Lord of the Manor of Warden at the time of the Survey, there is little doubt but that he built the manorial church, and his descendant, Walter Espec, having founded the abbey, enriched it by granting the church to Simon, the first abbot. On Walter's death his property passed to his sister's son, William de Bussey, who confirmed the grant to the abbey. His daughters and coheiresses, Cecily and Maud, in 1199 claimed the advowson as theirs, stating that the late priest Nicholas de Trailly had granted it to them. However, Abbot Warin, by producing his charters, retained his rights. The present church is a stone building, with Perpendicular chancel, separated from the nave by a pointed arch; south aisle, south porch, and an embattled western tower containing six bells. The porch is square and ornamented with carved pinnacles, with some curious corbels at the base, between the two pinnacles a Roman cross, and inside are two ancient windows, without glass. The church, which is dedicated to St. Leonard, was repaired 1841-2, when the stained-glass windows were inserted, and the rich black oak introduced, which was brought from old religious houses in Italy and Belgium; the finest pieces, I believe, were in the old black oak organ, which, when I saw it some years ago, was in the south gallery, but I understand it has been removed to Warden Park (probably when the new organ was erected in the tower arch by Colonel Shuttleworth in commemoration of the first jubilee of Her Majesty Queen Victoria, in 1887). The whole cost was defrayed by the aforesaid last Baron Ongley, who died in 1887, and was buried in the family mausoleum in the churchyard, and his gifts are recorded on a mural tablet at the foot of the south window of the chancel. The black oak carving is curious and diversified, in particular two snakes, one on each pew, facing the narrow aisle, reaching from end to end and about 6 feet long, are worthy of note. A snake is also carved in the panel beneath. The pew immediately behind is ornamented with Decorated crockets, consisting of broad raised leaves attached to the moulding by the points. The balusters to the gallery are carved to represent grapes and vine leaves. The vicarage pew in the chancel has a baldacchino of richly carved oak and is fitted with a hagioscope. Carved representations of holly leaves, berries, flowers, fruits, cones, acorns, and various leaves are to be found throughout the building, many of them very richly clustered; figures of saints are also seen in several panels. The roof of the nave was constructed from oaks grown in the park. At the west end is a full length marble statue of Sir Samuel Ongley, knight, and it

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is strange that a London merchant should appear in the dress of a Roman, with toga, &c. He was director of the East India Company, first Deputy-Governor of the South Sea Company, M.P. for Maidstone, his native place, and died August 25, 1726, aged 80. There are other monuments and tablets to members of the Ongley family, and the walls of the church are decorated with their hatchments. Their arms, too, can be seen in the chancel roof. There are also memorial windows and tablets in connection with the Shuttleworth family, and their richly-carved pew in the middle aisle is also fitted with a hagioscope, and above it, in the angle of the wall, is a white marble memorial to Caroline Jane Shuttleworth, who died December 28, 1899, and is the work of Mabey, of Westminster. It represents the life-size figure of a beautiful woman clinging to the Cross and seated. The everlasting rock is emblematical of "Faith." The figure is surrounded with a polished alabaster niche, supported by a corbel containing inscription, arms, &c., the two columns having entwined round the lower part the lily and passion flowers. In the two spandrils are the emblems of the Cross, the crown of thorns and the chalice. In the frieze over the head is the crown of glory mounted on a shield, with palms of victory. At the summit are groups of celestial cherubs hovering over the monument.

Over the altar is a fine copy of Guercino's "Ecce Homo," and on the south side of the sanctuary is a cinquefoiled arched piscina, in good preservation. The central window on the north side of the nave has some very rare old glass, said to have come from Warden Abbey; it depicts one of its abbots in the white Cistercian habit and with the pastoral staff. Another in the south aisle is interesting; it was presented by Frank Shuttleworth in commemoration of the Coronation of King Edward VII., but is dated June 26, 1902, the date originally fixed for the important function. The twelve-sided Tudor font was obviously for immersion, its inside diameter being 28 inches. The register commences in 1576. There is a costly marble cross in the churchyard to the memory of the late Mr. Joseph Shuttleworth.

Warden Abbey.

Warden Abbey, or de Sartis or Assartis, so-called because it was built in a place which had formerly been a wood but was afterwards grubbed up and cleared, was founded A.D. 1135 by Walter d'Espec (Spec), the great baron who led the English at the "Battle of the Standard" in 1138, and died, a monk, in his own abbey of Rievaulx in 1153. It was for Cistercian monks, colonised from Rievaulx and dedicated to the Blessed Virgin Mary, as all such were, and its foundation charter was confirmed by Stephen in the same year. The Cistercians were a more austere branch of the Benedictines and took the name from Citeaux, in Burgundy, and were founded by Robert de Molesme and Stephen Harding, an Englishman, of Sherborne. They were called White Monks from their habit, were great farmers, and lived as a rule 10 miles from any town; their latest house, however, was built on Tower Hill. Their first abbey was at Waverley, near Farnham, Surrey, 1128.

Among the Warden benefactors were Henry Braybrook, his wife Christine (who owned the manor of West Warden, in Northamptonshire), and their son Wischard; Simon, Hugh, and William de Beauchamp; Malcolm IV. of Scotland; and Roger de Quincy, constable of Scotland; and so lands in Huntingdonshire, Hertfordshire, Northamptonshire, Norfolk and Suffolk passed to the possessions of the monks.

All the abbeys of the Cistercians were exempt from ordinary visitation, and the abbots of Warden were held in the highest esteem and were commissioned to enquire into various ecclesiastical questions that arose, first by King John in 1215, the year of Magna Charta, as to the election of the Abbot of St. Edmund's, and by the Pope Honorius III., in 1217 and 1224, as to the election of the Abbess of Shaftesbury and the Abbot of Tewkesbury.

In 1217 Fulk de Brent, one of the most powerful nobles of the time, was scourged in the chapter-house because he imprisoned 30 of the monks in a dispute about a wood. He not only submitted himself to corporal discipline, but confirmed to the abbey the rights to the wood in question. In 1242 Abbot Adam was made Bishop of Connor, but he returned to the quiet of Warden to spend his last hours. Early in the fourteenth century a Templar was ordered by Bishop Balderley of Lindsey (Lincoln), in whose great diocese the abbey stood, to do penance at Warden. Although one of the richest abbeys in Bedfordshire, the abbot was licensed to beg for money to rebuild the abbey. The work was commenced in 1323, and on its completion in 1366 Bishop Gynwell granted indulgences to all pilgrims who prayed at its altars. The peaceful life of the White Monks of Warden reached the ears of a monk at St. Albans, and Abbot Thomas de la Mare, a little prior to his death in 1396, permitted him to join them. The first abbot was Simon, the last was Henry Emery, and at the visitation in 1535 the possessions were valued at 389*l.* 16*s.* 6½*d.* Emery, wise in his generation, at once wrote to Thomas Cromwell, complaining of the laxity and insubordination of the monks, and so probably obtained a pension, and he consoled himself by marrying a Minoress of London. Its annual revenues at the suppression, according to Speed, were worth 442*l.* 11*s.* 11*d.* It was surrendered by the abbot and 14 monks, December 4, 1538.

The refectory is the only portion now remaining, but Miss Woodward, who lives opposite the ruin, has an old print showing the abbey as it stood in times gone by, a reprint of which you will find in a pamphlet on Old Warden, written by Constance Isherwood, and published by Paternoster & Hales, of Hitchin, which gives a very interesting account, and to which I refer you. The abbey must have been remarkably imposing and effective, judging by the print and the remains now existing, and will appeal to all who take an interest in the historical and beautiful buildings of our land. The ruins bear the characteristic features of the Perpendicular period. The oriel and other windows without cuspings and the crenellations or embattlements and the red brick work are common features of this period; the ogee headed doorway, with the crockets and finial and the remains of a fluted shaft terminating in a finial on the right-hand side of the opening on a corbel of grotesque character, although worn, are interesting, and the spiral brick chimney shaft set upon its stone crow-stepped base is a gem probably difficult to surpass, and well deserves the closest attention. The fireplace and ceiling of the lower room, though dilapidated, will repay an examination. The original building had three projecting bays, the centre one of which was the entrance. The arms of the abbey were *three pears, or, in a field, az.*, and represent the famous Abbott's or Warden's pear well known to this day. "Warden pie" is referred to in the famous song "The Friar of Orders Gray," so the place was famous for its flesh and fowl as well as its fruit.

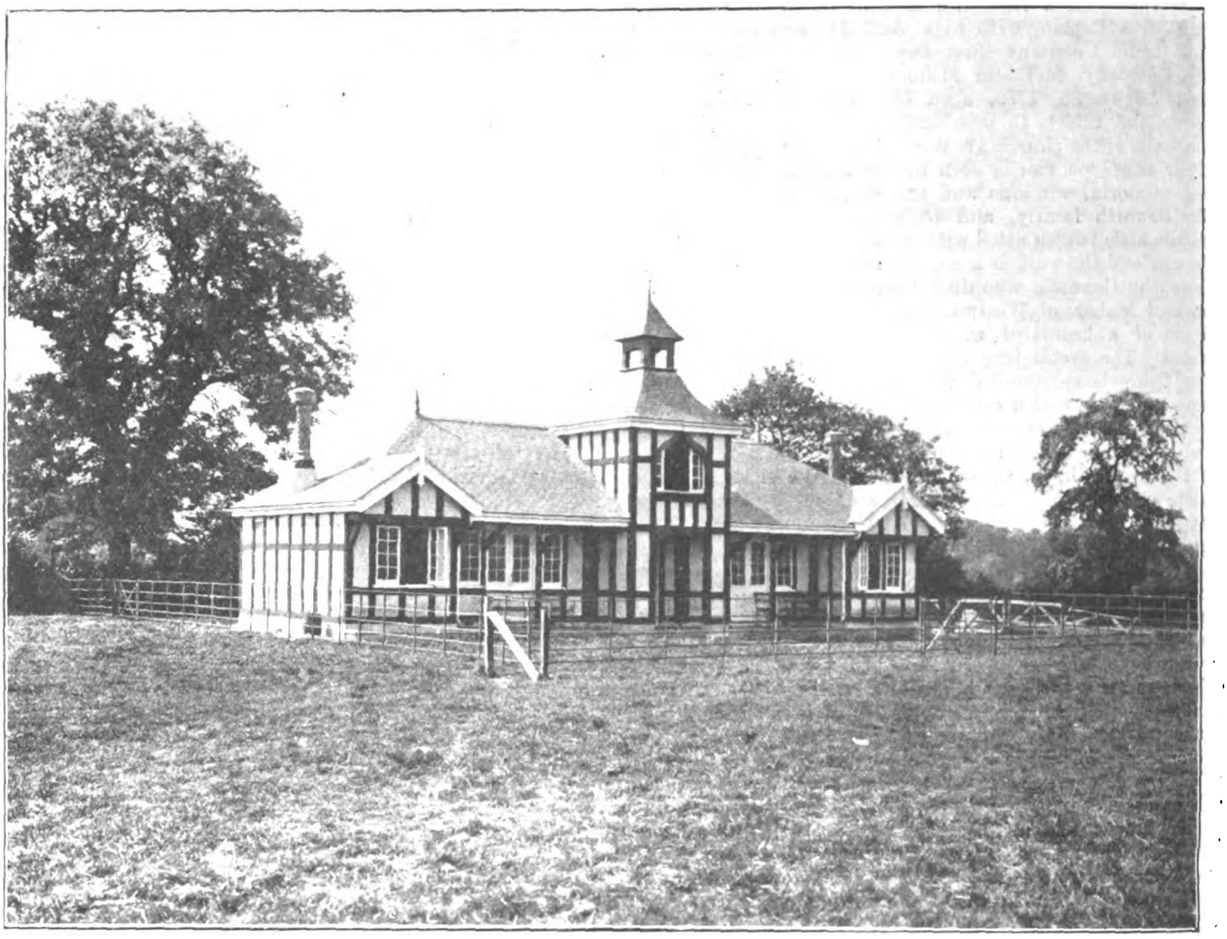
The property passed through many hands after the Dissolution. In 1669 Sir Ralph Bovey possessed it. The late Samuel Whitbread, Esq., purchased it, as he was desirous of preserving it, and the foundations of the abbey were uncovered in 1838, when stone coffins, some containing skeletons, a crozier, and other remains were found. There were also discovered several fragments of carved wood, bosses, &c., on which the painting and gilding retained its original brightness, and subterranean passages have been found during digging operations at various times. It is a great pity the interior is in such a neglected condition.

In compiling this paper I am indebted to the following works, amongst others:—Tanner's "Notes of the Monasteries," Bonney's "Cathedrals, Abbeys and Churches," "Chronicles of the Abbey of Elstow," by S. R. Wigram, M.A., "English Minsters," by Mackenzie, "The Victoria History," Murray's "Handbook of Bedfordshire," and Foster's Guide; "Old Warden," by Constance Isherwood; and the assistance given me by Mr. W. F. Harradence I gratefully acknowledge.

GLASGOW INSTITUTE OF ARCHITECTS.

A QUARTERLY general meeting of the Glasgow Institute of Architects was held last week in the Secretary's chambers, 115 St. Vincent Street, Mr. George Bell, F.R.I.B.A. (President), in the chair. Reference was made to the death of Mr. John A. Campbell, F.R.I.B.A., who had been a member of the Institute since 1889, and it was reported that the Council had minuted an expression of regret at Mr. Campbell's death. It was intimated that Mr. Robert Hall, Inveresk Place, Greenhill, Coatbridge, had been elected an Associate member. The Secretary submitted a report on the matters which had been dealt with by the Council since last meeting. 7*l.* 7*s.* had been granted to the Glasgow School of Architecture for prizes, and the proportion of these prizes, amounting to 2*l.* 2*s.*, granted to the Technical College section of the School of Architecture, had been awarded to Mr. Joseph Wilson, 6 Jedburgh Gardens, North Kelvinside. Local examinations of the R.I.B.A. were held on June 14, 15, and 16 last, and at the request of the R.I.B.A. the Institute has agreed to undertake the conduct of a local preliminary examination on November 8 and 9, and a local intermediate examination on November 8, 9

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NEW PAVILION, ST. DAVID'S COLLEGE, LAMPETER.

and 10. On the representation of the Council, the Govan School Board had exhibited the designs submitted in the competition issued by them for a new school; and the Hamilton (Burgh) School Board had also arranged to exhibit during last week in the Hamilton Public Library the plans submitted for their new academy. A by-law had been framed which gave student members of the Institute representation on the committee of the associate members. It was intimated that the Council had under consideration the arrangements for an early exhibition of architectural work.

NEW PAVILION FOR ST. DAVID'S COLLEGE, LAMPETER.

A PAVILION has this season been erected on the cricket field belonging to St. David's College, Lampeter. The style adopted is the black and white timbered Tudor, of which a good many examples remain in some parts of Wales, notably in Montgomeryshire; but the red chimneys with diagonal and panelled patterns are reminiscent of the East Anglian architecture of the same period. A feature of the building is the bell-tower, which occupies the centre of the front and forms in its lower part an open porch, flanked by a verandah on either side. Above the porch is a chamber providing a point of vantage for the scorers at cricket matches. Within the pavilion are a club-room and a dressing-room, both opening on to the verandah in front. At the back are pantry and lavatories. The front and side walls are of half-brick, built between the wooden framing and faced with cement. The timber work on the outside and the rafters within are painted with Major's Solignum in dark brown tint, while the rooms have a dado in unplaned wood treated with green Solignum. The architect was Mr. Ll. Bankes-Price, of Lampeter, acting in consultation with Professor Tyrrell Green, of St. David's College. The chimneys, finials, &c., were supplied by Messrs. Dennis, of Ruabon, and the work has been satisfactorily carried out by Mr. William Jones, builder, of Lampeter. The total cost of the pavilion may be put down at 300*l*. Our view is from a photograph by D. J. Davies, of Lampeter.

ILLUSTRATIONS.

Selby Abbey.—South-west view—South-east view—South side—Tower and north transept.

OUR illustrations, from photographs specially taken for us since the reopening of Selby Abbey on Tuesday in last week, show the present condition of the church after restoration by Mr. J. Oldrid Scott, F.S.A., of which a full account will be found in our leading article.

Cottages at Beaconsfield, Bucks.

THIS group of cottages is designed for the employees on an estate near Beaconsfield, Bucks, and the accommodation consists of two living rooms and three bedrooms. The half-timbered work is to be of English oak and the roof is to be covered with old tiles from farms which have been pulled down on the estate. The contract price for these cottages is 875*l*. The architect is Mr. Stanley Hamp, of the firm of Collcutt & Hamp, and the drawing we reproduce was exhibited in this year's Royal Academy.

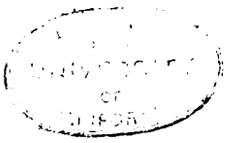
Liverpool University School of Architecture.—Detail from Trinity College, Cambridge.

THE detail from Trinity College, Cambridge, shows the kind of work done by the students of the Liverpool University School of Architecture during their vacations, and is in further illustration of our leading article of last week.

Blantyre School Board, N.B., has decided to erect two new schools in Calder Street, Blantyre. One of the schools is to be for elementary education and the other for higher grade education, the total cost being 10,000*l*. It was agreed to have competitive plans from eight architects. Mr. William B. Dow, Glasgow, was appointed measurer for the new buildings.

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. 29, 1900.



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SELBY ABBEY: SOUTH-WEST VIEW

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SELBY ABBEY: SOUTH SIDE.

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COTTAGES AT BEACONSFIELD

STANLEY AMP, Architect

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Exhibited 29th 1909.



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Cottages at CONSFIELD, BUCKS.
P. Architect.

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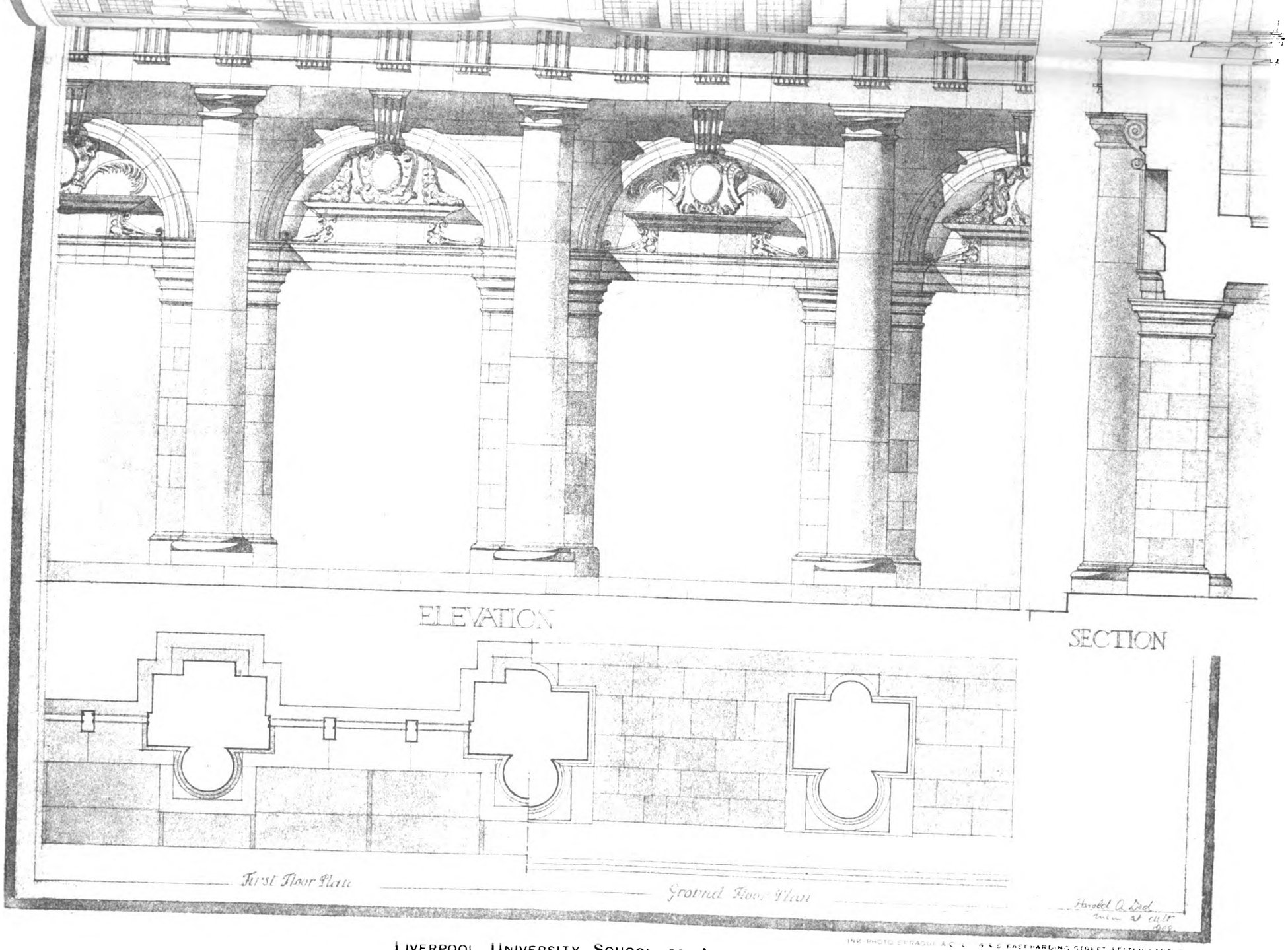
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LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

DETAIL FROM TRINITY COLLEGE, CAMBRIDGE. Measured and Drawn by H A. DOD

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UNIVERSITY OF CALIFORNIA

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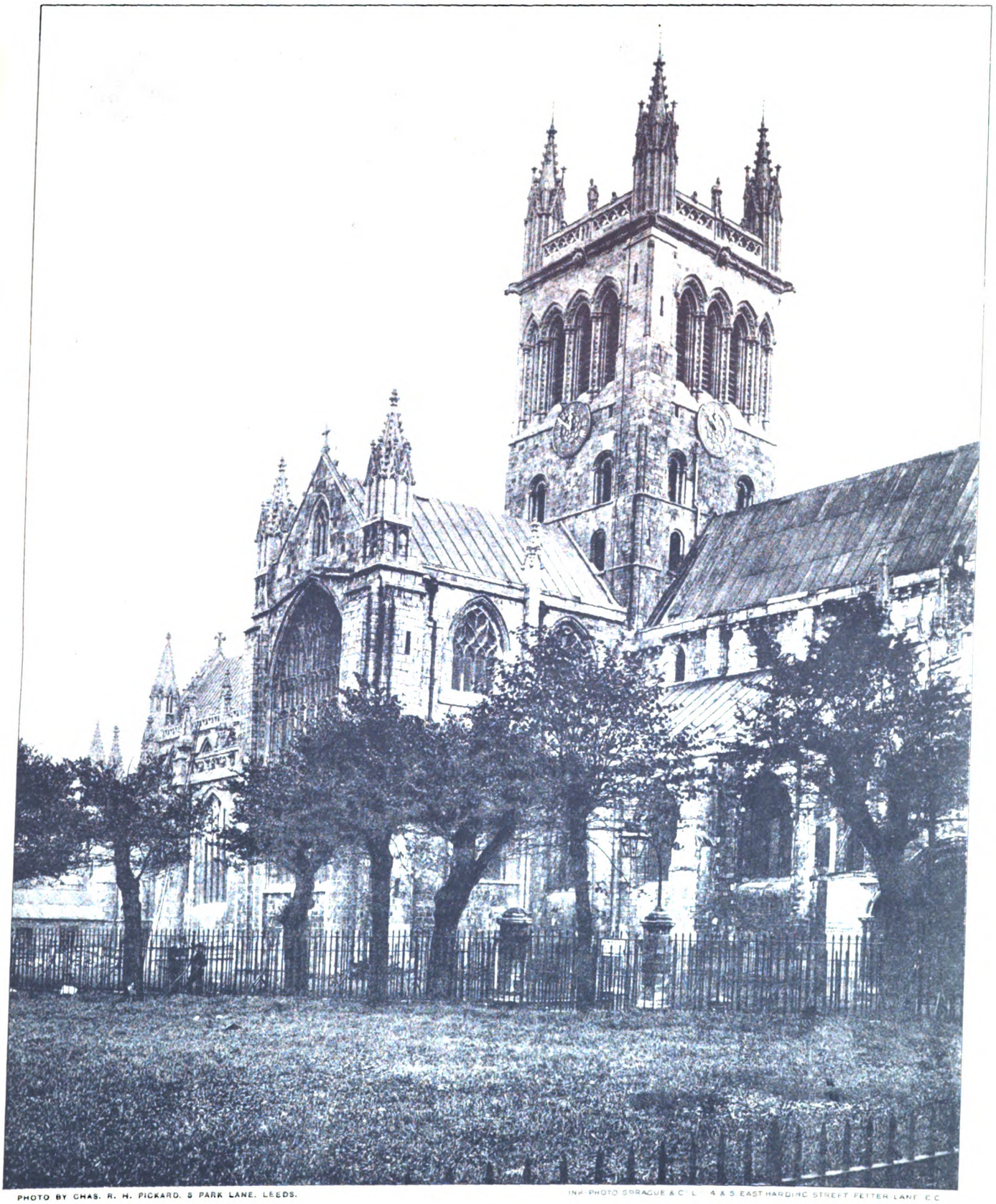
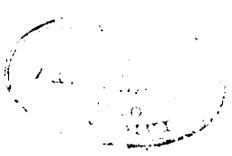


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SELBY ABBEY: TOWER AND NORTH TRANSEPT.

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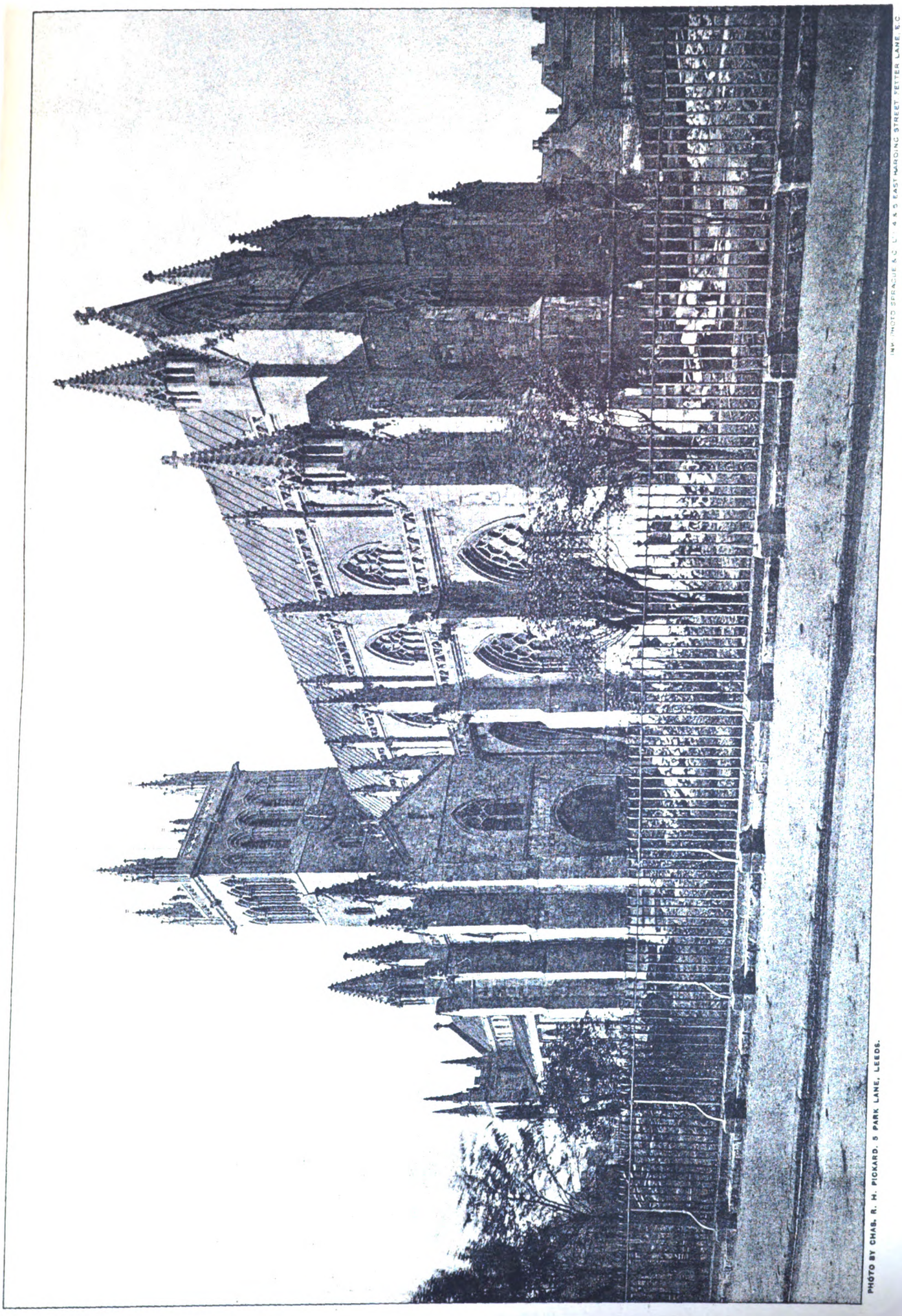


PHOTO BY CHAS. R. H. PICKARD, 5 PARK LANE, LEEDS.

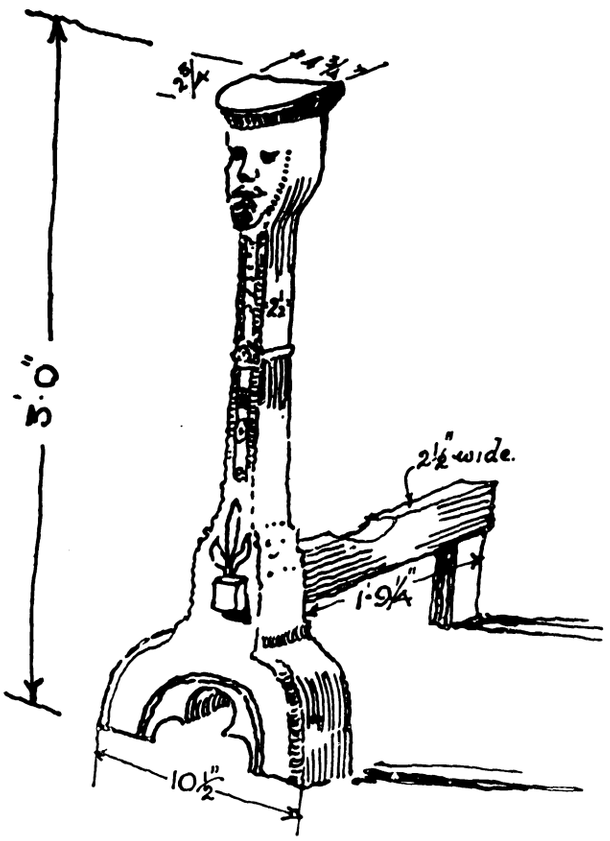
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SELBY ABBEY: SOUTH-EAST VIEW.

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FIRE DOG, HOTEL DE VILLE, DAMME.
From a Sketch by Banister Fletcher.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last in the premises at Tufton Street, Westminster, Mr. Henry Tanner, F.R.I.B.A. (President), in the chair.

On the motion of the President, seconded by Mr. Henry T. Hare, the Council's report and balance-sheet for last session was unanimously adopted.

The following gentlemen were elected members:—Messrs. George West, T. B. Whinney, M. Robertson, E. T. Dunn, H. C. Pullin, C. E. Worthington, E. A. Stone, C. A. R. Barry, T. J. Burnie, E. K. Smith, L. R. Thomson, A. B. K. Cook, W. W. Nimmo, H. D. Hendry, K. B. Mackenzie, H. R. Chanter, L. E. Williams, H. Sawyer, E. Belfield, N. F. Woodroffe, S. J. Edwards, G. B. Owen, P. H. E. Bagenal, N. C. Theodossatos, C. E. FitzSimon, R. Kirby, W. A. C. Adams, T. F. Ford, W. F. Dawson, H. J. Birnstingl, W. T. Ching, S. T. Nunn, H. E. Breach, J. B. M. Walch, E. L. F. Davey, G. W. Stuart, C. C. Sealy, E. R. Jarrett.

Mr. F. Dare Clapham, F.R.I.B.A., read a paper, illustrated by sketches and lantern views, entitled:—

Cheltenham and District.

It was in 1895 that the Architectural Association first visited this district, and most of the places then seen were again on the programme for this year. As before, our headquarters were at Cheltenham, and it is interesting to record that there were, out of the twenty-six members who formed this year's party, nine who had been on the earlier excursion. All the places visited were, with the exception of Gloucester, in the Cotswold district, which lies to the east of Cheltenham.

Geologists inform us that at a certain remote period in the history of the earth, Leckhampton Hill, which rises above the town of Cheltenham, was a high cliff, overlooking the sea, that this sea entirely covered the valleys which now extend from the Bristol Channel to the North of England, also that the hills in the immediate neighbourhood, Bredon and Churchdown were islands rising out of these waters. They were bounded on the west by the Welsh mountains, and in course of time a great upheaval of the northern portion took place, so that the lower part became an estuary running up from Gloucestershire into Worcestershire and Warwickshire.

From the number of barrows and weapons which have been discovered in this district, it was probably a popular one with the Ancient Britons, and when in the middle of the first century the Romans conquered this part of the country they raised and enlarged the earlier fortifications.

It was in the year A.D. 43 that the Romans completely routed the British army and drove them from the Cotswolds, the city of Gloucester being captured by the Emperor Claudius himself. They established a chain of watch-towers on the various hills and built several military roads—Ermine Street, between Gloucester and Cirencester, the Fossway over the Cotswolds to the north, and Icknield Street, which led to Wales—these exist to the present day.

Christianity was introduced soon after the Roman Conquest. Probably this district was the first to embrace the Christian faith, and it is believed that St. Paul himself preached in Gloucester.

The Romans existed in these parts for a period of 400 years, and, as showing the extent to which they populated this neighbourhood, out of just over 300 parishes in Gloucestershire, Roman remains have been found in about a third. They soon discovered its fertility, for about the end of the third century they started to cultivate vines, and in the earliest Anglo-Saxon charters vineyards are constantly referred to, and the willow is mentioned as being cultivated for binding the vines towards the end of the sixth century.

The Saxons defeated the Romans in a big battle at Derham, capturing the two Roman cities of Gloucester and Cirencester, and during the Heptarchy this district became incorporated in the kingdom of Mercia, and Cheltenham, which occupied a position between the two royal residences Winchcombe and Gloucester, became an important place, and the manor was the property of the Crown.

A Benedictine priory was founded in Cheltenham at the end of the eighth century, and about 100 years later a monastery was built by King Offa in the village of Cleeve.

In the middle of the eleventh century King Edward the Confessor became Lord of the Manor of Cheltenham, and granted it a charter, and from that time until the reign of James I. the manor was generally held by the reigning monarch.

In the year 1628 the Prince of Wales, afterwards Charles I., sold the manor to John Dutton for 1,200*l*. It remained in the Dutton family for over 200 years, and in 1776 was sold to Lord Sherborne, and when it was again sold in 1843 it realised 39,000*l*. While on the subject of land it is interesting to record that in 1086 William the Conqueror, while holding his Parliament at Gloucester, decided on the survey of England, known as the Domesday Book. In this record Cheltenham is spelt Chinteehe, about twenty years later it was spelt Chilt, and the modern spelling of the name does not occur in any documents until the Manor Act of 1625.

In the middle of the fifteenth century the town seems to have fallen on evil days, for an Act was passed releasing the lay people of the town from local taxes on account of the poverty of the place, and in 1468 the town petitioned the Queen to allow them to discontinue the sending of two members to Parliament on account of the expense. A few years later Edward IV. halted in Cheltenham for a short time with his army on the eve of the battle of Tewkesbury. The town seems to have suffered during the Civil Wars, and afterwards its history is so obscure that it probably degenerated into quite a small village, for in 1666 there were only 1,500 inhabitants and just over 300 inhabited houses, and even 130 years later there was only a slight increase in the population. It was at this time, however, that the mineral waters were discovered, and the prosperity of the town was renewed, for in 1811 the inhabitants numbered 8,000, and in 1861, 36,600.

In the early part of the seventeenth century this district was noted for the cultivation of tobacco. It was a flourishing trade in 1652, when in order to encourage the English plantations abroad an Act was passed "prohibiting the planting of tobacco in England," which, as recorded in the "perfect Diurnall" of the House of Commons, "materially affected the interests of many persons in Gloucestershire, particularly Cheltenham and Winchcombe." The inhabitants of these two towns petitioned against this, but without success, and troops were sent from Gloucester to destroy the plantations, but the people drove them back; the industry, however, seems to have gradually died out.

Cheltenham has been termed the Garden City, and it certainly abounds in gardens, both public and private; it is beautifully situated in the valley of the Severn at the foot of the Cotswolds, which bound the valley on the east side, while on the west are the Malvern and Forest of Dean Hills. From these hills come numerous springs, forming brooks,

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which run through the villages of the district and make them so picturesque. At Seven Kings, about four miles from Cheltenham, the river Thames has one of its sources.

The Cotswold district was for centuries celebrated as the centre of the sheep-farming industry, and even 800 years ago wool from this district was exported to Flanders and elsewhere, and, judging from the size of the farms and the outbuildings generally, the farmers three or four centuries ago must have been very prosperous.

The Domestic architecture is probably as interesting and characteristic as that of any other part of the country. Its chief charms are its great simplicity and splendid proportion. The character of the work is generally the same owing to the natural use of local materials, built according to local traditions, and influenced by surrounding conditions.

The houses were generally built in some sheltered position, often on sloping sites, but beyond this precaution very little attention seems to have been paid either to aspect or situation. The whole district being a stone one, all buildings were constructed in limestone, usually quarried from the immediate neighbourhood. The stone weathers well, and when first quarried is distinctly yellow, but it soon tones down and takes on after exposure all kinds of beautiful greys and yellows. In the better class of work the exterior walling was executed in ashlar, carefully dressed, with upright joints, and laid square on bed. The plans of the houses were very simple, and the stone outer walls were 2 feet to 2 feet 6 inches thick, the internal divisions being simply lath and plaster or oak panelling. In order that they might be roofed in one span the plan was usually one room deep, the rooms being 16 feet to 20 feet wide. The roofs were of a steep pitch, and covered with stone slates laid in diminishing courses, and the roof space was used for bedrooms and lighted by windows in the gable ends or by dormers. Very often the wall plate was placed in the centre of the wall, and the stone slates at the eaves were bedded on the wall with only a slight projection, which gave a considerable tilt to the eaves. There were no gutters, and at the inter-sections of the roofs the stone slates, which were laid without any torching, were brought round in a sweep, a method known locally as "galetting," and the ridge-piece, too, was sawn out of a block of stone. In many cases the copings to the gables are only a few inches higher than the stone slating behind, and in the smaller houses the slates simply project a little in advance of the wall face. The chimneys were usually carried up centrally over the ridge, the flues being built separately, either square or diagonally in groups of three or four; they were formed of thin sawn blocks of stone, and finished with a moulded cornice and a weather mould at the base as a protection to the roof. The finials on the top of the gables and over the springing stones are of great variety, and were often pierced on all four sides. The windows have stone mullions with square heads and a label mould over. These labels were very often carried round the house as a string course, and in several houses there is a set-off at each string course. The lights were narrow and squat, and usually decreased in number on each succeeding storey. There was generally a thicker central mullion where the lights exceeded three in number. The lead glazing of the windows was ornamental, and the opening casements were fitted with wrought-iron fastenings, very often beautiful in design, and showing what excellent work used to be executed by the local smiths. There was no external porch, and where one does occur it has usually been added at some later date. The doorways were simple, the doorhead being, as a rule, four-centered and out of one stone, and internally there was no arch, but always a flat lintel. All the original doors were plain, and, like the windows, the wrought ironwork was always good in design. A predominating feature of the inside of the houses was the large open fireplace, very often of great width compared with the size of the rooms. The staircase was placed in the centre of the house, and in many cases had a solid newel about 5 feet square, with solid oak treads, and when the house was built on a sloping site the different levels were very cleverly arranged. Most of the work in the district was executed between the end of the sixteenth and the close of the eighteenth century.

About five miles to the north-east of Cheltenham is Postlip Hall, picturesquely situated on the slope of the hills and overlooking a valley on the south. Originally the house consisted of three distinct blocks of building, the eastern part being a farmhouse, with a dwelling-house on the west and two cottages to the north. Not much is known of its early history, but at the beginning of the seventeenth century the house was rebuilt by a certain Giles Broadway, or Giles of Broadway.

The main elevation which faces south has a frontage of 94 feet, broken by three bays and roofed with a range of sharply-pitched gables, six in all, the one on the east being wider than the others, and evidently the older part of the house. The return elevation on the east has a series of small simple dormers along the whole length of the roof. In the centre of the house is a picturesque courtyard, containing a circular fountain, which gives it quite a continental appearance. Internally there are some fine rooms richly panelled, and some good chimneypieces. The best room is the drawing-room on the first floor, which has some good panelling that has not been tampered with, and an elaborate stone chimney-piece with some curious emblematical figures in the upper part, one representing apparently Temperance triumphant over Intemperance. The chimneypieces in the dining-room and hall are richly carved in wood, but appear to have been made up to a certain extent. The one in the dining-room is dated 1614, and bears the initials of the original owner and his wife. The staircase, like others in the district, winds round a square newel wall, and has solid oak treads with a nosing worked on.

On the slope of the hill behind the house on the north side is a small Norman chapel dedicated to St. James. Its origin is interesting, for it appears that the tenants of Postlip, in the early part of the twelfth century, petitioned the Lord of the Manor, William de Solers, to build them a chapel in their immediate neighbourhood, as, owing to the unsettled state of the country during the civil wars, they were afraid to attend their parish church. At the time of the Reformation it was despoiled and allowed to fall into decay, and until twenty years ago was used as a barn. It was restored in 1891, and is now used as a private chapel. It is an interesting Norman building, with a doorway on the south side. Perpendicular windows have been inserted in the west and east ends, but the original Norman windows still remain on the north and south sides, mere narrow slits in the walls with a deep splay inside. Over the chancel wall is a simple stone bell turret, and another interesting feature is a small opening high up in the nave wall on the south side with an external corbel; this was probably intended to hold what is known as the "Poor Soul light," which was a lamp lighted nightly to remind those who passed by and s w it to pray for the souls of the departed. At the foot of the hill to the south-west of the house is an old barn, cruciform on plan, about 96 feet long and 28 feet wide, and the manor house, chapel, and farm buildings form a very picturesque group amidst the surrounding trees. A few miles further along this road is Winchcombe, an ancient town called in Anglo-Saxon times "Wincelcombe," which means "a corner of the valley," a very appropriate name, as it lies at the end of a beautiful valley, almost entirely encircled by the Cotswolds.

In the ninth century Winchcombe was the capital of Mercia and a royal residence, but its importance was chiefly due to the fame of its abbey. King Offa built a nunnery there in 787, and towards the end of the same century his son Cenulph founded a Benedictine abbey on the same site for 300 monks and dedicated it to the Blessed Virgin Mary. At his death he was succeeded by his young son Kenelm, aged seven, who was murdered by order of his sister. Tradition says that the fate of the young king was miraculously revealed in various ways. At any rate, when his body was discovered it was removed to Winchcombe, and the abbey in consequence became popular as a place of pilgrimage, as the relics were credited with working miracles. A famous historian of the period, William of Malmesbury, says "that there was hardly any place in England more venerated." The abbey was partially destroyed by the Danes, and it is believed to have passed into the hands of secular priests, but towards the end of the tenth century it was rebuilt and given back to the Benedictines. Up to the reign of King Canute the town had been a county in itself, but it was then united with Gloucester. The town was made a borough in the reign of Edward the Confessor, and the Domesday Book records that the possessions of the abbey were unusually large, no fewer than nineteen manors being attached to it. The abbey was destroyed by fire in 1151, and rebuilt again in 1239. That it was considered of great importance is confirmed by two facts—first, it was a mitred abbey, and its abbot sat in the House of Lords; and secondly, Edward III. granted it permission to fortify its buildings, a rare privilege and one seldom granted.

On the dissolution of the monasteries the inhabitants, who possessed a parish church, did not trouble about the

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abbey, which gradually fell into decay and disappeared, and now all traces of it above ground are lost. In the fifteenth and sixteenth centuries the prosperity of the town was evidently on the decline, for Edward IV., and later on Elizabeth, granted it charters for holding fairs in order to relieve the poverty of the inhabitants.

But with the introduction of tobacco in the sixteenth century its prosperity revived for a short time, until crippled and restrained by the Acts of Charles I. and Cromwell.

The parish church was built by Abbot William in 1490. The inhabitants themselves contributed 200*l.*, a large sum in those days, and part of the cost was also defrayed by Ralph Boteler, of Sudeley. It is a fine example of Perpendicular work, and consists of a western tower, nave, aisles and chancel. There is no chancel arch, but the division between the nave and the chancel is marked by screens, and in addition across the nave an upper screen or roof truss. There is a lofty clerestory, which makes the church remarkably well lighted.

The pulpit was originally placed against the centre pier on the north side of the nave. There is a curious Jacobean font, dated 1634, and some elaborate sedilia on the south side of the chancel. In the eighteenth century the altar stood centrally surrounded on four sides by rails, with seats for communicants on the south, east and north sides, an arrangement which also existed at the neighbouring church of Deerhurst.

The church contains some good furniture and some fine silver plate. Externally the chief feature is the western tower, with a good weathercock, said to have been brought from St. Mary Redcliffe, Bristol. The church is also notable for the great grotesque gargoyles, some forty in number, on the parapets and tower.

There are several good seventeenth century houses in the town, the best being a picturesque gabled building known as the "Jacobean House," which stands opposite the church, the detail of the entrance front being particularly good. According to an inscription in Sudeley Church, this house was restored and enlarged by Mr. Wyatt in 1879, who had also restored the church some few years before.

Other interesting houses are the George Inn, which was the resort of the old pilgrims, and is inscribed with the initials "R. K.," Robert Kidderminster, an abbot of the time of Henry VII.; and another inn in the main street called "The Corner Cupboard," a long, low, rambling place on the street approached by a flight of stone steps, semicircular on plan. There is also a simple Georgian house with interesting detail.

About one mile from Winchcombe is Sudeley Castle; the property belonged in the olden times to King Ethelred, and was granted by him to his youngest daughter, the Countess of Goda. In those days its value must have been great, for it included a forest of oaks, covering an area of about six square miles.

The first Lord of Sudeley was Ralph, nephew of King Edward the Confessor, and in later times another owner of Sudeley had for a brother William de Tracey, one of the murderers of Beckett. In 1367 the manor passed to Joan de Sudeley, who married William Boteler.

In the French wars during the reigns of Henry V. and Henry VI. a certain Ralph Boteler took an active part and rebuilt the castle from booty gained in the war; he it was who helped to build the parish church in Winchcombe. His services to the house of Lancaster compelled him to surrender the castle when Edward IV. came to the throne, and it came into the possession of Richard, Duke of Gloucester, who later on exchanged it for Richmond Castle, in Yorkshire. Thus Sudeley reverted to the Crown, and in 1509 the manor was granted to Robert Kidderminster. In the reign of Henry VIII. it is said that the castle was going to ruins. It was granted by Edward VI. to Lord Seymour, who made great preparations there for the reception of his bride, Katherine Parr, and round this lady centres the chief historical interest of the castle, for Katherine, the last wife of Henry VIII., surviving him, married a fourth husband in Thomas Lord Seymour, and a special suite of apartments was prepared for her at the castle.

The Queen's chaplain was the celebrated Miles Coverdale, who revised the Bible at the direction of Henry VIII.

Lady Jane Grey was also a frequent visitor to the castle at this time, as was also Princess Elizabeth, who spent some of her early years there, and afterwards as queen was three times magnificently entertained by Giles, the third Lord Sudeley.

Some time after Seymour's death this property passed to Sir John Brydges, who was given the castle and the title of Lord Chandos, as a reward for his services, by Queen Mary.

In the time of the Civil Wars Sudeley was looked upon as the strongest fortress in the neighbourhood, ranking with Berkeley and Warwick, and as the royal forces occupied Oxford it became of great importance, for it could command all the district between Camden and Cirencester, but it was captured by Colonel Massey in 1643 and given up to the Royalists later on at the fall of Cirencester. It again surrendered to Sir William Waller, who trained his guns on the castle from Dunn's Hill on the east, and the Parliamentary forces, although only 300 yards off, are supposed to have only hit the castle once. Later on Lord Chandos seceded to the Parliament, and the Commonwealth ordered it to be rendered unfit for a military post, and it was accordingly demolished after being garrisoned for five years. From this time nothing much is known of the castle, and at one time it became a public-house. In the early part of the nineteenth century the estate was purchased by John and William Dent, of Worcester, and they set to work to make the castle fit for a country residence.

There are some interesting pieces of furniture in the house, among them the bed of Amy Robsart, from Cumnor Castle—it is peculiar as having a secret panel in the head containing a crucifix—and in another room there is the bedstead and tapestry from Marie Antoinette's bedroom, removed here when sold at the Revolution, and there is also some good Spanish leather in the dining-room, and generally the house is full of interest.

Sudeley must have been one of the finest baronial castles in this part of Gloucestershire. The original house was built in the reign of King Stephen, and rebuilt entirely in Henry VI.'s reign by the famous sea captain, Ralph, Lord Boteler of Sudeley. The ruins of the banqueting hall remain to show what a fine room it must have been, being on the first floor, and approached by a stone newel staircase. The windows at the ends and sides of the hall still remain, and the whole forms a splendid example of late Perpendicular work. The northern quadrangle has been restored by the Dent family, and at the same time the church, which dated from the middle of the fifteenth century, and adjoins the house on the east side, was also restored by Sir Gilbert Scott; it had been very much damaged by the Parliamentary forces in 1643, and had remained in a very neglected state. He also designed the tomb with the recumbent figure which is placed over the remains of Katherine Parr, and contains fragments of the old tomb with the lead coffin inside.

Two miles south of Sudeley Castle is Charlton Abbots, a fine Cotswold building with some later additions; and grouped round the house are the old farm buildings, including a large barn, the whole forming a very picturesque group on the slight slope of a hill. The house has three storeys, and is roofed in a single span running east and west; there are three gables on the south side and two on the north, the projecting portion on this side being evidently an addition; on the eastern side of the building is a two-storeyed square bay with the centre light 6 inches wider than the others.

The most interesting feature internally is the staircase, 5 feet 6 inches wide, carried round a square newel wall of the same dimensions, and off each landing doors lead to the different rooms, the various levels of the different floors making the external elevations particularly interesting. In one of the first-floor rooms, which is panelled and has a segmental ceiling, there is a seventeenth century carved oak chimneypiece, and in all probability the house was originally far richer in panelling than it is at the present day, as it has now been converted into a farmhouse. Near the house is a small church, and it is said that there used to exist in the village a lazar house belonging to the Abbey of Winchcombe, but at the present day no trace of it exists.

Leaving Charlton Abbots and going south another mile along the road is Sevenhampton, or, as it is often called locally, Sennington, which has a manor house with a church adjoining. The latter is a small cruciform building, with a central tower, transepts, and no aisles; the curious feature of the tower is that it is narrower than the nave, and is placed east of the crossing, so that the western piers stand free. These piers have been strengthened by flying buttresses placed diagonally inside the church from the piers of the tower to the corresponding angles of the nave and transepts. The tower, which is lighted by windows above the roofs of the transepts, has a turret staircase on the south-east angle. The porch, which is on the south side, has a good door with a four-centered arch and pierced tracery head.

The dimensions of the church are interesting. The nave is only 13 feet 9 inches wide, and the total length of the church is 84 feet. The internal dimensions of the tower are 10 feet by 9 feet 6 inches. The greater part of the church

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is fifteenth-century work, but the chancel is earlier, and has single lancet windows on the north and south sides; probably the south porch and the tower were built at the close of the fifteenth century as the result, so a memorial in the church informs us, of the bequest of a certain John Camber, to whose memory a brass has been placed in the chancel bearing the date 1497. The east window is a three-light Perpendicular one, and probably replaced an earlier one of the thirteenth century. Between the north transept and the chancel is a passage which may also have served as a hagioscope, and the stone forming the roof of this passage is believed to have been an old altar stone, as there are traces of crosses on it. In the chancel also there is an old stone shelf which shows the height of the original altar; it is interesting, as it was not usual to raise the altar above the floor level in the early days of the Church.

The manor house, which is to the north-west of the church, is a seventeenth-century building, but it has been very much modernised both internally and externally, and the only old part is the back or eastern side. One of the windows in a room on the attic floor has a stone sill, with a stoup for holy water, and, as in earlier days the house was used as a retreat by the nuns from Sudeley Castle, the room may have been used as a chapel. An interesting feature of the outbuildings is the small four-gabled dovecote over the stables.

Another short walk will bring you to Whittington, which is only about five miles east of Cheltenham, on the Oxford road. The village is particularly picturesque, for most of the cottages have very small square bay windows. The manor house is a typical specimen of the local architecture, but unfortunately the west wing has been pulled down and replaced by modern additions; the north or main elevation has three pointed gables with windows which still retain their original glazing. Like other houses in the neighbourhood, the most interesting feature internally is the open newel staircase, 5 feet 9 inches wide, which goes from basement to attic in a series of flights of seven steps each; at the top of the first flight is a quaint and original dog-gate. The whole staircase shows a prodigal use of timber, for the newels are 7½ inches square, and are continuous, but the turned posts on the top of each newel supporting the one above have been removed, the reason being, so it is said, that sacks of corn might be the more easily carried up and down; the solid strings are 14 inches by 7½ inches, and the hand-rails 6 inches by 6½ inches, with 3½-inch turned balusters. The eastern end of the ground floor originally formed one room. The house contains some good stone chimneypieces, and several of the rooms are panelled. A corner lobby or tambour in one of the bedrooms has an angle pilaster with an Ionic capping treated in a noble but curious manner, for in order to solve the difficulty of the angle volute it is omitted altogether. Close to the house on the east side is the church, so close that at the north-west corner it is only 3 feet off. It is a picturesque though diminutive building, with several traces of Norman work, notably the north doorway, which is now blocked up. It consists of a nave and chancel 12 feet wide, with a south aisle, and a further aisle or chapel on the same side as wide as the nave and separated from it by an arcade. A timber bell turret, with a shingled roof, is placed over the junction of the nave and chancel roofs. In the south aisle are placed three recumbent monumental effigies in stone, which probably date from the early part of the fourteenth century, and are believed to have been brought from another church in the neighbourhood when it was pulled down. The figures are about 7 feet long; one is of a lady, and the other two represent knights, each with their legs crossed; in each case the armorial bearings are the same, and are believed to be those of the Crupe family, who resided at Whittington until the middle of the fourteenth century. In the chancel wall is a fragment of a tomb bearing the same arms. Fragments of very early work and some tiles from the old chancel are carefully preserved in the church, which was restored in 1872. In the churchyard at the east end is the shaft of an old cross.

The church and house were originally surrounded by a moat, traces of which still exist, and on the north-east are some very picturesque farm buildings.

Leaving Whittington and turning to the left off the main road to Chipping Norton, about ten miles off is Upper Slaughter, a small village containing a fine old manor house and a church. The former is a most interesting building, mainly dating from the sixteenth century, but the basement is probably a couple of centuries earlier, and the two-storeyed porch is evidently a later addition. It was formerly the property of the Church, but at the dissolution of the monasteries it passed to the Slaughter family, who rebuilt it and occupied it for about 300 years. They probably derived their name from the place, which in Domesday Book is spelt Sclostre, and the original name of the village may possibly be connected with some bloody victory over the Britons. The house is situated on the edge of a hollow, there being a difference of about 9 feet between the level of the entrance courtyard and the basement: the house is L-shaped in plan, and the entrance front, which faces west, has four gables, the one above the porch being much smaller than the others, while the southern elevation, which has three gables, forms the arm of the L. The eastern or back elevation is perhaps the most picturesque, as the grouping and the design of the chimneys is particularly good. Internally there do not seem to have been any dividing walls, and evidently the house has been considerably altered at various times. In one of the rooms there is some good panelling and a fine stone chimneypiece. The house, which has recently been occupied as a farmhouse, is now being restored.

The church, which is close by, is an interesting structure of transitional Norman work, and consists of a nave, western tower, and a chancel, with a stone bell turret surmounting the gable at the east end of the nave. The tower, which is square on plan and somewhat squat, is embattled and has angle pinnacles, but the upper part is of a later date than the nave. On the south-east of the church is a group of small cottages recently restored by Mr. Lutyens. About two miles east of Upper Slaughter is a new house designed by Mr. Guy Dawber, called Netherswell Manor; it was originally built about five years ago, but it has recently been added to and, in fact, completely remodelled. The stables, farm buildings, kennels and engine-house, and the lay-out of the gardens and terraces have all been most carefully designed by the architect. The house is most beautifully situated and commands some fine views. At present, of course, everything looks rather new, but when our Association visits the same district in another fifteen years or so I am sure that this house, over which architect and client have been so much in sympathy, will form one of the most interesting visits on their programme.

(To be concluded.)

TESTS OF CAST IRON.*

THE very great variations in the tests which have been obtained from cast iron from time to time, and the differences of opinion which exist as to the best methods of testing, determined the author to make the comparative tests which form the subject-matter of this paper. These tests were all carried out in actual foundry practice, the metal used being taken chiefly from the ordinary cylinder mixtures, which remained over and above what was required for the tests used in the ordinary shop work. The object of the tests was in no way to secure the highest possible results, but, if possible, to arrive at the differences in results under varying working conditions.

The author wishes to state his appreciation of the work of T. Turner, W. R. Johnson, West, Keep, and Outerbridge on cast iron. Their results are all of much value in the intricate problems involved in the study of that material.

Tensile Tests.

Nine boxes were used for casting the twenty-four tensile test-bars and six transverse test-bars from the one ladle. The tensile bars numbered 1 to 3 were cast to a diameter of ⅞ inch, Nos. 4 to 6 to a diameter of ¾ inch, Nos. 7 to 9 to a diameter of ⅝ inch, and Nos. 10 to 12 to a diameter of ½ inch. The tensile bars from 13 to 24 inclusive were cast 1 inch diameter, and were machined down to the same diameter as Nos. 1 to 12, and the six transverse test-bars were then cast on edge at an angle of 22½°. Table I. shows the results of the tests obtained, which appear to indicate that the bars which have been machined give better results than those which have been tested as cast with the skin on. The results of the transverse and deflection tests are given later. Twelve tensile test-bars and four transverse test-bars were cast from the same ladle, duplicating tests Nos. 13 to 24, in order to confirm if there were any special diameter of the turned bars which gave the highest results, but from the second part of Table I. it would appear that the bars turned down to ⅝ inch to ½ inch show very little variation in the test per square inch. Five sets of bars—three tensiles and two transverse bars, each with the same percentage of silicon (the latter cast on edge at an angle of 22½°)—were cast from the same

* A paper by Mr. E. Adamson (Sheffield) read at the meeting of the Iron and Steel Institute.

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TABLE I.—*Tensile Tests. Varying Diameters as Cast and Turned.*

Numbers.		Analysis.							Diameter of Test-bars.		Tensiles.	
Skin on as Cast.	Turned.	T. C.	G. C.	C. C.	Si.	S.	P.	Mn.	As Cast.	Turned.	Average of each Diameter.	Mean over all Areas.
		Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Inch.	Inch.	Tons per Sq. In.	Tons per Sq. In.
1-3	...	3·56	2·98	0·58	1·53	0·11	1·19	0·90	$\frac{7}{8}$	...	12·32	...†
4-6	...	,,	,,	,,	,,	,,	,,	,,	$\frac{3}{4}$	...	12·76	...†
7-9	...	,,	,,	,,	,,	,,	,,	,,	$\frac{5}{8}$	...	12·11	...†
10-12	...	,,	,,	,,	,,	,,	,,	,,	$\frac{1}{2}$	...	13·69	12·72†
...	13-15	,,	,,	,,	,,	,,	,,	,,	...	$\frac{7}{8}$	Flaws.	...*†
...	16-18	,,	,,	,,	,,	,,	,,	,,	...	$\frac{3}{4}$	13·20	...†
...	19-21	,,	,,	,,	,,	,,	,,	,,	...	$\frac{5}{8}$	14·72	...†
...	22-24	,,	,,	,,	,,	,,	,,	,,	...	$\frac{1}{2}$	13·96	13·96†
		Duplicating Tests 13 *to* 24.										
...	40-42	3·54	2·96	0·58	1·30	0·077	0·59	0·68	...	$\frac{7}{8}$	13·69	...†
...	43-45	,,	,,	,,	,,	,,	,,	,,	...	$\frac{3}{4}$	15·62	...†
...	46-48	,,	,,	,,	,,	,,	,,	,,	...	$\frac{5}{8}$	15·59	...†
...	49-51	,,	,,	,,	,,	,,	,,	,,	...	$\frac{1}{2}$	15·38	15·07†

* Flaws in all bars. † From one ladle.

TABLE II.—*Tensiles with Increasing Silicons.*

Mark.	Analysis.							Actual Silicon added.	Diameter of Test-bar at Fracture.	Tensile Strength per Square Inch.		
	T. C.	G. C.	C. C.	Si.	S.	P.	Mn.				Tons.	Mean of Sound Bars.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Inch.			
16	3·56	2·98	0·58	1·53	0·11	1·19	0·90	None	$\frac{3}{4}$	Machined from 1 inch,	14·03	...
17	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	13·48*	...
18	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	...	13·75
28	3·57	3·04	0·53	1·67	0·106	1·20	0·85	0·14	,,	,, ,,	14·72	...
29	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	15·31	...
30	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	14·59	14·88
31	3·56	3·00	0·56	1·65	0·075	1·20	0·87	0·12	,,	,, ,,	15·38	...
32	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	...†	...
33	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	15·48	15·44
34	3·58	2·99	0·59	1·68	0·106	1·17	0·80	0·33	,,	,, ,,	15·22	...
35	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	14·54	...
36	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	...†	14·88
37	3·57	2·98	0·57	2·00	0·09	1·17	0·81	0·47	,,	,, ,,	...†	...
38	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	...	...
39	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	15·47	15·47
43	3·56	2·98	0·58	1·30	0·077	0·59	0·68	None	,,	,, ,,	15·67	...
44	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	15·58	...
45	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	14·74†	15·62
52	3·59	3·05	0·54	1·46	0·073	0·84	0·65	0·16	,,	,, ,,	14·28	...
53	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	14·42	...
54	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	15·03	14·57
55	3·56	3·02	0·54	1·72	0·072	0·78	0·66	0·42	,,	,, ,,	14·94	...
56	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	14·94	...
57	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	14·04	14·64
58	3·56	3·00	0·58	1·86	0·076	0·70	0·65	0·56	,,	,, ,,	13·97	...
59	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	13·78	...
60	,,	,,	,,	,,	,,	,,	,,	,,	,,	,, ,,	13·47	13·74

* Slight flaws. † Flaw.

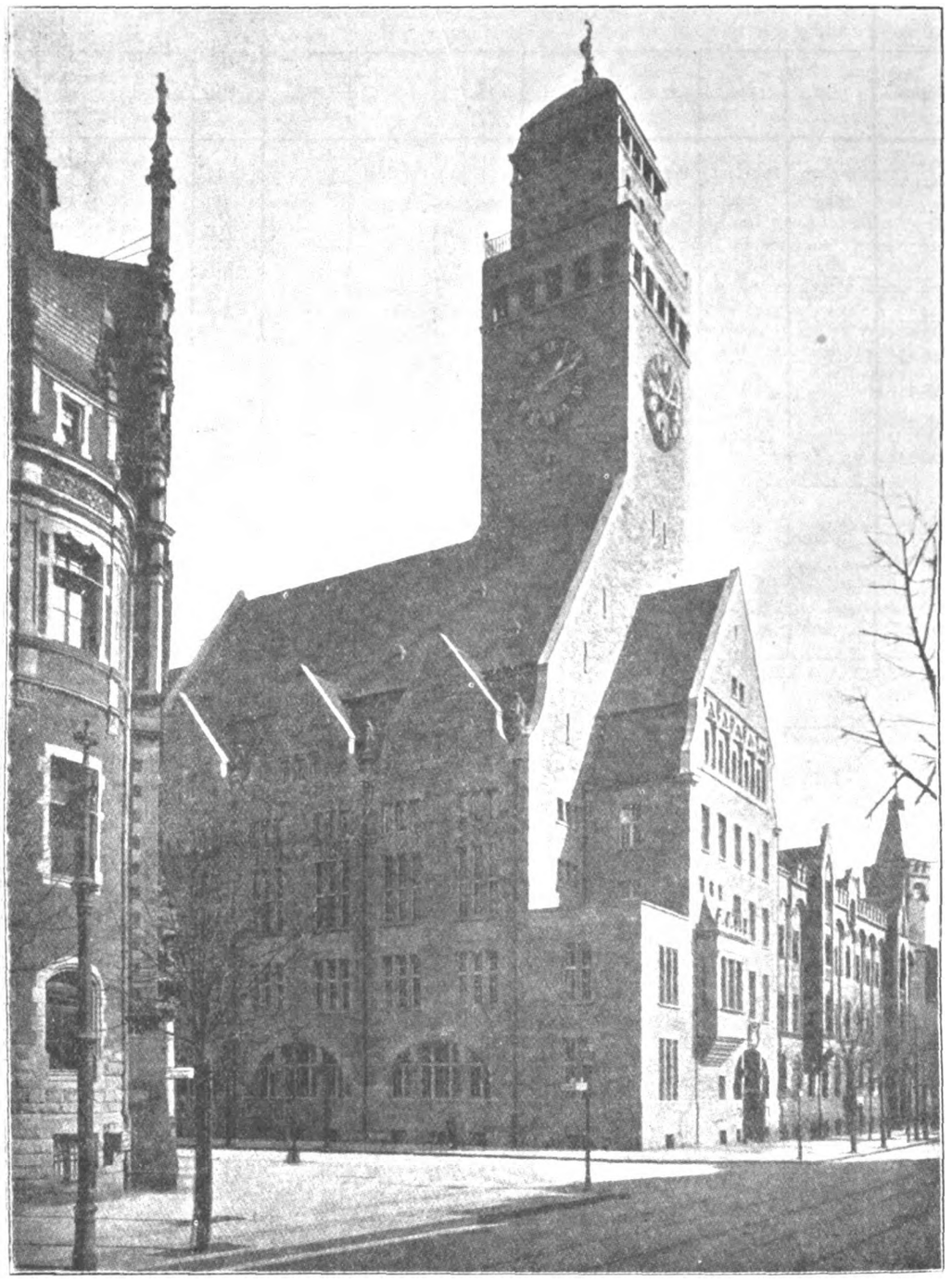
ladle of metal as those entered in Table I., but varying percentages of 50 per cent. ferro-silicon were added to each small ladle (taken from the larger ladle), in order to increase the percentages of silicon in the test-bars. This was duplicated.

Table II. shows the results of these tests, which were made with the idea of ascertaining the value of the use of high percentages of ferro-silicon in actual foundry practice. A number of the tensile tests showed flaws, and as the tests obtained therefrom were in consequence very low, they have not been included, as the true area of the bar could not be obtained. The sound bars were all tested, and the average results taken as the mean of each set of bars. In Table I. the percentages of silicon which were actually added to the metal are shown, together with the increasing percentages of silicon, and it is noticeable that in spite of the silicon being increased from 1.53 to 2 per cent. in the one case, and in the other from 1.3 to 1.86, the combined carbon shows practically no alteration. Further, as the other elements are practically constant, it may be assumed that this table shows the effect of increasing silicon, and whilst the first part of the table presents practically no difference in the average results from bars with from 1.67 to 2 per cent. of silicon, the second part shows a decrease in the strength as the silicon increases. This therefore, does not confirm the results contained in the first part of the table obtained with bars of varying silicon content, and would point to some condition of the iron, apart from the analyses, which has a greater effect on the results of the tests. Also from the fact that the percentage of combined carbon has not been reduced in spite of the addition of one-third more silicon, it would further show that silicon alone is not the only factor in the conversion of combined carbon to graphite. One point is very clear, namely, that with the increase of silicon the crystals of the iron have also increased in size; but these are also affected by the cooling conditions which are independent of the analysis.

(*To be concluded.*)

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



[From *Berliner Architekturwelt.*

NEW RATHAUS, RIXDORF. Reinhold Kiehl, Architect.

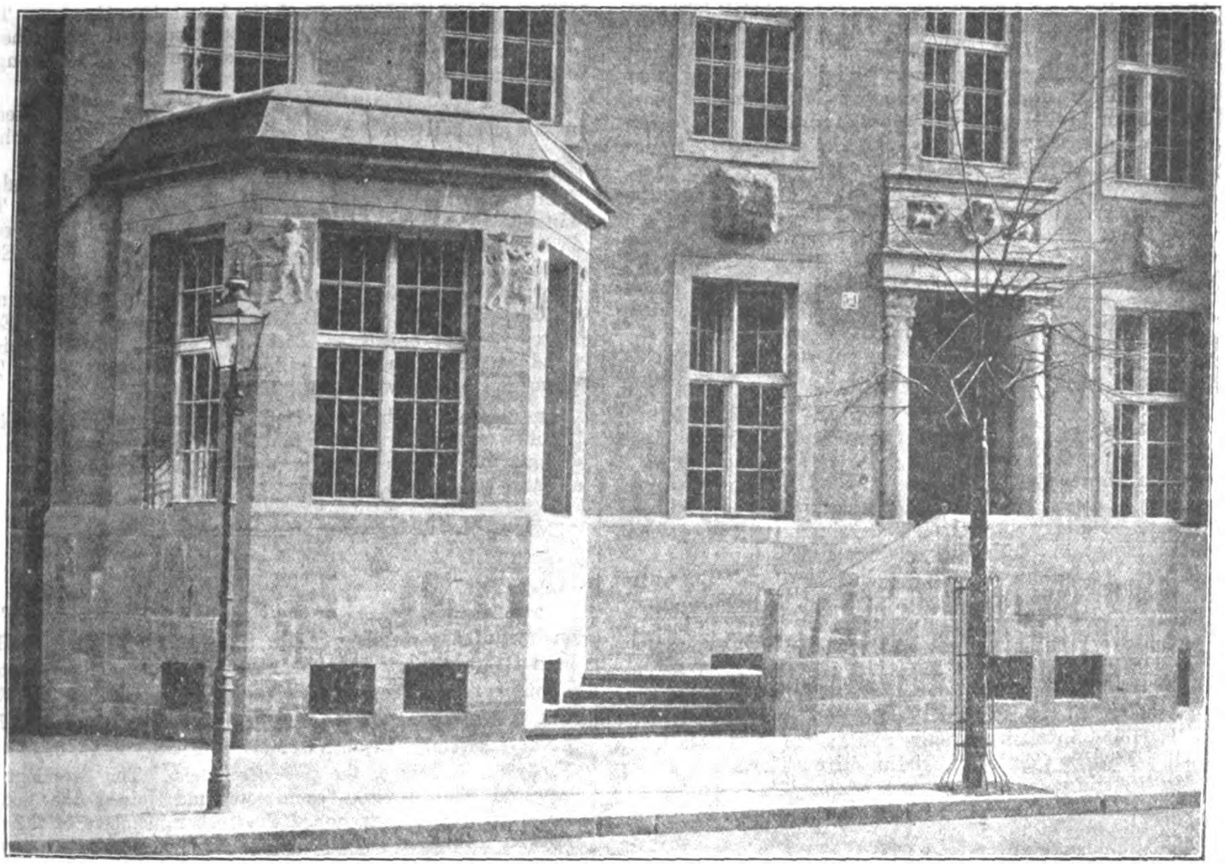
NOTES ON BOOKS.

"Cathedral Cities of Spain." Written and illustrated by W. W. Collins, R.I. (London: William Heinemann. 16*s.* net.)

THIS is the book of a painter, but of a painter who has a keen appreciation and an adequate knowledge of architecture, so that although it may be read and enjoyed by the layman, being not so severely technical as to be beyond his comprehension, and although it contains nothing in the way of plan, section, or elevation, it yet gives in the text such excellent word-painting of the architectural features, and in the illustrations, which, by the way, are all in colour, such admirable expression of detail as well as of composition, that it is eminently a book for an architect, who will have no difficulty in realising what is included in the Cathedral architecture of Spain. The severe majesty of the Romanesque work, the almost frivolous luxuriance of the latest Gothic in Europe are alike exhibited and portrayed by the artist-author. It is good for an architect to be able to see architecture, once in a while, through a painter's eyes. It makes him realise how great a part grouping and environment play, how potent is the influence of material along with and not neglecting that of detail in determining the expression of a building. One might expect that as a painter, Mr. Collins would, in his illustrations, put colour in the highest place, particularly in sunny Spain, where colour tells and brilliancy of tint harmonises so completely; but we feel in looking at the illustrations in this book that here we have the presentment of Architecture, that the cathedrals of Spain are not merely charming harmonies of colour, but that colour is but an adjunct to architectural form. Hence we may characterise Mr. Collins's drawings as admirable representations of architecture. And if for the moment we try to free our minds from this dominant impression we can enjoy without stint the feast of colour that is here provided, admir-

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



[From *Berliner Architekturwelt.*

DETAIL FROM NEW RATHAUS, RIXDORF. Reinhold Kiehl, Architect.

ably put before us by exquisitely skilful colour-printing of delightful paintings, sixty beautiful pictures for 16*s*.

"The Patent Road to Fortune." By a Successful Traveller on It. (Hull: Burtt Brothers. London: A. Brown & Sons, Ltd. 3*d*.)

An investment of threepence to learn how to become a millionaire seems profitable, and in this little manual the main points of patent procedure are clearly described, and, above all, the useful lesson is inculcated that "the inventor may be the hen that lays the golden egg: it is the capitalist and manufacturer who hatches it." It is easy enough to invent—an architect does it every day of his life—and not difficult to obtain a patent; but it is quite another thing to make a fortune out of a patent, which, after all, is but a peg on which to hang a business, and a successful business cannot be made without capital, energy and commercial instinct.

"Construction, Equipment and Management of a General Hospital." By Donald J. Mackintosh, M.B., M.V.O., Medical Superintendent of the Western Infirmary, Glasgow. (Edinburgh and Glasgow: William Hodge & Co. 10*s*. 6*d*. net.)

This appears to be practically an exposition of the details and methods adopted in the design and equipment of one of our most modern large hospitals, the Western Infirmary of Glasgow, and of the principles that have dictated these details and methods. Whilst, therefore, it represents the views of a medical practitioner of great experience in hospital work, it is almost necessarily a somewhat one-sided treatment of the subject, and lays down the law with great emphasis in regard to many points in hospital construction and equipment as to which there is justifiable difference of opinion. For example, the bathrooms of the ward units illustrated and described open direct into the corridor leading to the ward, close to the door of the ward and immediately facing the door of the ward kitchen, instead of being disconnected as are the w.c.'s and the sink rooms by a cross ventilated lobby. Many hospital men regard, and we think rightly, a lavatory or bath-waste pipe as quite as dangerous to health as a soil pipe. Again, Mr. Mackintosh enjoins, positively, the use of terrazzo for floors, even of an operating theatre, a point on which many experienced surgeons hold quite an opposite opinion. Whilst, therefore, this book gives us an admirable account of what has been done at Glasgow in regard to one General Hospital, it cannot be accepted as a text-book on the construction, equipment, and management of hospitals generally. We should not omit to note that there is included a description and plans of the Nurses' Home at the Hospital for Sick Children, Toronto, which the author describes as "probably the best-equipped Nurses' Home attached to any hospital."

"Building Construction." By Charles F. Mitchell, assisted by George A. Mitchell. Stages 2, 3 and Honours. (Advanced and Honours Courses.) Sixth Edition. (London; B. T. Batsford. 6*s*.)

Mitchell's Building Construction (Advanced), as it has been popularly known, has, since its first appearance, been universally recognised by teachers and students as excellent value for the money, and although the new edition is advanced in price, it is much enlarged and modernised, so that it is now better value than ever. There is, however, still room for improvement. The English natural cements should have been put into the past tense, and a warning given of practically the only natural cement now on the market, Belgian so-called "Portland cement." Fig. 3 would be more easily understood if it were not printed upside down. The weakest part of the book is still that on materials, and it is questionable whether it would not be wiser to omit it, as space does not permit adequate treatment. For example no up-to-date account would ignore Hungarian (Austrian) or Japanese oak, or Tabasco mahogany. The fire-resisting floors described are very antiquated, Fawcett's older form, for instance, being included, and his latest, and, as we think, best, omitted.

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"Shipping Marks on Timber." (London: William Rider & Son. 7*s.* 6*d.* net, in cloth; 9*s.* net., in leather.)

It would open the eyes of the architect who still specifies that all the timber required for his buildings shall be "from Memel, Danzig, or Riga," to glance through this book and note the multiplicity of ports and shippers that now send timber to this country, a multiplicity that renders it almost impossible for him even to remember the names, still less to know the marks by which they are distinguished. Hence such a book as this is an absolute necessity to every architect who really wants to know what his client is getting in the way of timber. The value of the book is enhanced by the dual or cross reference system of indexing the marks now used under shippers' names, and under marks alphabetically arranged. This volume should find its place on every architect's office book-shelf alongside of Laxton, the Building Act, and other works, for constant reference.

"Country Life." Vol. xxv. (London: George Newnes, Ltd.)

The half-yearly volumes of *Country Life* always make books of more than ephemeral interest well worthy of a place on a library shelf, if it were only for the valuable series of records of country homes, which has now for so long been a feature of the publication, and which, in the present volume, maintains both the interest and the standard of what has gone before. The houses described and illustrated in the present volume are Apethorpe Hall, Boughton House and Deene Park, in Northamptonshire; Blenheim Palace, in Oxfordshire; Brinsop Court and Holme Lacy, in Herefordshire; Charlton House, in Kent; Coker Court, in Somerset; Cooke's House, West Burton, and Wiston Park, in Sussex; Daneway House and Sudeley Castle, in Gloucestershire; Nevill Holt, in Leicestershire; Parham Old Hall, in Suffolk; Stirling Castle, in Stirlingshire; The Moot, Downton, in Wiltshire.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* gives a full account, with illustrations, including plans and details, of the steelwork of the Metropolitan Tower, the highest masonry and steel structure in the world, rising to 700 feet 3 inches above the kerb, and of which Messrs. N. Le Brun & Sons are the architects.

La Construction Moderne, in its series of articles on old Paris, now deals with the chapel of Port Royal and the church of Saint Médard. Illustrations are given of M. Gaston Castel's design for the principal (it would be royal if France were not a republic) box of a theatre, which took the Chaudesaignes Prize at the Académie des Beaux-Arts; of the executed façade premiated in 1908 by the municipality of Buenos Aires, and of a winning competition design for a block of offices for the Ministry of Marine, of which M. Palouillard-Demoriane, a former Prix-de-Rome man, is the author.

Architektur og Dekorativ Kunst has in recent issues given illustrations of the Arts and Crafts Exhibition buildings at Stockholm and of some of the exhibits therein. Several examples of cottage design are also illustrated.

Der Profanbau gives a full account of the work of Hans Grässel, the city architect of Munich, with illustrations of some of the works, especially orphanages and hospitals, that he has carried out. These are not merely utilitarian buildings, but works of architecture.

Architekten und Baumeister Zeitung illustrates another block of flats, of which Rudolf Erdös is the architect and which have been built in the Grüne Torgasse of Vienna.

The *Engineering Record* gives an account of some interesting tests on the waterproofing qualities of alum and soap mixed with concrete or cement mortar. These tests were made by Mr. B. L. Bowling in the cement laboratory of the University of Illinois.

The Leighton House Committee has arranged for Mr Beckwith A. Spencer to give a course of six lectures on "Florentine Painting" in Lord Leighton's studios, 12 Holland Park Road, Kensington, W., at 5 P.M. on successive Fridays, beginning October 29. The first will begin with the consideration of the "Conditions of art in Italy in the thirteenth century and in Greece in the Classic age compared."

COMPETITIONS.

Bath.—The City Council on Tuesday agreed to offer 50*l.* as a premium to the architect who submits the best competitive scheme for the improvement of the Institution Gardens. The Council have no intention of proceeding with any scheme immediately, but they desire to obtain an idea of what ought to be done with the site.

Hull.—Mr. J. W. Simpson, F.R.I.B.A., the assessor in the competition for a college for elementary teachers on the Cottingham Road, submitted his award to the Hull Higher Education Committee on Tuesday. There were seventy-nine architects who competed. The winners of the premiums were as follows:—1st, Messrs. Crouch, Butler & Savage, Birmingham (No. 53). Estimated cost of buildings, 33,350*l.* 2nd, Mr. William H. Thorpe, Leeds (No. 54). Estimated cost of buildings, 41.027*l.* 3rd, Mr. G. H. B. Gould, Ipswich (No. 55). Estimated cost of buildings, 36,207*l.* The committee decided to adopt the design of the winners of the first premium. The premiums offered were 150*l.*, 100*l.*, and 50*l.*

Rotherham.—The education committee last week decided to offer premiums of 50*l.* and 20*l.* in the competition for designs for a higher standard school at Kimberworth. An assessor will be appointed.

GENERAL.

The Annual Dinner of the Norwood Athenæum took place on Wednesday evening in the Caledonian Hall of the Holborn Restaurant. The chair was occupied by Mr. George Thatcher, the President, who was supported by the Rev. Canon Mapleson, I.L.D., Mr. F. Spiers (Secretary), and Mr. Frederick Higgs, the head of the well-known firm of Messrs. F. & H. F. Higgs, the past President. The President announced that several architects had joined the Society recently, and it was hoped that other members of the profession might be induced to follow their example. A very hearty vote of thanks was passed to those members who had read papers before the Society and conducted their Saturday afternoon visits to places of architectural interest.

The Foundation Stone of St. Mark's Church, Purley, was laid on October 23 by the Bishop of Kingston. The church is designed in the Decorated Gothic style. The nave is 25 feet 6 inches wide, 38 feet high and 83 feet long divided into five bays. The chancel is 24 feet 6 inches wide and 38 feet 6 inches long. There are north and south lean-to aisles, 10 feet 3 inches wide, and double transepts, that on the north side forming the nave to an apsidal ended chapel. The vestries are placed on the south side of the chancel, and the organ chamber is formed over the choir vestry. The tower is placed at the junction of the aisle and transept on the north side of the church, and has a copper covered spire rising to a height of 130 feet, the base of the tower forming the principal entrance to the church. The baptistery is placed at the west end, and is flanked on either side by entrance porches. The materials used are Kentish rag stone laid in random courses, with Bath stone dressings externally, and brick-facing with stone dressings internally. The church is being built by Messrs. R. Wilkins & Sons, of Bristol, from the designs of Mr. George H. Fellowes Prynne, F.R.I.B.A., of Westminster.

The Surveyors' Institution have awarded their gold meda for the best paper read at the professional meetings of the past session to Mr. J. G. Head (Fellow) for a paper on "Giant London."

Sir W. B. Richmond, R.A., is to deliver on Tuesday next and the three following days the set of Hermione Lectures annually given at Alexandra College, Dublin. The course will treat of Egyptian, Greek and Byzantine art.

The Court of Common Council in response to a letter from the Dean of St. Paul's asking for the assistance of the Corporation in raising the amount required for the necessary preventive measures to secure the cathedral against fire risks, have made a grant out of the City's cash of 200 guineas.

Mr. J. J. Webster, M.I.C.E., 39 Victoria Street, S.W., has been appointed by the Warrington Town Council to act as assessor in the competition for a new ferro-concrete bridge to be erected over the Mersey. Mr. Webster will also superintend the carrying out of the work. The Town Clerk has been instructed to apply to Parliament for a Bill giving powers to construct the bridge, which is to be 60 or 70 feet wide.

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The Architect.

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FORTHCOMING EVENTS.

Friday, November 5.

Architectural Association: Paper on "Drainage and Sewage Disposal," by Mr. W. D. Scott-Moncrieff.

Monday, November 8.

Surveyors' Institution: Presidential Address by Mr. Alexander R. Stenning, F.R.I.B.A.

Tuesday, November 9.

Institution of Civil Engineers: Papers on "The Single-Phase Electrification of the Heysham, Morecambe and Lancaster Branch of the Midland Railway," by Messrs. J. Dalziel and J. Savers; and on "The Equipment and Working Results of the Mersey Railway under Steam and Electric Traction," by Mr. J. Shaw.

Wednesday, November 10.

Manchester Society of Architects: Paper on "Practical and Theoretical Training," by Mr. R. W. Schultz.

Northern Architectural Association: Opening Address by the President, Mr. G. T. Brown, F.R.I.B.A.

Royal Sanitary Institute: Discussion on "The Quality of Effluents in Relation to Standards," to be opened by Mr. Gilbert J. Fowler, D.Sc., F.I.C.

COMPETITION DRAWINGS FOR TRAINING COLLEGE, HULL.

THE competition for the proposed college for the training of teachers for elementary schools to be built by the City of Hull Education Committee brought designs from seventy-nine architects, and a very considerable proportion of these designs are excellent; but the Education Committee started from false premises, and imagined that a properly equipped training college for 150 students could be built for something between 25,000*l.* and 30,000*l.*, and without giving competitors an idea of the sum they expected to spend, they had prepared for them a scheme and list of requirements of a truly formidable and comprehensive character, leaving it to the competing architects to say how much it would cost.

This was hardly fair on the competitors, who ought to have been told by the Committee, "We do not want to spend more than 30,000*l.*; give us the best you can for the money." Those competitors who watched the local papers, or otherwise got the information that 31,000*l.* was the assessor's estimate of what the college could be built for, or that the Committee's idea was nearer 25,000*l.*, tried to keep down to that figure. The conditions gave the hint that economy was desirable and that the buildings must be such as not to cost more than 7*d.* a foot cube; but we should like to see—and criticise—the design that Mr. SIMPSON, the assessor, would produce to give the accommodation demanded for 31,000*l.* at 7*d.* a foot cube. We think it could be done—by making most of the rooms 8 feet high, paring down the area of everything not stipulated to the barest possible figure, and using plenty of flat roofs. But the result would not be a first-class training college.

We have not examined all the seventy-nine reports, but we have looked at all those accompanying designs that we think are worthy of execution, and have come to the conclusion that of these the selected design is the cheapest possible; but we are sure that Messrs. CROUCH, BUTLER & SAVAGE must have had a hard struggle with their better feelings before they cut down as they have done their design to the form it now possesses, and they must also feel that if they could spend another 5,000*l.* or 10,000*l.* they could produce a training college more worthy of the city of Hull.

As in the particulars of the competition areas of rooms were not suggested save in a very few instances, it is in this direction that the designs principally vary. For example, the assembly or central hall in the winning design is 68 feet 3 inches by 30 feet, in the second premiated design 80 feet by 44 feet. Which is right? If the college is to be built for anything near the 31,000*l.* it is clear that the figures settled by Messrs. CROUCH, BUTLER & SAVAGE cannot be exceeded. Now, this hall is not for teaching 150 students, but for examining them as to their qualifications for filling posts as teachers, for doing their life's work. There is no competition in these examinations; they are not Civil Service examinations; it is the whole 150 students against the examiners, and it is vitally necessary to the efficiency of the college and the standard of teachers it sends out that there shall be no "cribbing" at the examinations. Now with the dimensions to which the inadequate expenditure limits the authors of the selected design no amount of "bull-dogs" will prevent cribbing, and we consider that the size of Mr. THORPE'S hall is the least that is permissible. But it can't be done for the money.

We think that Mr. SIMPSON, in advising the Education Committee, as he is reported to have done, that the college they ought to have can be built for 31,000*l.* has made a grievous mistake. If they want a cheap and inefficient college, certainly they can get it for the sum mentioned, but it will not be a model for other education authorities to follow. From the competitors' point of view, a great many clever men have wasted time and money because they were not told that the Education Committee of the City of Hull wanted a cheap article in preference to a good one.

The college will consist, according to the conditions, of various units—(A) hostel for 50 men students, (B) hostel for 100 women students, (C) hall and lecture rooms, (D) refectory and kitchens, (E) Principal's house, (F) gymnasium, (G) porter's lodge and entrance gates.

In the first premiated and selected design, by Messrs. CROUCH, BUTLER & SAVAGE, the principle has been adopted of arranging the various units in a series of separate blocks connected by covered ways. The whole are grouped very compactly in the southern part of the site, and thus leave a large area free for playing fields. In units A and B, the hostels for men and women respectively, the preparation room and recreation room, each 30 feet by 20 feet, and also the latrines and cloak room, boot-changing and cleaning rooms, and bicycle store are one storey buildings only, with flat roofs, thus simplifying the problem of providing the study-bedrooms and other accommodation in an easy and symmetrical manner. The difficulty in this connection presented by the isolation rooms for sickness is obviated by placing these on the third floor. Thus the hostels are three storeys high, with a fourth storey in parts. Practically all the study-bedrooms on the second floor are in the roof.

In unit C the central hall is 68 feet 3 inches by 30 feet, and on the ground floor has rooms all round it, the light being obtained over the art room, which is 20 feet by 50 feet, but only 12 feet high, and flanks the north side of the central hall. The authors have given rather more than was asked for as regards class-rooms, providing two for fifteen students instead of twelve as required by the instructions.

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ETCHINGHAM CHURCH, SUSSEX.—From a sketch by BANISTER FLETCHER.

The science class-rooms are on the first floor, where also are placed the common rooms for male and female staff, vice-principal, and master of method, and the sick-room. The greenhouse adjoins the chemistry laboratory, but is thus on a different floor and a long way from the art room.

Unit D is well and compactly planned, the refectory being the same size as the central hall, 68 feet 3 inches by 30 feet, but the lighting of this and of the servants' dormitories over does not seem to us to be quite as good as might be desired.

Unit E, the Principal's house, is economically planned, but the rooms are small, and two of the bedrooms are veritable attics in the roof.

In unit F the gymnasium is 50 feet by 20 feet, and with a verandah 8 feet wide forms the sports pavilion. The manual instruction room is 35 feet by 20 feet, and the changing rooms are each 13 feet 6 inches by 17 feet. The fives courts are of the Eton pattern.

The external treatment is a quite modern and severely restrained red brick building with stone dressings and green slate roofs. The authors' estimate at the figures suggested in the conditions is 33,350*l*., but they think their design could be carried out for 30,000*l*., and we agree with them, provided they are allowed to skin their specification as they have squeezed the accommodation.

The second premiated design, by Mr. WILLIAM H. THORPE, also adopts the principle of detached blocks connected by covered ways, but the blocks are larger on plan in themselves and are disposed so as to occupy more space on the site. In units A and B the hostels are three-storey buildings, and the preparation room and recreation room have study-bedrooms over them, thus necessitating a compromise on the ground floor between the desirable height of study-bedrooms and of the larger rooms. Whereas Messrs. CROUCH, BUTLER & SAVAGE make the height of the smaller rooms uniformly 9 feet 3 inches and that of the larger rooms 11 feet, Mr. THORPE has felt constrained to make the height of his ground floor 10 feet throughout. Apart from this, the space provided by Mr. THORPE for various parts is greater than that in the selected design. Coming to unit C, the hall and lecture rooms, we think Mr. THORPE's plan is markedly superior to that of the selected design, even though the art room has windows on the east side and one at the south end in addition to the principal windows at the north end. The relative amount of space provided may be gleaned from the dimensions of Mr. THORPE's central hall, 80 feet by 44 feet, and the remainder of the accommodation is on a similar scale. In unit D we find the same story. Mr. THORPE's dining-hall is 74 feet 6 inches by 32 feet; his kitchen 30 feet by 20 feet, as against 20 feet by 20 feet in the selected design; in fact, throughout, Mr. THORPE's plan for this unit is better than that of the victors, but more expensive. So also with unit E, the Principal's house. In unit F, the gymnasium and sports pavilion, we do not think that Mr. THORPE's plan is superior, although it gives more accommodation and is, therefore, more expensive. Mr. THORPE proposed to carry out his design in red brick, with Ancaster stone dressings and grey Burlington slates. His external treatment is, we think, more dignified and suitable than that of the selected design. In fact, we may very well presume that, if cost were not a vital element in the decision, the position of the first and second premiated designs would have been reversed. Mr. THORPE estimates the cost of his design at 7*d*. per foot cube at 42,647*l*., but thinks it could be brought down to 35,207*l*. We think many of the competitors have misread the assessor's instructions on the point of price. We understand him to mean, "You must not make a design that will cost more than 7*d*. a foot cube," not "You must price your design at 7*d*." At Grimsby, we remember, some of the competitors were going to build for 4*d*., and Grimsby is not far from Hull.

The third premiated design, by Mr. G. H. B. GOULD, differs somewhat in type from the first and second in that the hostels immediately adjoin the refectory block, and the only corridors or covered ways are those to the assembly hall and lecture rooms. There is a nice sense of effective internal planning and a largeness of treatment with generosity of space that makes this plan very attractive, and without undue expense a quite collegiate feeling is given to the external treatment by a Tudoresque cachet. The author estimates the cost of his design at 36,207*l*., but he has cubed units A, B, and E at 6½*d*., units C, D, and G at 6*d*., and unit F and covered ways at 5*d*., instead of the figures adopted by the authors of the first and second premiated designs. This figure should therefore be com-

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pared with the first at 30,000*l.* and the second at 35,207*l.* There is not the slightest doubt in our mind that, putting on one side the question of cost for the moment, both the second and third premiated designs are superior to that selected; but, on the other hand, there is not another design in the room which at 30,000*l.*, or something near it, is equal to that of Messrs. CROUCH, BUTLER & SAVAGE. We are quite aware that it may be said with truth that students in this training college are not of the same class as undergraduates at Oxford or Cambridge, that they will become school-teachers at quite moderate salaries, and ought not to be led in their college life to become accustomed to luxuries that will be beyond their reach when they leave "coll." Our answer to this is that the scheme as outlined in the competition conditions embraces many features that might be omitted; and, therefore, to keep within the mark, adequate provision for necessaries is cut down. We fancy that we could take Mr. THORPE's or Mr. GOULD's plan, and by omitting superfluities leave the necessaries as ample as they have provided them without exceeding the expenditure of 25,000*l.*

Of the designs that have not obtained a premium, there are many that are worthy of notice. No. 50 is a very good design, and cubes out at 32,461*l.* No. 62 is also very good with the preparation and recreation rooms of one storey only, but the price, 45,855*l.*, is prohibitive, and as the group of buildings is rather wide it is set somewhat far back on the site and thus reduces the size of the playing fields. Another very good design, which also occupies rather a large proportion of the site, is No. 13; and here again 41,273*l.* puts it out of the running. Very fine designs are No. 17 and No. 20, but their cost would be 49,567*l.* and 54,222*l.* respectively.

Some of the competitors have gone in for big towers, and generally these are part of good, though expensive, designs, amongst them being No. 2 at 45,405*l.*, No. 4 at 49,062*l.*, and No. 25 at 43,294*l.* Pretty grouping of the various units on the block plan is the point to which others of the competitors have directed their attention, such as No. 21, No. 33, No. 49, and No. 63, the latter being quite a good design with preparation and recreation rooms, one storey only, and estimated at 37,120*l.*, but marred by a kitchen department in the basement, which for this particular site was a thing to be avoided. Of the remaining designs which we noted as in one way or other showing excellence are Nos. 9, 14, 15, 18, 19, 22, 23, 24, 26, 27, 40, 56, 57, 65, 68, and 70. Thus more than one-third of the designs exhibited are, barring the question of cost, quite worthy of erection, so that the city of Hull may feel certain that its invitation to compete has met with a very good response from capable architects.

PERMITS TO PHOTOGRAPH.

THE article which appeared in the *Times* on this subject brought a letter from the Dean of PETERBOROUGH, pointing out that the information given in the article was incorrect as regarded his cathedral at least. We have, therefore, made special inquiries as to the regulations regarding permission to photograph, sketch, or measure in our cathedrals, and the following particulars may be taken as authentic:—

BRISTOL.—Permits to photograph and sketch given by the Dean. No charge.

CARLISLE.—Permits to photograph, sketch, or measure given by the Dean "on certain necessary conditions."

CHESTER.—Permits to photograph or sketch at the discretion of the Dean on written application, with name and address. No charge except sixpence for entry to choir or lady chapel.

CHICHESTER.—Permission to photograph, sketch, or measure to be obtained from the Dean and Chapter on application to the Chapter Clerk and payment of half-a-crown. A copy of every photograph taken to be sent to the Chapter Clerk.

DURHAM.—Permits to photograph, measure, or draw given by the Dean. No charge.

ELY.—Permission to photograph, sketch, or measure granted to proper applicants for such parts of the Cathedral and precincts as are ordinarily accessible to visitors. Application to be made to the Dean or the Canon in residence. No charge at present, but question of a moderate fee is under consideration.

EXETER.—Permits to photograph, sketch, or measure given by the Dean or Canon in residence, under certain regulations which the verger communicates. No charge.

LICHFIELD.—Permits to photograph, sketch, or measure can be obtained on application to the Canon in residence. The use of ladders not allowed, nor the removal of any article of furniture. Regulations now under consideration by the Dean and Chapter, and may possibly be revised.

LINCOLN.—Permits to photograph, sketch, and measure granted for four weeks, and if elsewhere than in the nave for a single payment of sixpence. Special permission required for the higher storeys, and applicant must be accompanied by a workman of the cathedral, for whose time a fee will be charged.

MANCHESTER.—Photographing not allowed. Permits granted for sketching or rubbing brasses on payment of a small fee. Photographs can be bought at a cheap rate, the Dean and Chapter having employed a professional firm "to make a series of beautiful photographs, bringing out all that is best to be seen in the cathedral."

NEWCASTLE-ON-TYNE.—Permission for photographing or sketching to be obtained from the Vicar or the Canon in residence.

OXFORD.—Permission to photograph, sketch, or measure must be obtained from the Dean, or, in his absence, from the Canon in residence.

PETERBOROUGH.—Permits are not required, "except that in the case of elaborate measurements, involving perhaps extra labour or responsibility on the part of the vergers, it might be necessary to make special arrangements."

ROCHESTER.—Permits to photograph, sketch, or measure granted by the Dean on written or personal application. A fee of sixpence charged, unless a series of visits is contemplated, when the fee is somewhat modified.

ST. ALBANS.—Permits granted by the Dean, name and address of applicant being required. No fee charged. Holder must "conform to the necessary regulations."

ST. ASAPH.—Permission to photograph and sketch granted by the Dean on application. No charge.

ST. DAVIDS.—Permits for photographing or sketching are granted by the Dean. Fee for one day, one shilling; for one week, half-a-crown. Permission to take measurements is very rarely asked for, and would involve special consideration.

ST. PAUL'S.—Fee of half-a-crown charged for each day's leave to photograph (except in special cases). No flash-light allowed.

SALISBURY.—Permission to photograph, sketch, or measure given to all by the Dean or Canon in residence on application.

SOUTHWARK.—Tickets of permission to photograph, sketch, &c., are obtainable of the Dean's verger at five shillings each.

TRURO.—Permission to photograph given on application, usually by letter, to the Canon in residence. Fee of half-a-crown charged.

WELLS.—Permission given on written application to the Dean or Canon in residence for photographing or sketching, and (in the case of architects) for measuring, without any charge up to the present; but it is not improbable that a small charge may be soon made.

WESTMINSTER ABBEY.—Permission to take photographs is only granted by the Dean in exceptional cases on application to the Chapter Clerk. A fee is paid to the Fabric Fund of five shillings for each view or object photographed within the church.

WINCHESTER.—Permission to sketch or take measurements given on application without charge. Photographers are charged one shilling a day, or half-a-crown a week.

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WORCESTER.—Permission to photograph given on application to the Dean or Canon in residence. The use of ladders or other apparatus of that kind would be specially considered as to its reasonability.

YORK.—On application to the Chapter Clerk a permit to photograph is given on payment of fee of half-a-crown for one day; to sketch, measure, or take a rubbing, one shilling. For a period of several days or weeks on special work, special terms are arranged for those who can produce satisfactory references. For the choir, lady chapel, chapter-house, crypt, or any part shut off by gates, an additional charge is made of sixpence. The crypts are electrically lighted, and a small extra is charged for this sometimes. Access to the triforium and the use of ladders and stands allowed only under supervision by the clerk of works.

It is hardly necessary to say that photographing, sketching, and measuring are not allowed in cathedrals on Sunday or during Divine Service, that artificial light is usually forbidden, and the use of ladders or stands or the moving of any article of furniture are only allowed by special permission and under the personal supervision of the clerk of works or other official. It will be gathered from the detailed particulars we give above that great freedom is allowed in our cathedrals to those who wish to study; that the regulations made and the fees charged, where these are in force, are for the purpose of maintaining the decency of the church and of preventing the abuse of the privileges that are granted.

NOTES AND COMMENTS.

THE opinions of counsel which have been obtained by the action of 83 architects who took part in the Middlesbrough Library Competition, and who were grievously dissatisfied with the award of Mr. J. S. GIBSON on the ground that the successful competitors violated the conditions of the competition, may be taken to determine two distinct questions:—First, that, in the opinion of a learned counsel accustomed to weigh carefully the exact meaning of words and sentences, the conditions of the competition were not violated in any important point; second, that even if they had been so violated, the competitors would have had no redress or appeal from the decision of the assessor.

MR. BRACKENBURY'S advice, we think, is thoroughly sound: that the conditions and instructions of competitions ought to be so carefully and completely prepared and worded that there should be no necessity for supplementary replies to questions. We fear, however, that it will be a very long time before such an ideal set of conditions and instructions is furnished in any British competition.

THAT competitors should have no legal redress in the event of a faulty award by an assessor has always to us appeared to be an unanswerable argument in favour of the adoption of the jury system of deciding competitions, as universally followed on the Continent. This is not the first time that an assessor has been supposed to make a faulty award, and with even greater and less doubtful grounds than at Middlesbrough. We are not prepared to say that the jury system always results in a correct award, but there is the eminent probability that such will result from the combined wisdom of a number of judges.

THE jury system, for obvious reasons, makes slow progress in favour in this country, particularly amongst those from whom our assessors are chosen. It seems, therefore, that the only course now open to those architects who take part in competitions is, first of all, to protest against the nomination by the President of the Royal Institute of any architect as assessor whom they cannot trust to make a correct award; second, to insist on the name of the assessor being announced before the drawings are prepared; and, third, to abstain from competing when they cannot feel that justice will be done by the particular assessor appointed.

THE discussion on the authorship of the wax bust recently purchased for the Kaiser Friedrich Museum by Dr. BODE is a highly amusing commentary on the value of "old masters." If the bust is by LEONARDO DA VINCI it is supposed to be cheap at 8,000*l*. If it is the work of Mr. R. C. LUCAS it is not worth as many pence. Yet it is as much a consummate work of art in one case as in the other. R. C. LUCAS was undoubtedly a man of great ability, we may even say genius, but it was unrecognised genius, unrecognised, that is to say, by the dealers, save his employer BUCHANAN. There is no probability of there being a replica of this bust if it is the work of LUCAS any more than if it be that of LEONARDO. LUCAS'S works are probably not more numerous than DA VINCI'S. Thus the whole value of this bust lies not in its intrinsic merit, but in the accident that it is thought by some to be the work of one man rather than of another, and that the presumed author is an artist whom the dealers have thought worthy of booming.

THE General Purposes Committee of the London County Council have come to a decision to recommend that the separate existence of an architectural department for education shall cease on the retirement of Mr. T. J. BAILEY at the end of this year, and that as from January 1, 1910, the educational architectural work be placed under the charge of the architect, and that the staff of the department of the architect (education) be transferred on that date to the department of the architect. The meaning of all this is, we take it, that the Council is very well satisfied with the work of Mr. RILEY as chief of its architectural staff, and that his system of organisation and control is a satisfactory one. Although some sections of the architect's department have less to do now than formerly, it cannot be supposed that Mr. RILEY personally has not quite enough to do without being bothered about schools, but his employers evidently think that he is the man to see that some one else builds schools properly. We congratulate Mr. RILEY.

PAGEANTS do some good beyond their ephemeral teaching of history when the profits are devoted to permanent objects, and the course adopted at Liverpool of devoting the balance from their successful pageant to the pictorial embellishment of the town hall is one that is worthy to be followed. The decorative paintings by Mr. AMSCHEWITZ are now ready, and will shortly be placed in position.

WE have received an interesting appeal from the Rev. CHARLES E. LAING, vicar of Bardney, Lincoln, for funds to complete the excavations of the great Benedictine Abbey of St. Peter, St. Paul and St. Oswald. The church is 254 feet long and 61 feet 6 inches wide, with north transept and two side chapels forming a south transept. The chancel was entirely Norman and had four bays; the nave appears from the photographs of the bases of piers to have been Early English and had nine bays. Six only of the piers have as yet been uncovered. The site of the monastic buildings appears to be well defined, but work on their excavation has only just begun.

KINGSTON Bridge is one of the few over the Thames that can be considered beautiful or even sightly, and it is therefore disquieting to know that Mr. BASIL MOTT in his report to the joint committee of the County Councils of Surrey and Middlesex, whilst estimating the cost of widening at 62,000*l*., expresses the opinion that "any attempt to widen must be accompanied by considerable risk to the existing structure," and advocates the building of a new bridge of three elliptical arches of Cornish granite and blue Staffordshire brick, to cost 111,250*l*. Mr. MOTT suggests as an alternative that the present bridge might be left and a new one of less expensive character be erected nearer the railway bridge, and this we think the best of his alternative suggestions.

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ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE opening meeting of the session of the Royal Institute of British Architects was held on Monday evening last at Conduit Street, W., Mr. Ernest George (President) in the chair.

Mr. H. T. HARE announced the decease of the following members:—Nathan Solomon Joseph, Associate 1863, Fellow 1890; Frederick Hyde Pownall, Associate 1857, Fellow 1860; Henry Stock, Fellow 1885; Don Jose Urioste, of Velada, Hon. Corresponding Member, Madrid, elected 1905; Frederick H. Williams, Associate 1878; John Wornham Penfold, Associate 1860, Fellow 1881; John Archibald Campbell, Fellow 1906; William Owen, Associate 1879; Auguste Choisy, Hon. Corresponding Member and Royal Gold Medallist 1904; and Charles Follen McKim, Hon. Corresponding Member and Royal Gold Medallist 1903.

The SECRETARY said two candidates had passed the recent statutory examination held by the Institute under the London Building Act, Mr. Baxter Greig and Mr. John Hatton Markham, and they had been awarded by the Council a certificate of competency to act as district surveyors in London. Mr. Reginald Guy Kirkby had been awarded a certificate of competency to act as building surveyor under the local authorities

President's Address.

The PRESIDENT then delivered the opening address. He said:—We meet to-night at the opening of the seventy-fifth session of our Royal Institute, and it has been the custom on such first nights for the President to make his oration, and you listened with courteous patience a year ago to my expression of sentiments and views about architecture and the concerns of our calling. My words to-night shall be few, for, happily, we have a more distinct interest in gathering here, perhaps overcrowding our room. Our numbers and our needs have outgrown the accommodation. It is a satisfaction to be able to state that after a few months we shall be suitably housed, spreading into the adjoining galleries that we have long coveted and in which will be our lecture theatre. This library will no longer be deranged for sessional meetings. The pictures, our precious possessions, which are now skied and which are deteriorating in the upper region of exhausted air, will be hung in a becoming light, doing justice to their distinguished painters and to our past Presidents. Our collection will shortly be made richer by the fine portrait of our late President from the hands of Mr. Cope. We shall be able to receive our guests with comfort and propriety without the present struggle for tea and toast. Also we shall have room for the exhibition, under our own roof, of the studentship drawings and of other collections that may be desirable from time to time.

In our art we do not make history so rapidly that there is a new story to be told each year. Progress, I believe, is steadily making—the result of sound training in our schools and of a truer appreciation among ourselves of the principles of building and design. There is a growing desire for breadth and largeness of treatment rather than for petty detail and the trivialities that once interested architects and their public.

We must report l'Art Nouveau as already in a moribund state, and happily we have not been startled by a later invention. We are seldom asked now why architects do not originate a style. Those who have followed the history of the art know that each style, seeming distinct, has been the result of growth, changes coming by degrees, sometimes by assimilation of foreign forms, as well as in variations of detail at the hands of the cunning craftsman, who yet held to the traditions in which he moved.

Such changes have at times been accelerated, as when the influence of the revived Greek and Roman art spread through northern Europe, and men of genius made new melodies on the old chords. Yet the giants of those days did not claim to have invented styles. To meet constantly changing requirements and to accept new methods of building, evolving new modes of treatment will give vitality to modern work which must not resuscitate old models. I give my humble opinion that the average work of architects now is better than it was even several years back, one advantage being that there is less diversity and a more general acceptance of a common style. There is the desire to fall into line rather than for strong self-assertion. Forty years ago, if we had a street frontage to deal with, a first thought was "Shall it be Gothic or Classic?" Now the feeling is that it should harmonise with its surroundings; better than the latter if possible, but not with a clash or discord.

For the carrying out of our work we have in this country admirable builders, and I am glad to state my experience in this matter. We have also the British workman, who is often spoken of slightingly, and perhaps with justice when known only through the demagogues who are too often his mouthpiece. We have craftsmen and workmen equal to the best. For these to have any independence and strength it was found necessary to combine and form unions, and these have been helpful in preserving the man's rights. We have, however, to lament the short-sighted policy of these unions in suppressing the individuality and self-reliance of the man. The intelligent mechanic, with skill and energy, must receive no higher wage than the wastrel; he must not work an hour longer, nor must he do more work in the hour. He is robbed of all ambition and of the possibility of improving his status. Our politicians on both sides of the House avoid this home truth, and discuss other ways of making our workers compete with skilled and industrious toilers in other countries. They do not say that the law the man makes for himself stultifies him and excludes him from the labour market. These artificial conditions of labour have also made the housing of the working man almost impossibly costly.

The future of our art is in the hands of the young men now in our offices, or in the good schools where a training is given much more thorough than could be had a generation ago. We are able to take stock of these future architects annually at the gathering of students' drawings in competition for our medals and prizes. The work shown last winter perhaps exceeded in quantity and quality the product of previous years.

An effort is being made to give direction to the studies of those who go out with our awards, so that time may be spent to the best advantage among the great examples; precious time has sometimes been wasted in miscellaneous and objectless sketching for want of a defined purpose in travel.

One of the aims that we have before us is the founding of a British Architectural School of Rome, the presentation to which would be our highest academic prize, and I am glad to say that this scheme has ceased to be in the clouds. Time and thought have been given to the subject, and much information gathered. A special committee has struggled with the problem, and our able friend Mr. John Simpson has drawn up a practical working basis for our consideration.

It has further been proposed by Sir Brumwell Thomas that we should have a "Diploma School"—a school where architectural study would be carried further than in the ordinary course of training or apprenticeship, and on men from this higher grade our "Prix de Rome" would be conferred; this would be equivalent to a prize Fellowship, giving leisure for higher culture.

It has but lately been realised how important is the study of civic design and town planning. It does not fall to our lot in the old country to scheme new cities on noble lines. We have, nevertheless, most of us seen familiar places change their aspect by degrees, often with lamentable result. There is now a general desire that new quarters of the town and new streets shall not come haphazard and by accident, but shall be the result of forethought, and part of a comprehensive plan with consideration of possible future needs. Architectural effect is to be studied as well as convenience and economy.

These matters have been till now left to surveyors and engineers. The study of such important problems will in future be brought before our architectural students, and, by the generosity of Mr. Lever, the Liverpool University is the first to enjoy a professorial chair for this special study.

A group of able men among our Institute members form a committee for the study and elucidation of this subject, and we have had the advantage of addresses here and of essays in our journal and elsewhere giving the results of their research. This committee is also considering the proposal to organise a conference of those interested in the work of town planning.

We are glad to realise that something has been done to reform suburban life from its monotonous environment. "Port Sunlight" perhaps was the earliest effort to supersede the usual rows of machine-made workmen's dwellings by groups of cottages with character and individuality, these having their outlook on a garden or green instead of always on the street.

The Garden Suburb at Golder's Green, Hampstead, is another happy growth on somewhat similar lines. It has been laid out with skill and judgment, the several roads or vistas taking advantage of any points of interest in the view. Ugly "backs" are avoided, the cottages being made seemly all round. There are dwellings for workmen, also accommodation suited to clerks, while there are larger houses for those of larger means. The desire has been to avoid an unrelieved and dreary aggregation of one class.

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Another oasis, in a district with no natural attraction, is formed by a gathering of suburban villas, built by Mr. Willett, to the north of Regent's Park. These are by various architects, and they are happily grouped in relation one to another; instead of fences their forecourts or front gardens are enclosed by neatly clipped yew hedges, outside which is a well-shorn grass margin to the road, and this is not harmed by traffic or the passer-by. Looking from these houses or at them the aspect is pleasant with an air of the country and of Kate Greenaway; we wish every success to such speculative building.

We have seen changes come, mostly for the better, in our own great city, while probably greater alterations must follow. Let us prepare for these.

Between the City and Southwark is to be a new "St. Paul's Bridge." This is a matter of vital interest, and we trust that with collective wisdom and good judgment we may have a fine architectural feature, with well studied approaches. Is there any reason why a Thames bridge built now should have less dignity and propriety than London Bridge and Waterloo Bridge? Is there not a shoddy and commercial appearance about most of the later attempts to span the river—a lack of monumental fitness? The bridges of a great city are the features that most impress the mind and remain on the memory.

While speaking of the City I would refer to the Guildhall, with its record reaching back to the days of Henry IV. The interesting crypt and the masonry of the walls remains, but generations of pottering have left little else. Even the late front by Dance has been mutilated. To meet modern wants great changes and rearrangements are to be made shortly, and we trust the best advice and the best possible scheme will be secured for this work. There is also a minor project for building kitchens, &c., now, to the disfigurement of the building, without reference to the future scheme. We would beg the Corporation to defer this work until they have decided on a comprehensive plan. Such halls are of national —I might say international—interest considering their wide hospitality. Some of my friends here will remember how the Burgomaster of Vienna last year, at the Architectural Congress, feasted a thousand of us in the Great Hall of the Rathaus.

In England we get fewer opportunities for architecture on a grand scale than is afforded in other countries. With our Continental neighbours a provincial railway station is made an occasion for an architectural feature; with us we demand only a restricted amount of accommodation and of convenience. The work of a post office is carried on perhaps in half of a grocer's shop, while in a French town the Bureau de Postes would house its officials in a structure with some magnificence.

Just now interest is taken in a scheme for a Playhouse as a fitting memorial to our great dramatist. I hope this may be realised on a dignified scale.

It is strange that while music and musicians have encouraging support here we cannot have an Opera House adequate to our important city. It is not in us to emulate Paris with its Place de l'Opéra, where architects, sculptors, and painters have enjoyed a free hand. Here the State is not expected to help in embellishments of the capital. Great demands are made upon her just now, but the desire is rather that she should take a grandmotherly interest in our private and domestic affairs.

We must accept the fact that expenditure on Art and objects of beauty must generally be the result of private munificence, and it has been gratifying to see how large sums have been forthcoming when a picture has had to be secured for the nation. In time we may find that architecture is appreciated as one of the great factors influencing the lives of the people. The cost of five Old Masters (at the present artificially inflated state of the market) would provide a noble building in which Drama or the Muse should be housed, receiving tributes from sculptor and painter. I do not undervalue the great works of great men, but I do feel that they are sometimes secured at an exaggerated cost, while the cheapening process is applied to public buildings and works that might have an exalting influence. The latter are the common property of all and belong to the poorest among us; they are possessions which we all enjoy and which cannot be catalogued in the impending Domesday Book.

Many of you may feel, as I do, the call from time to time to see something beautiful; perhaps, with a few days' leisure, to look upon the marble palaces and shrines of Venice. Entering St. Mark's we exult in the tenderness, the mystery, and the richness of that temple. As we see the poor crowding around, whose shoulders and knees have polished the stones, we may almost envy them having this constant possession. My argument is that fine architecture is the least selfish or "classy" of human products: it is for all sorts and conditions of men.

We often hear the complaint that architecture is not duly represented in the one small room allotted to it at Burlington House; but we are now, I hope, to be given our chance. We have proposed to the Council of the Royal Academy the arrangement in the winter months of an exhibition of Architecture and the contributory Arts. The Council has graciously entertained the idea of such a scheme for the winter of next year. It behoves us all to make strenuous efforts for a gathering of works and objects that shall interest the outside world in our art.

Besides perspective views, commonly seen, it is desired to have models, such portions of buildings as are portable, sculptured panels, decorative paintings, and, perhaps, metal gates or grilles, with detail drawings or photographs showing the relation of these works to their respective buildings.

The work of giving a higher organisation to the profession of Architecture through the medium of the Royal Institute is making steady progress. Two and a half years ago we adopted a comprehensive policy by a unanimous vote. Step by step we are carrying out that policy. We have drawn up and obtained the Royal sanction to a new Charter. We have drawn up new by-laws after a minute and exhausting discussion, and they are now awaiting the approval of the Privy Council. By the beginning of next year we hope to receive this approval, which will empower us to open the gates of the Institute for the space of one year for the admission of the large number of practising architects of good standing who are still unattached to our body. When that has been done with success we may claim that we represent practically the whole of the architectural profession in this country; we are then to ask Parliament for higher powers and a more secure position. It is our hope that the energies and the good will of all will be united to carry through this policy to ultimate success.

Presentation of the Royal Gold Medal to Dr. Arthur Evans.

While most of us are occupied with our personal aims and interests, seeking our own profit or advancement, with some consideration for the greatness of our Art and perhaps equal consideration for the necessary daily bread, there is among us a small band of workers moving on a higher plane, men who have set themselves to increase the sum of human knowledge. Some of these are engrossed in science, discovering ameliorations to sickness and pain. Some are exploring the desert and the mountain and charting unknown regions and increasing man's resources; while other brave men face the hardships of ice, storm, and starvation and fight their way to the Poles. All these explorers we delight to honour.

But to us the Poles have no professional attraction: we shall not be called upon to house the surplus population and the unemployed in those regions. The inhabited world and a knowledge of past civilisations have for us a much deeper interest, and we owe a great debt to those keen sportsmen who have set themselves to discover the relics of past races, unearthing buried cities, their temples and palaces, deciphering records and showing us how men have lived and fought and built.

To such work our distinguished visitor, Dr. Arthur Evans, has devoted his mind, his time, and his means, with the splendid result of reclaiming from oblivion the long-hidden treasures of Crete.

It is our privilege periodically to recommend for His Majesty's approval a name for the distinction of the Royal gold medal. It is for one who by building, by writing, or by research has advanced the art of Architecture. The first explorer to receive this mark of appreciation was the great pioneer of excavation, Sir Henry Layard, whose winged bulls, so prominent a feature in the British Museum, may be found some day to have relation to the Bulls of Knossos which Dr. Evans describes.

At a later date we had the honour of conferring the medal upon Dr. Schliemann, whose splendid tenacity of purpose resulted in the discovery of Troy and of Mycenæ, with the tomb of Agamemnon.

It is my pleasant duty to-day, in your names, to present the King's gold medal to Dr. Arthur Evans, who, in discovering the Palace of Minos, has, it is no exaggeration to say, completely revolutionised our accepted ideas of the early civilisations surrounding the Mediterranean basin. He has converted myth into history and floating prehistoric tradition into established fact.

But what is of paramount interest to us, he has shown that centuries before the Parthenon was thought of, indeed before the Greek nation came into being, there were architects

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at Knossos and in other parts of Crete building huge monuments and palaces showing consummate skill in construction and adaptation for the use of man in an advanced state of culture. In fact, Crete has been found actually to have played the part in ancient civilisation which tradition had claimed for it. With Dr. Evans among us to-night it is not for me to tell you of Crete. I will only ask him now to accept the medal as a tribute of our high esteem.

Dr. Evans said he could not adequately acknowledge the very great honour conferred upon him that evening. He knew that in some respects Crete and the Palace of Minos was very far from the workaday world in which they lived, but on the other hand he felt that anything he had done towards lifting the veil which concealed early civilisation could not have been achieved had it not been for the very powerful and devoted help that he had received from a band of workers, and, therefore, he felt that anything which was said in the kind reception of him that evening should be shared by those who had shared the work with him, amongst whom were Dr. Mackenzie, Mr. Christian Doll and Mr. Theodore Fyfe. He knew that from some points of view—from the point of view of grandiose architecture as they saw it in Greece—the Minoan work represented a more primitive stage, but it showed the extraordinary advance which had been achieved a thousand years before the days of Greece. He also wished to express his gratitude to the British School at Athens, and in a more particular degree to Dr. George Macmillan, the Secretary, without whose cordial collaboration they could never have achieved the results which had been gained.

Dr. Evans gave a short lecture on

The Palace of Knossos as a Sanctuary and the "Miniature Frescoes."

He drew attention to the evidence that had accumulated throughout the whole course of the excavation of the religious aspects of the great building. It was a sanctuary as much as a palace, and the Minoan kings were also priests. It was unlike other palaces either of the ancient or modern world, in which the demands of cult might be satisfied with a single shrine or chapel. In some respects it might rather be compared to the Vatican, for it swarmed with shrines and halls for ritual functions. The evidence of a whole series of finds had now shown that the chief divinity of Minoan Crete was a virgin goddess akin to Rhea and the Asiatic Artemis, and the kings of Knossos seem to have administered their realm as her high priests. Besides the pillars of her shrines the aniconic image of the goddess was the sacred double axe, and the wonderful painted sarcophagus discovered by the Italian Mission at Hagid Triada, near the southern coast of Crete, showed an actual scene of worship in which offerings were being made to a pair of these axes rising from stepped pedestals. The double axe, as was well known, recurred at a later date among the kindred Carian population as the attribute of their Zeus, called from its native name *labrys* "Labrandeus," and the view, put forth on philological grounds, that the Cretan Labyrinth derived its name from a dialectic form of the same name was fully confirmed by the archæological evidence. The Palace of Knossos was before all things "The House of the Double Axe," and was thus the true Labyrinth of tradition.

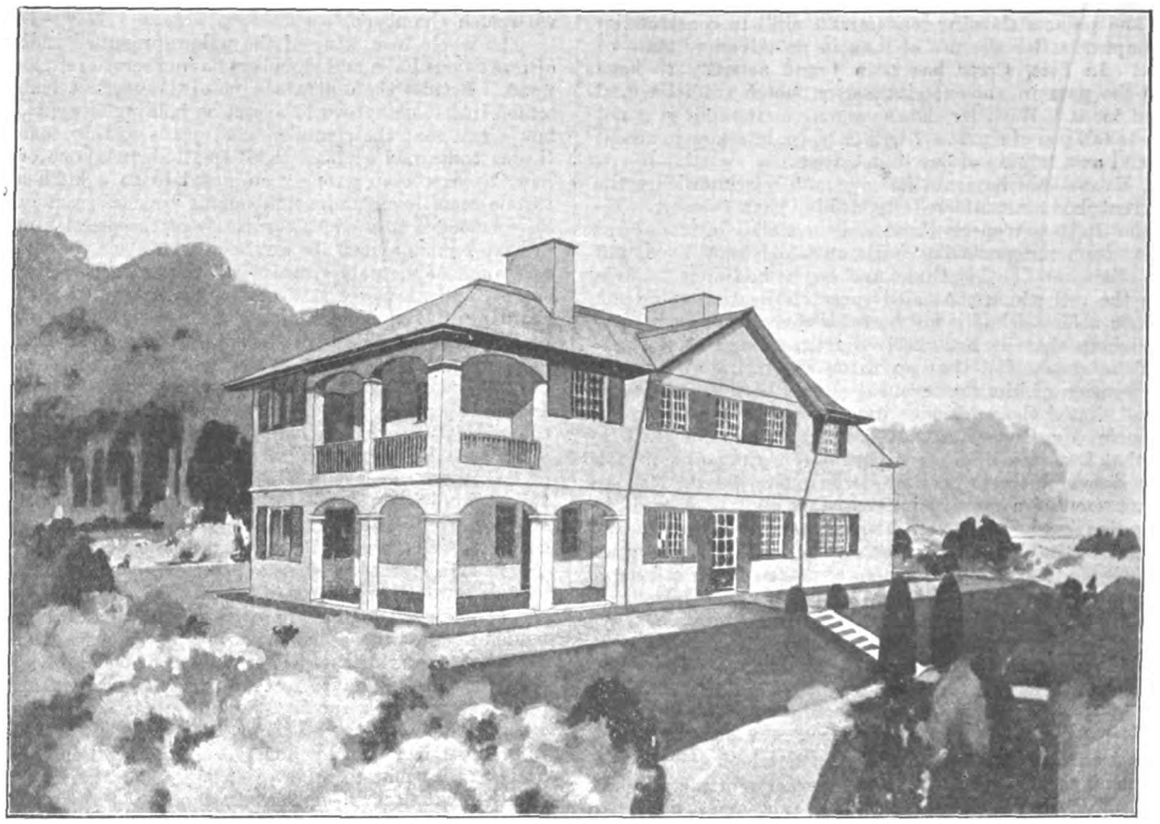
Dr. Evans said that exception had been taken to his view that the double axe, so constantly recurring on the palace blocks, was anything but a mere mason's mark, or had any religious signification. Certainly there were many masons' marks on the palace blocks besides the double axe. But in several cases it could be shown by their distribution that these had a distinct application to the character of individual parts of the building. Several of these marks, in fact, belonged to the current hieroglyphic system and possessed a recognised ideographic value. The double axe, for instance, could be shown to recur in what appeared to be official titles and coupled with the palace sign. It was far more numerously applied to the palace walls than any other sign, and marked the principal lines of wall and entrances, the grand staircase and the most important reception hall. Its repeated occurrence on the stone pillars rising in the centre of two small basement rooms might be taken to show that they possessed a special sanctity. This view had been doubted when Dr. Evans first put it forth, but the discovery of many other similar pillar rooms exhibiting evidence of religious usage has now put the matter beyond doubt. These "pillar rooms" were the "crypts" of Minoan sanctuaries. In the south-east House of Knossos the base of a sacred double axe was actually standing against such a pillar, which itself, again, was marked by the sacred symbol. Ritual vessels and bases of the same kind were found both in the palace and elsewhere, either within or in close association with such chambers.

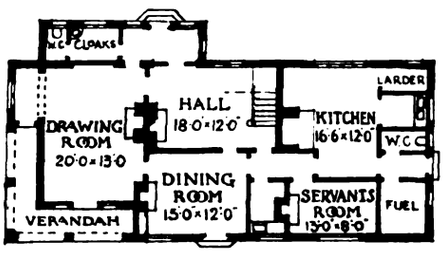
The whole west wing of the palace presented indications of its various halls and chambers having served religious purposes. Besides the central shrine of the goddess, here represented in her nether-world aspect as holding serpents, it was now clear that the chambers contiguous to the room of the throne contained at least three small shrines, one of which had at first been wrongly supposed to be a kitchen. The throne room itself and neighbouring benches seem rather to have belonged to a small consistory of the priest kings than to have been intended for any secular usage. At the north-west angle of the palace, near this, had existed another pillar shrine, and an upper hall of a ceremonial nature, the wall-paintings taken from which exhibit a columnar structure with pairs of double axes stuck into the capitals and sacral horns above the stylobate. Other fragments of fresco from the same place showed votaries bearing gold and silver vessels, and others, again, related to the sports of the bull-ring, which themselves seem to have had a religious connection. But the Miniature Frescoes, derived from some sanctuary structure on an upper floor near the northern "piazza," gave the fullest impression of the religious functions of the palace. Dr. Evans described the methods by which two complete designs, each forming a separate panel, had been reconstructed from the fragmentary remains. One of these depicted crowds of spectators of both sexes looking on at a dance of gaily-dressed females in a court below, and a discovery made by him this season had supplied a welcome illustration of the character of the performance. From a tomb just excavated near the royal tomb already explored, and of the same interesting structure, he had obtained a gold signet with a finely-engraved design, the lower part of which exhibited similar dancing female figures parallel in attitude and arrangement to those of the fresco. But in this case, together with sacred emblems, a figure of the great Minoan goddess appeared above in a reserved celestial space. The dance then was of a religious and orgiastic character, and in honour of a goddess who in a later Hellenic garb appears as Aphrodité Ariadnè. The court, with dancing votaries depicted on the fresco, which was obviously some part of the actual "palace" system, may be taken to represent the actual "Dancing-place of Ariadné," which Daedalos, according to the Homeric tradition, was said to have fashioned "in broad Knossos."

The other panel showed the same crowds of spectators thronging the courts and terraces of a building, the central feature of which is a small, brilliantly-coloured pillar shrine with a taller central compartment and two lower wings. It is probable that this may actually represent a shrine existing in the northern quarter of the palace. Some curious evidence to which attention was called seemed to indicate that in the latest period of the remodelled palace a pillar shrine of the same kind had stood in the part of the west wing facing the central court, near the place where the repositories of the earlier shrine of the snake goddess had been discovered. On the face of a low stylobate bordering the court in this quarter traces had appeared, made clearer by successive seasons' rains, of two pairs of column bases with an intervening blank space between them, where, according to the typical plan of the Minoan pillar shrines, as shown on the fresco, the central cell would have risen. It was noteworthy, moreover, that in the inner space within one of these wings had been found a series of clay seal impressions showing the great Minoan goddess on a height between two guardian lions with a small pillar shrine on one side. These sealings themselves naturally indicated the neighbourhood of a sanctuary, and what made the evidence still more suggestive was the appearance inside the central space between the pairs of column-bases of a curious recess, in the bottom of which remains of a chest containing clay documents had been found. Putting two and two together, Dr. Evans had arrived at the conclusion that they had here the more or less complete ground-plan of a small Minoan pillar shrine, the plan and elevation of which were now shown.

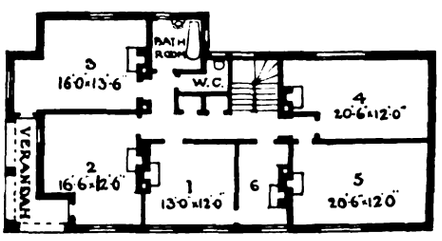
Dr. G. A. Macmillan proposed votes of thanks to the President for his address and to Dr. Evans. He said he was extremely glad to see reference made to the proposed architectural school at Rome. When allusion was made to the project last year there was a flutter because some thought the British School was already in existence there. The members of the British School of Archæology in Rome had, however, put themselves into communication with the Council of the Institute and had met with such cordial treatment that he had every reason to believe that the admirable scheme proposed would be carried through. Mr. John Simpson would represent the Institute on the committee, and the speaker

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·GROUND·FLOOR·PLAN·



·BEDROOM·PLAN·

HOUSE·ON·THE·BRANKSOME·CHINE·ESTATE·DORSET

said he felt sure that when the movement took shape and form it would satisfy every one interested.

Mr. GEORGE HUBBARD seconded the motion, which was carried unanimously.

It was announced that at the next meeting on November 15, Mr. H. Inigo Triggs would read a paper on "The Planning and Laying-out of Public Places."

HOUSE ON THE BRANKSOME CHINE ESTATE, DORSET.

THE house in the Branksome Chine is built of rough local brick, rough casted, and roofed with Delabole grey slates. A north Italian-Swiss effect was aimed at, and the colouring assists the idea. The woodwork is pale green and the external walls are distempered light pink. Messrs. CUBITT & GOTTS were the contractors, of Ipswich, and Mr. R. HEYWOOD HASLAM, of London, is the architect.

New Oak Choir Stalls were dedicated on Friday last by the Bishop of Exeter at the church of St. Thomas, Exeter, as a memorial to the late Thomas Maitland Snow. Improvements have also been carried out in the sanctuary, including new carved oak altar rails. The work has been executed by Messrs. Dart & Francis, of Crediton, from the designs of Mr. Harbottle Reed, F.R.I.B.A., of Exeter.

ILLUSTRATIONS.

SELBY ABBEY.—NEW ROOD SCREEN, DIAGONAL VIEW—THE REREDOS—NORTH SIDE OF NAVE, LOOKING N.-W.—THE CHANCEL.

LAST week views were given of the exterior of Selby Abbey, together with a leading article on the building. The present photographs show the interior restoration as carried out by Mr. J. OLDRID SCOTT, F.S.A.

OXFORD COLLEGE SERIES, BRASENOSE.—BACK QUAD—HALL.

A DESCRIPTIVE account of Brasenose College, Oxford, appeared on October 1. Our previous illustrations show the College from the High Street, the Chapel Quad, the Library, and the Quad, showing Radcliffe Camera and St. Mary's Spire.

LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.—DETAIL FROM TRINITY COLLEGE, CAMBRIDGE.

IN our issue of October 22 we gave an illustrated article on the work carried out by the Liverpool University School of Architecture. This detail from Trinity College, Cambridge, is a further example of vacation work.

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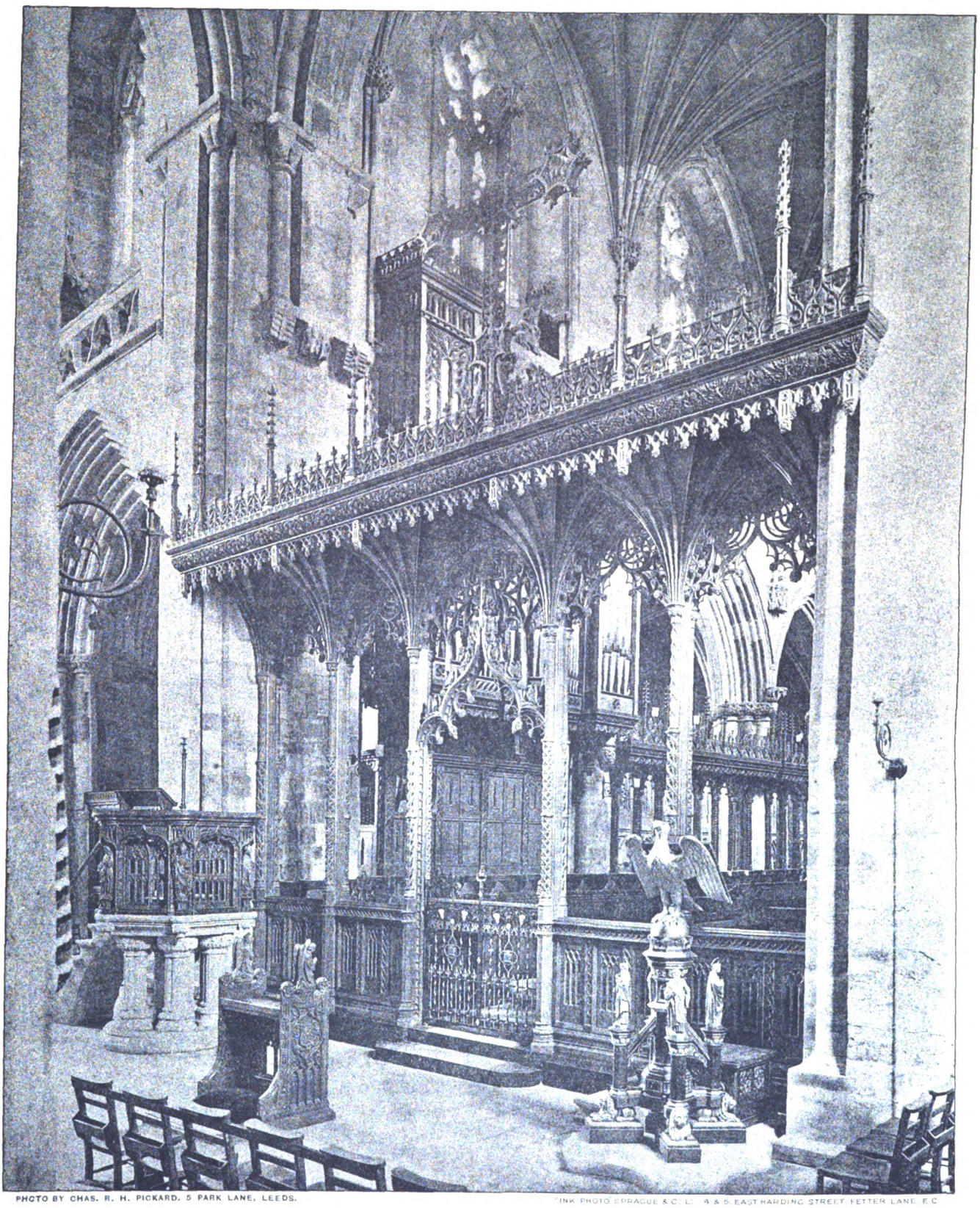


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SELBY ABBEY: NEW ROOD SCREEN. DIAGONAL VIEW.

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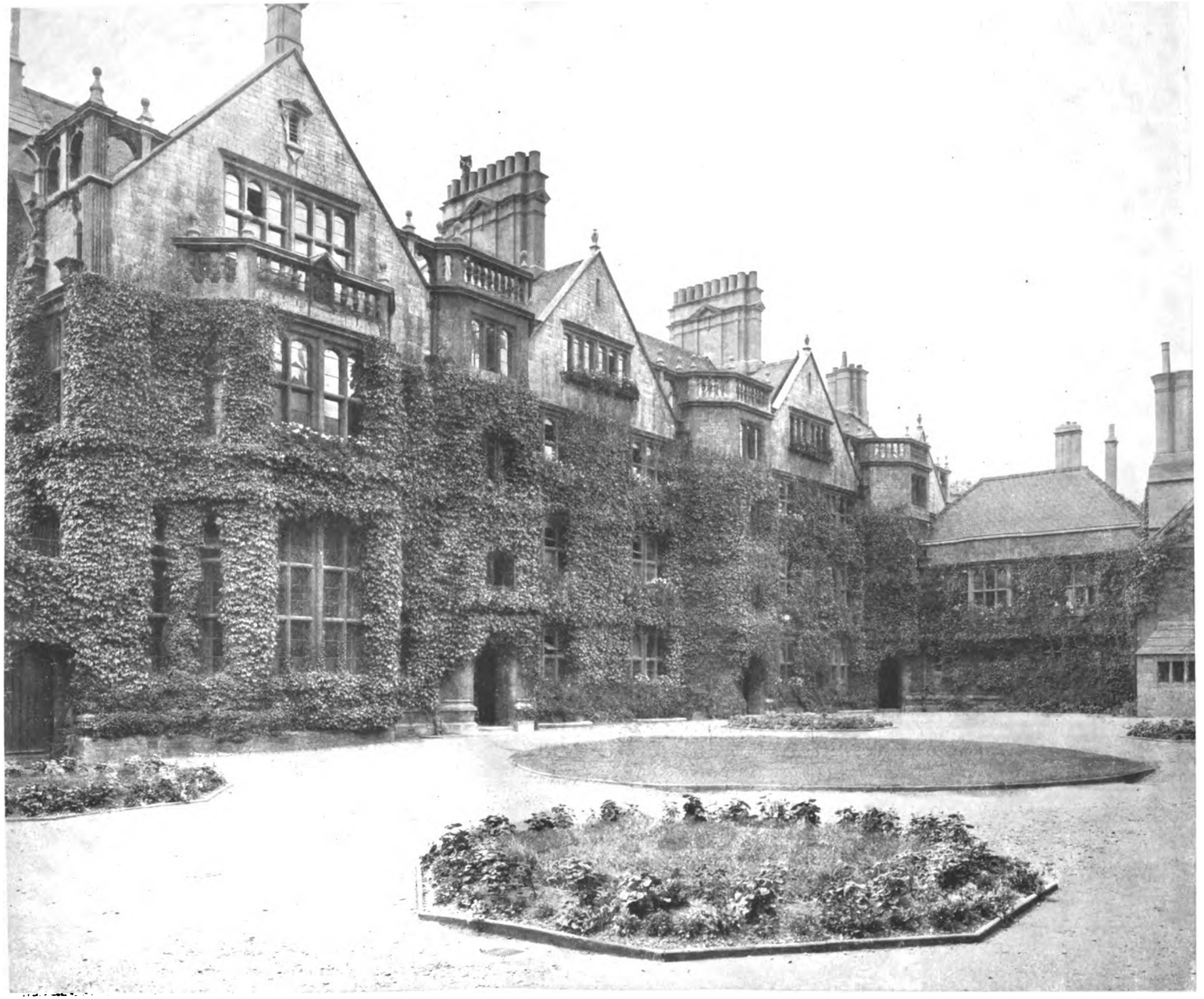


Photo by A. E. WALSHAM 60 Doughty Street, W C.

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OXFORD COLLEGE SERIES. No. 59.—BRASENOSE: BACK QUAD.

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BACK QUAD.

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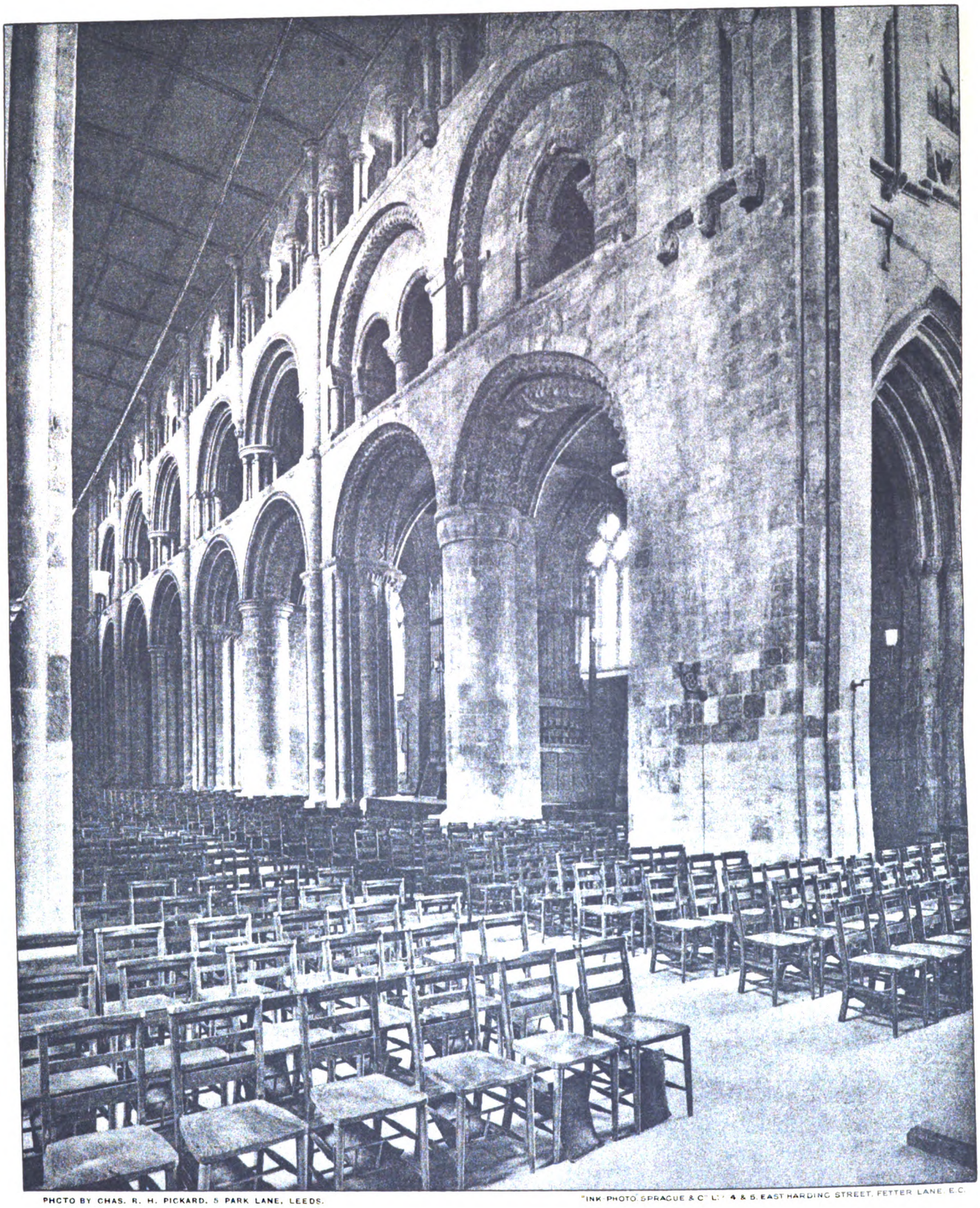


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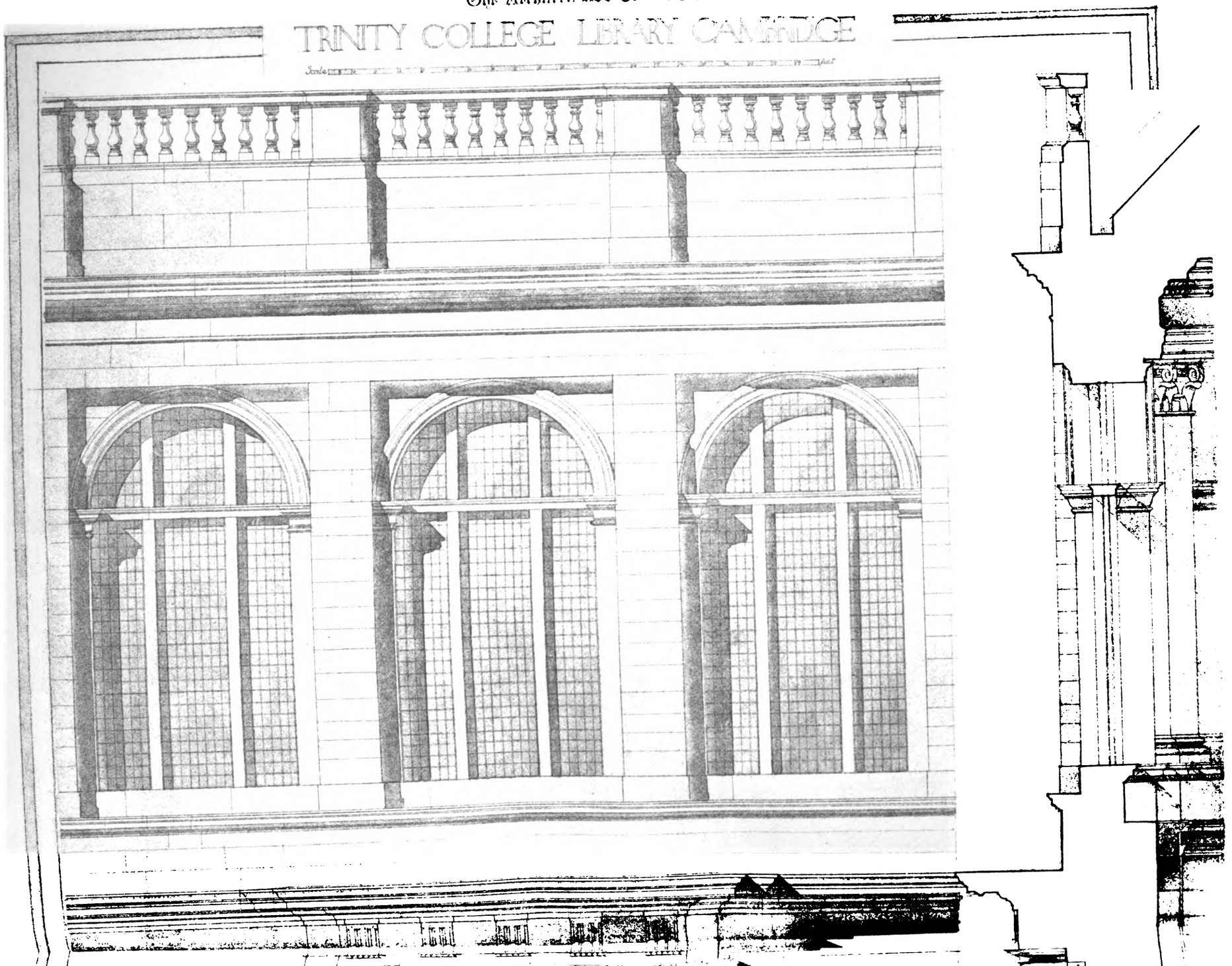
SELBY ABBEY: NORTH SIDE OF NAVE, LOOKING N.W.

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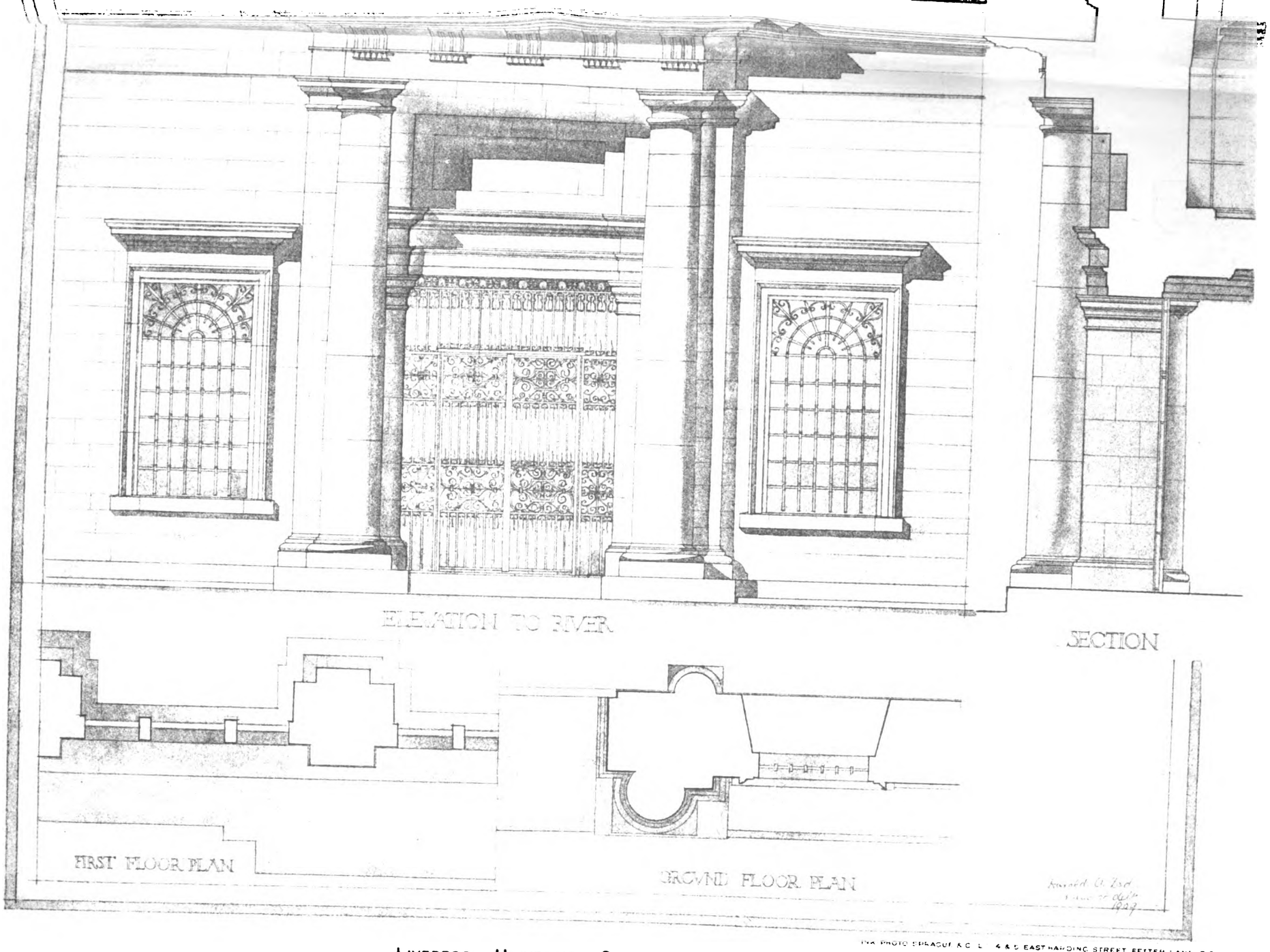
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TRINITY COLLEGE LIBRARY CAMBRIDGE

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LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.

DETAIL FROM TRINITY COLLEGE, CAMBRIDGE. Measured and Drawn by H. A. DOD.

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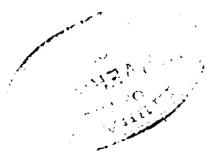


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SELBY ABBEY: THE CHANCEL.

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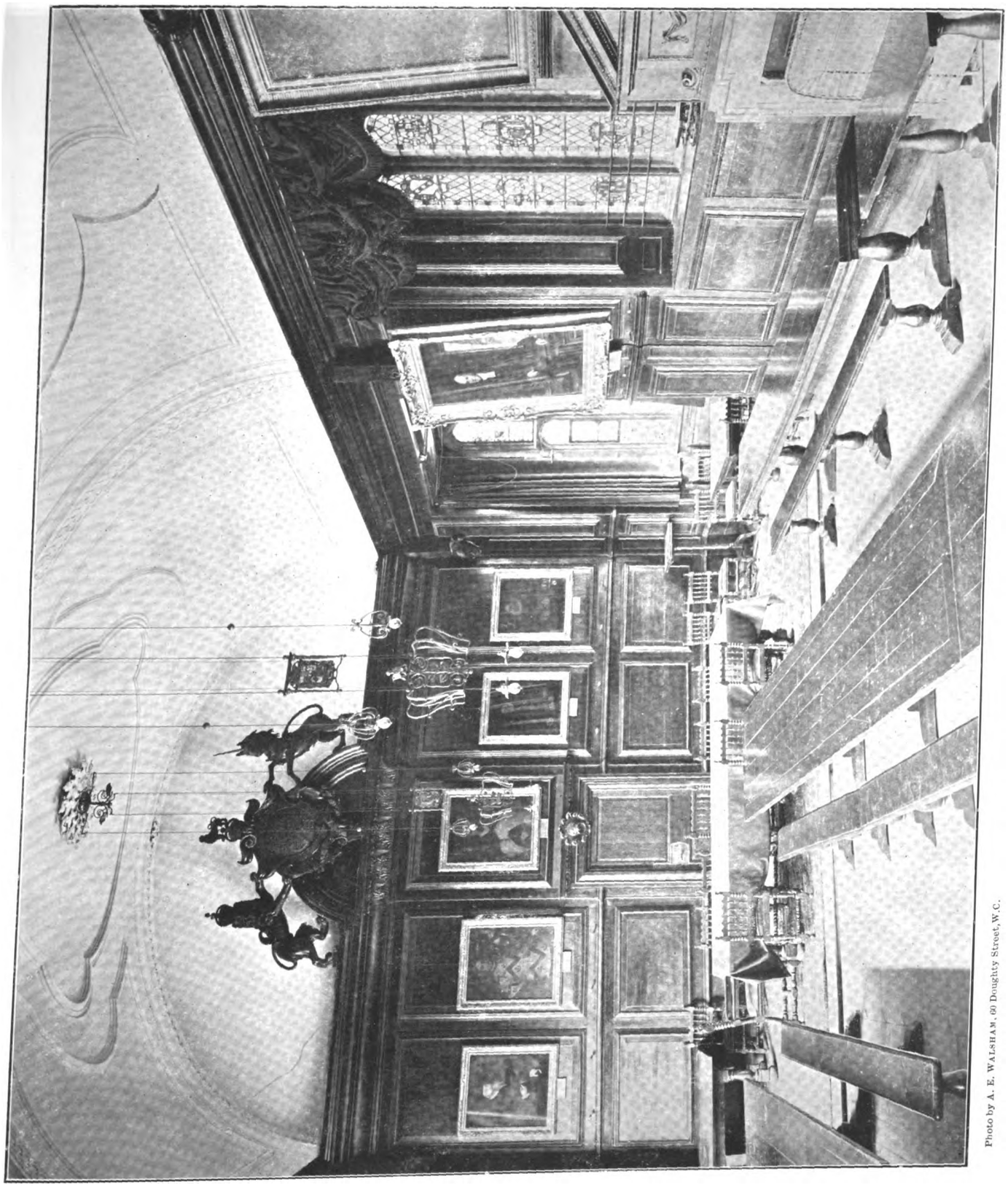


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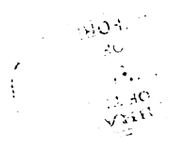


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SELBY ABBEY: THE REREDOS.

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CHELTENHAM AND DISTRICT.*

(Concluded from last week.)

SOME nine miles on the road between Chipping Norton and Moreton-in-the-Marsh is Chasleton House, perhaps the most interesting building in this district, for as it now appears it seems to belong to the seventeenth century, and everything about it suggests the Stuart period. As it was planned and designed in the reign of Charles I. so it has remained. You feel when you enter that you are in a house with a history; fortunately that history has been preserved. It was built in 1603 by Walter Jones, a wealthy wool merchant of Witney. The property and original house belonged to the Catesby family, and it was the celebrated Robert Catesby, one of the Gunpowder Plot conspirators, who sold the property to Walter Jones, in all probability to raise money to carry out the plot. One of the most exciting episodes connected with this house occurred in 1651, when Arthur Jones, a grandson of Walter, and a supporter of the Royalist cause, arrived home in the middle of the night after the battle of Worcester; he was dead-beat when his wife let him into the house, and it was not long before the Parliamentary forces were after him. He was hidden in haste by his wife in the secret chamber which led off their own bedroom, the opening to which was covered by tapestry and fortunately not discovered by the soldiers. They insisted, however, after searching everywhere, on being fed and spending the night in that particular room. Mrs. Jones drugged their wine, and when they were all fast asleep she let her husband out, and he escaped on one of his pursuers' horses.

The house is a fine specimen of Jacobean work, being built on more formal and symmetrical lines than the other houses in the district. It is square on plan, with a small central courtyard. The entrance front is on the south, with two projecting square bays with no side lights on either side. The one on the left forms a porch, and the other is a bay to the dais of the hall. The staircases are placed in two central towers on the east and west fronts, and on the north side is a small square projecting bay in the centre of the elevation, the whole forming a very symmetrical plan. Externally the house is very imposing, being higher than usual, and the two staircase towers accentuate this. The rooms are full of interesting furniture and good tapestry, and the screen in the hall is a very fine example of Jacobean work. The great parlour at the north-east corner of the building is panelled, and has a fine chimneypiece; there are also several good chimneypieces in some of the other rooms. The house contains some good plaster ceilings, that of the long gallery, which has lately been restored, being particularly fine. This gallery, which runs the whole length of the northern front, is 70 feet long and 18 feet 6 inches wide. About fifty years ago the house was re-roofed with Westmorland slates. From the top of the east staircase tower a very fine view can be obtained of the beautiful formal gardens below. There are several interesting relics preserved in the house, the most important being the Bible used by Charles I. on the scaffold, which he presented to Bishop Juxon, who attended him to the last, and who retired to Little Compton after the King's death. Another interesting document is the original deed for the sale of the property by Catesby to Walter Jones. It is curious to note one peculiar feature of this house which is also common to many others, and that is the use of other people's coats-of-arms in the overmantels of the chimneypieces. In most cases they are the arms of neighbouring families, and it has been suggested that it was a custom for the owner's friends to give him a carved chimneypiece containing their own coat-of-arms for a present. On the south-east side of the house is the church dedicated to St. Mary. Part of it dates from the beginning of the twelfth century, Bardolph de Cestron building a church there on the site of an old British burying-place. It is a picturesque building, with a southern tower, the whole forming, with the house, a very pretty group. The church was restored in 1878, when the west-end gallery and high pews were removed, and the old three-decked pulpit, which bears the date 1629, was cut down and reduced in height. The oldest part of the church is the north door; the original tower of the church was destroyed by lightning, and the present one dates from the end of the seventeenth century. To the north-west of Chasleton is Moreton-in-the-Marsh, a very interesting town which time did not permit us to visit, but some ten miles further off in the same direction is Broadway, which probably has the reputation of being one of the most picturesque villages in this part of the country.

The old church is dedicated to St. Eadburga, the granddaughter of King Alfred the Great, and dates from the middle of the twelfth century. It is cruciform in plan, with a plain central tower, the chancel and transepts being of a later date.

The nave and aisles were originally covered with lead, but this being stolen the remainder was taken off and sold about fifty years ago, and the present slate roof substituted.

The font is peculiar, being very deep and circular, and entirely without ornament, and probably dates from the twelfth century.

In the north transept are stored the remains of a good Jacobean pulpit and sounding-board. There is also some good glass of the fifteenth century in the windows of the chancel and west end.

The church is some distance from the village, and consequently is very little used, as a modern church has been built which is more accessible. Adjoining the churchyard is Broadway Court, which has been recently added on to by Mr. Guy Dawber. The old house was formerly the residence of the Sheldon family, but the only part of it that is left is the old gateway, which has been utilised as a front entrance to the new house.

One of the most interesting houses in Broadway is Abbots Grange, which formerly belonged to Pershore Abbey, and was built in the fourteenth century. This house has been so often sketched and measured that probably everyone is familiar with it. Considering that it has in turn been used as a village lock-up, a workhouse, and subdivided into cottages, it has really suffered very little, and its present owner has very carefully preserved the old features of the house, and even the new studio which Mr. A. N. Prentice has lately added is built on the foundations of the old kitchens. Some of the windows show traces of the floors which had been inserted, as they are filled in above the transoms. The hall, which has a good open timber roof, runs north and south, with the dais at the south end and the kitchens on the north. There is no trace of any fireplace, and if there was one in the centre of the room there is no sign of any exit for the smoke.

A curiously contrived staircase leads to the Abbot's solar, which has a squint which commands the kitchen door; this room also contains the remains of a fireplace, and has a good two-light window with reticulated tracery.

The Lygon Arms is another interesting house. This inn dates from the middle of the sixteenth century, and the entrance door bears the date 1620 and the names John and Ursula Trevis. For over 300 years the inn was known as the old White Hart, the name being changed when it came into the Lygon family at the beginning of the nineteenth century. Charles I. is supposed to have stayed there, and met Sheldon, one of his supporters, in the oak-panelled room; and Cromwell slept here before the battle of Worcester, probably occupying the room which now bears his name. This room has a fine enriched plaster ceiling and frieze.

Passing through the villages of Willersley and Ashton-sub-Edge, both of them containing some very nice domestic work, you come to Chipping Camden, which is supposed to have derived its name from its being the meeting-place of the Saxon kings, who, at the end of the seventh century, held a conference here about the war with the Britons.

It was the centre of the wool trade in the fourteenth century, and carried on a considerable trade with Flanders. The town remained prosperous throughout the fifteenth century, and it was not until the Flemish settled in the West of England and started manufacturing cloth at the place of production that the town gradually declined. In the eighteenth century it again enjoyed a period of prosperity, as it was the centre of the silk trade.

The church dedicated to St. James was built at the end of the fourteenth century, chiefly at the cost of William Grevel, a wool stapler. It is in the Decorated style, with a fine embattled tower at the west end 120 feet high, with massive buttresses and surmounted by twelve pinnacles. It has two side chapels, the one on the south side containing a fine monument to Sir Baptist Hicks, first Viscount Camden, who died in 1629. There are also monuments to the Noel family and some brasses, the earliest of which is to the memory of William Grevel, the supposed founder of the church, and his wife; he is described thereon as the "Flower of the Wool Merchants of England."

The nave consists of five bays, and has an east window above the chancel arch. There is a tradition that the tower was built by the same builder as that of Gloucester Cathedral, for there is an old rhyme in existence which runs:—

"A man by the name of Bower built Gloucester
Cathedral and Camden Tower."

* A paper read before the Architectural Association on October 22 by Mr. F. Dare Clapham, F.R.I B.A.

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There is in the church a magnificent crimson cope, very richly embroidered, and dating from pre-Reformation times.

Near the church a fine mansion was erected by Sir Baptist Hicks at the end of the sixteenth century. It was destroyed by the general in command of the Royalist forces in the civil wars to prevent it from falling into the hands of Cromwell. Very little of the old manor house remains; it was built in the Italian style, and it was probably one of the most magnificent houses of the day, as it is stated that 30,000*l.* was spent on it.

Sir Baptist Hicks also built the row of picturesque almshouses near the church, and in 1627 the old market hall, which has a stone arcade and fine open timber roof, and forms the most noteworthy feature in the main street.

The old Wool Staplers' Hall is now used by Mr. C. R. Ashbee as a private residence. It has a curious oriel window which Mr. Ashbee explains was probably the result of rebuilding in the sixteenth century the original mediæval window, which had probably fallen. In the big room on the first floor there is a large open fireplace with the arms of the Calfe family in one of the spandrils. Its present owner has done much to preserve the original features of the house. Opposite this house is the one formerly occupied by William Grevel. It has two fine bay windows showing distinct traces of Flemish design.

Some few years ago the Guild of Handicraft moved from London to Chipping Camden, and the old silk mill became their principal workshop.

Some three miles west of Cheltenham, on the way to Gloucester, is Churchdown, or Chosen, with its church standing right on the summit of a hill some 600 feet to 700 feet high. In all probability this hill served as a Roman signalling station. There is a quaint inscription on the tower recording that this "Bellhows was Bvyldede in the yeere of ove Lorde God 1601." Tradition says that this church served two villages, the one on the north being called Chosen and the one on the south Hucclecote. The inhabitants of the latter village appear to have been very jealous of the former, and it is said they objected one Sunday to the text, "Make Thy Chosen people joyful," and indignantly asked, "What have the Hucclecote people done?"

About four miles further on to the south-west is *Gloucester*, a city which has often figured in history; it was an important military station under the Romans, and surrendered to the Saxons towards the end of the sixth century. Owing to its position on a navigable river, it has always been of some importance.

In the time of William the Conqueror it was a favourite resort for his court, and several of the Norman kings used to spend Christmas there. In 1087 the city was nearly destroyed during the contest between William II. and his brother Rupert. Later it was the scene of many conflicts between Henry III. and the barons, owing to his having appointed a foreigner as Constable of the Castle. It suffered from fire three times in the twelfth century, and again in the middle of the thirteenth century. Parliaments were held there by Edward I., Richard II., and Henry IV. In 1483 Richard III. came to Gloucester after his coronation, and from here gave the orders for the murder of his two nephews

The city opposed the Royalist cause in the Parliamentary wars, and for this reason at the Restoration its walls were destroyed. The siege of Gloucester lasted nearly a month in 1643, the Royalist army being under the command of the king.

The walls of the city were 5 feet to 9 feet thick, surrounded by a deep moat; there were four gates, north, south, east and west, about a quarter of a mile apart, and where the four roads met in the centre of the town there was a High Cross, which was demolished in 1750.

One of the most interesting buildings in the city is the New Inn, built at the end of the fifteenth century by John Twining, to accommodate the number of pilgrims who flocked to the tomb of Edward II. The New Inn was probably so called because it was built on the foundation of an older one; it was formerly one of the possessions of the Abbey of St. Peter, and after the dissolution of the monasteries it was granted to the Dean and Chapter, in whose possession it remained until recently, and formed part of their income. It is a picturesque, half-timber framed building, built round two courtyards, and covers a good deal of ground, being, without the stables, 170 feet long. The rooms all lead to open galleries running round the courtyards, approached by outside staircases to the different floors; the whole of the timber is chestnut, and parts of it are richly carved. There is a well-preserved angle-post at the corner of New Inn Lane, on which is some beautiful carving. There are two figures, both angels, holding scrolls bearing the words "Salve" to welcome the coming, and "Benedicti" to speed the parting guest. The canopies above the figures are particularly good.

In Westgate Street there is a house with an old front with good windows bearing traces of Flemish influence; a chimneypiece inside bears the date 1633, and is celebrated as the house which Colonel Massey made his headquarters in 1643, when the city was besieged by Charles I. Many of the houses contain good panelling and elaborately carved chimneypieces.

In the house opposite the Corn Exchange, in Southgate Street, which has a carved and ornamented front, there is a handsomely carved chimneypiece, bearing the date 1650.

The house where Robert Raikes (the founder of the Sunday Schools) used to live is an interesting half-timbered building with three gables.

There are several good examples of gate piers in the city, those standing in front of the Foresters' Hall and another house in Westgate Street being most noticeable. There are numerous churches in Gloucester, but most of them are of a late date, having been erected on the site of earlier buildings.

It is not possible to do more than give shortly a few particulars about the history of the cathedral.

At the end of the sixth century, on the site of the present cathedral, a monastery was first built which was destroyed by fire, as was also in 1058 the Benedictine one which superseded it.

The foundation stone of the present cathedral was laid in 1089, Abbot Serlo being in charge of the work. Twice at the beginning of the twelfth century the fabric suffered by fire, and it is probable that in one of these fires the original timber roof of the nave was destroyed. This flat wooden roof was some 20 feet higher than the present vaulting, which was finished about the middle of the thirteenth century. The columns of the nave show traces of fire, being much calcined. There were two more fires at the beginning of the fourteenth century, and the south aisle of the nave was then built to save the south side from falling.

The murder of Edward II. in Berkeley Castle did much to spread the fame of the abbey church, for Abbot Thoky, fearing no vengeance from the Queen, brought the body of the dead king to Gloucester. When Edward III. came to the throne this loyal Churchman had his reward, for a fine tomb was erected by the new king, and streams of pilgrims began to flock to the city, and the coffers of the abbey were consequently enriched.

It is said that the funds at the disposal of the monastery at this time were sufficient to completely rebuild the abbey.

In the early part of the fifteenth century the reigning abbot destroyed the west front with its two towers, and is supposed to have added the south porch. In about the middle of the same century the central tower was demolished as far as the Norman piers, and the present beautiful tower was added, and the lady-chapel was built towards the end of this same century. It was not, however, until the reign of Henry VIII. that the abbey was made a cathedral.

The nave piers are just over 80 feet in height, being nearly twice the height of those at Norwich; they are about 21 feet in circumference and 12 feet 6 inches apart. The present flooring of the nave is some 10 inches higher than the original pavement.

Mr. Waller, who carried out the repairs of the cathedral in 1856, says that the whole of the nave was painted. It was at one time proposed by Kent to flute the columns, but happily the architect found out that they consisted of a stone casing filled in with rubble.

We were fortunate enough to be shown over the cathedral by the superintending architect, Mr. F. W. Waller, and the careful ½-inch scale plans which he had prepared of the various stages of the tower were of great interest. The tower at the roof level is 40 feet square and 225 feet high; it is carried by four Norman piers, which are loaded to the extent of 12 to 13 tons per foot super., a load which would make a district surveyor's hair stand on end at the present day, for the total weight of the tower is about 4,700 tons. The pierced corner pinnacles, which weigh 25 tons each, are supported at the inner angles by slight squinch arches, and probably with the idea of reducing the weight of the topmost storey, the walling of the panels is only 8 inches thick.

The cloisters were built during the latter half of the fourteenth century, and are probably unsurpassed in beauty by any in this country. The monks' lavatory, which occupies four bays of the northern side of the quadrangle, is 47 feet long, and is in a fine state of preservation, even the waste water tank being discovered about twenty years ago.

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Perhaps the most interesting part of the cathedral is the choir, which at first sight appears to be entirely Perpendicular work, but in reality this is only a thin casing to the original Norman work behind; this casing was put on during the fourteenth century, and is very cleverly contrived. In order also to make room for the splendid east window, which is 72 feet high and 38 feet wide, and some 5 feet wider than the choir, the two end Norman piers of the apse were removed, as was also the eastern apsidal chapel, when the lady-chapel was built; these alterations are made perfectly clear by an examination of the crypt, where the foundations of the original Norman work remain. On the north side of the choir is the tomb of Edward II.

It would take an entire evening to describe all the beauties of this splendid cathedral, which is probably so well known to all of us, and, therefore, these brief remarks must suffice to-night to deal with what is probably one of the most interesting ecclesiastical buildings in this country.

This concludes the list of places visited on the fortieth excursion of the Architectural Association, an excursion rendered all the more enjoyable by being blessed with the only real summer weather we have had this year.

I should like to take this opportunity of expressing my gratitude to Messrs. Hennings, Searles-Wood, Gregg and Yates for the photographs with which, by their kindness, I have been enabled to illustrate this paper, also to the various members of the party who have so kindly lent the drawings and sketches which adorn our walls this evening. I think you will all agree with me that our hard-working honorary secretaries, Mr. Talbot Brown and Mr. A. W. Hennings, arranged for us a most excellent programme, not the least charming feature being the modern work which it was our good fortune and privilege to see, and which will, I am sure, be the centre of interest on future excursions in the Cotswold district.

Mr. E. Guy Dawber, in proposing a vote of thanks to Mr. Clapham, said he thought that they might make it a rule that every year one of the members who went on the annual excursion should read a paper dealing with the places visited and so furnish a delightful record, which would be appreciated by the members who were not able to go with the party. That evening's paper was exceptionally valuable because it was not a mere catalogue of interesting details and events, but they had been told about the people who lived in the houses and places, and to his mind one of the great charms of Old English architecture was the romance associated with it. Years ago on the excursions the President for the time being used to give a brief résumé of the places visited, but now the members of the party were so anxious to sketch and photograph that nothing was said by way of introduction. He suggested that the President in the second year of office should give a short résumé before the members got to work. He thought Mr. Clapham struck the key note of his subject when he said that the Cotswold work depended for its charm on simplicity and proportion, and when they had said that they had uttered everything that could be said about good architecture. The Cotswold district was cut off from the surrounding country, and he thought there was no doubt that that remoteness and the wealth of the community which had accumulated during the prosperity of the wool merchants had given them such a great number of beautiful buildings all more or less bearing a family resemblance. In other parts of England they got variety of treatment, but in the Cotswold district they saw work which showed that the tradition of building lasted for a hundred years. It was interesting to watch the way the old builders took up the Renaissance, introducing it into the accessories of the house, but when once they had mastered the Classical work, they were such an artistic people and the tradition of good work was so strongly imbued in them, that they were able to do the most charming buildings just as finely as the earlier work.

Mr. H. D. Searles-Wood seconded the vote of thanks.

Mr. John Johnson supported the motion and hoped that the result of the lecture would be to induce more members to go on the excursion.

Mr. C. E. Bateman, expressing his appreciation of the paper, said they had within the space of an hour gone over ground which had taken them a week to visit.

Mr. A. N. Prentice said the same type of building seen in the Cotswold district was curiously enough found in Northamptonshire, and he supposed that was accounted for by the seam of stone which ran through England from the Wash to the Severn, as all over that district one found the same kind of building and the same architecture.

Mr. S. Flint Clarkson also supported the vote of thanks.

The President, in some concluding remarks, said it had been agreed that the annual excursion was in future to be the subject of one lecture during the session and thus secure a record of the work done.

Mr. Clapham, in his reply, said he had only spoken about one excursion. Unless members had been on one they could not realise the fascination of such events. He compared the delights to that found in a Christmas gathering. They looked forward to it because it was the one week in the year when they could forget office worries and cares, and when principal and pupil had one thing in common—the enjoyment of the beautiful architecture of the rural districts of their own country.

MIDDLESBROUGH LIBRARY COMPETITION.

We have received the following letter from the gentlemen who have acted as ringleaders and spokesmen of the architects dissatisfied with the assessor's award:—

Houndgate Chambers, Darlington:
October 28, 1909.

Dear Sir,—We have now obtained counsels' opinion in regard to above, copy of which we enclose for publication.

We trust that this action, subscribed to by eighty-three of the competitors, will do some good in future competitions, showing as it does our legal position, and we would suggest the necessity of the assessor drawing up the conditions himself when practicable or, if he accepts them, being bound to see that they are fully carried out.

In concluding this matter we would desire, on behalf of the large body of architects whom we represent, to acknowledge your extreme courtesy and to thank you for your assistance in ventilating the matter in your Journal and the valuable support you have given us.—Yours faithfully,

Hoskins & Brown,
Kitching & Lee,
W. H. Bourne.

Opinion of Mr. C. A. Russell, K.C.

1. For the purpose of this opinion I assume (but without expressing any opinion on the point) that the designs to which the professional assessor awarded the first and second places did not comply with the "Instructions to Architects."

There is no evidence of fraud or misrepresentation on the part of the committee or of the assessor, and if the unsuccessful competitors have any right of action it must be for breach of contract.

I think the effect of the advertisement and the "Instructions to Architects" was that the Library Committee (as agents of the library authority, the Borough Council) promised each architect who should compete that they would appoint a professional assessor to adjudicate on the designs, that they would submit his design to such assessor, and that if such assessor should adjudge his design to be the best, second best, or third best, respectively, they would pay him 50*l.*, 30*l.*, or 20*l.*, respectively.

I am of opinion that there was good consideration for such promise, and that an action would lie for the breach of it (*see, e.g.*, Carlill *v.* Carbolic Smoke Ball Co., 1893, 1 Q.B. 256), but if this was the whole of the promise it is clear that there has not been any breach of it. In order to establish a cause of action, the unsuccessful competitors must show that there was an undertaking by the committee either (1) that only such designs as complied with the "Instructions" should be submitted to the assessor, or (2) that the assessor in making his award would disregard all designs which did not comply with the "Instructions," or (3) that the assessor would correctly decide the question whether a design did or did not comply with the instructions. I am of opinion that no such undertaking can be derived from the advertisement or instructions. I think it would be most mischievous to treat the committee as having reserved to themselves the right not to submit a design to the assessor on the ground that in their opinion it did not comply with the instructions, and I think the provision that the judgment of the assessor shall be final excludes any right of the committee to override or disregard the award of the assessor on any ground whatever. I am of opinion that the unsuccessful competitors have no right of action against the Council or committee.

With regard to the assessor I am of opinion that there was no contract between him and the competitors, and that they have no cause of action against him. No doubt it was part of his duty in adjudicating upon the designs to consider whether they complied with the instructions, and not to award the first, second, or third place to any design which in his opinion did not fairly comply with them. But I think this was a duty of a judicial or quasi-judicial character and not

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one for a breach of which an action would lie against the assessor.

Even if there has been a breach of contract on the part of the Council or committee, I think an unsuccessful competitor could not recover as damages any expenses or loss caused by his work in preparing a design, as such expense or loss would not be a consequence of the breach. The competitor to whom third place was awarded might perhaps recover as damages the difference between first and third premium, but in the case of the other competitors I think nominal damages only would be recoverable.

2. I have advised that no action will lie. But the competitors might be regarded as parties to a reference to the assessor, and if it could be shown that he had made his award without considering whether the successful designs complied with the instructions a Court would perhaps, upon a proper application, set the award aside. But there might be difficulty in proving that there was a submission to the assessor which would bring the case within the Arbitration Act (see Sec. 27), and if the assessor had considered and determined, however erroneously, the question whether the successful designs complied with the instructions, I think the Court would not interfere with his decision.

3. Possibly it would be some protection to competitors if in all such cases as the present it was made a definite instruction to the assessor that he was to treat as disqualified for a prize any design, however excellent in other respects, which did not fully comply with the conditions of the competition. But I think the only effectual protection of the competitors is the competence and fairness of the assessor.

(Signed) CHARLES A. RUSSELL.

Temple: October 11, 1909.

Opinion of Mr. C. E. Brackenbury.

I am of opinion that the unsuccessful competing architects in this matter have no cause of action.

The County Borough of Middlesbrough, through its Free Library Committee and by its accredited officers, made a certain offer, the conditions of which were contained in an advertisement (which I have not seen, but which was, no doubt, in usual form), and in "Instructions to Architects," and on a plan. In reply to this offer about two hundred architects submitted designs and impliedly accepted the conditions of the said offer. Among the conditions was the following:—"A professional assessor will be appointed to adjudicate on the designs . . . and the judgment of these by the assessor shall be final." Moreover certain dimensions and areas were indicated as "would most nearly meet the requirements," though it was added that "small deviations would not disqualify."

Various questions were asked upon the "Instructions" and "Replies to Queries" were sent to all the competing architects. I do not think that these "Replies to Queries" constituted any new contract or made any material alteration in the previous conditions. The contract, therefore, between the Corporation of Middlesbrough and the competing architects consisted in the said advertisement, the instructions, plan, and replies to queries. Has there been any breach by the Corporation of this contract? I think not.

It is alleged that the first premiated design did not conform to the instructions, and should therefore have been disqualified. I would point out, in the first place, that the judgment of the assessor was to be final, and I understand that in his judgment "the authors of the successful plans had complied with the spirit as well as the letter of the conditions." This view seems to be confirmed (1) by the Competitions Committee; (2) by the President; and (3) by the Council of the Royal Institute of British Architects.

Secondly, whether the "Instructions to Architects" have been complied with or not by the successful architects is wholly a question of fact. From my careful examination of the papers and small lithographic plans of the accepted designs submitted to me, I do not find any sufficient evidence to support the view that "the award was given to a design which did not comply with the conditions as laid down by the Council," or that there was any "wholesale violation" or "direct contradiction" of the conditions.

The divergence of views which exists seems to me to have arisen through a misreading or a misinterpretation by a large number of architects of the instructions given to them. Thus, one of their main contentions refers to the "Instruction" (paragraph 3, p. 4), which reads:—"The general lending and reference libraries are to be placed in the northern part of the block adjoining the dwelling-houses in Dunning Street, with main entrance from Dunning Street and secondary entrance from Grange Road East." This appears to have been construed by some as though it read "the general lending and reference libraries are to be placed in the *most* northern part of the block *and are* to adjoin the dwelling-houses in Dunning Street." Now, the northern part, naturally one would have thought, merely indicated that the libraries were to be in the longer arm of the letter L, which roughly forms the site, and the word "adjoining" grammatically applies to the word "block" and not to the word "libraries." I am of opinion, therefore, that the unsuccessful competitor properly interpreted and conformed to this instruction. The replies to queries Nos. 72, 100, and 106 do not, in my opinion, vary, and are not inconsistent with the instruction referred to.

I will now deal with other alleged "violated conditions." The common counter for the boys' and girls' rooms hardly seems a vital matter, and the first premiated design appears generally to comply with the instructions.

The sizes suggested for the various rooms were approximate indications, not strictly binding, as appears from the phraseology used and also from reply to query No. 28.

As to the secondary entrance from Grange Road East, it is true that reply to query No. 84 answers in the affirmative, but with a qualification, the question "Should there be two entrances from Grange Road?" But the reply to query No. 86 does not say that such secondary entrance is absolutely necessary, and there was no reason for so regarding it.

Lastly, in reference to the communication shown in the first premiated design between the news room and entrance hall, in addition to that *via* the janitor's room, such communication, though existing, need not necessarily be for the public use, and therefore the doors indicated are not to be regarded as a violation of anything in replies to queries Nos. 80 and 81.

Comment might also be made on such alleged violations in the accepted design as the juvenile book-store not having steel galleries, although the instructions said it *must be* so fitted; as the furnace being in a basement, though no basement was anticipated; as the reference library not being "entirely lighted from the roof direct"; as want of extension room; and as the catalogue room being on the first instead of the ground floor; but it must be taken that none of these points is of great importance, or is stated to be obligatory, or goes to the root of the matter.

It is, of course, unfortunate that any question of verbal construction or legal interpretation of instructions should have arisen, but it was perhaps unavoidable among such a large body of keenly competing architects, and when undoubtedly the degree of elasticity allowable was not strictly definable. If competing architects agree to accept the judgment of an assessor as final, they must, generally speaking, be bound thereby. Their duty is to read carefully the instructions, but not to read *into* them anything that is not there, and unless there are distinctly obligatory provisions, non-compliance with which is stated will be held to be a disqualification, it will be well to allow themselves a reasonably large latitude in the production of the best design.

On the other hand, the authors of any instructions or conditions of competitions should state clearly, fully, and definitely their requirements, and set out distinctly what is and what is not compulsory on all competitors, and what is left within the discretion of the individual. My own view is that any instructions should be so well and carefully compiled that no subsequent queries or replies thereto would be necessary, and that no supplementary information should be given.

(Signed) C. E. BRACKENBURY.

16 Piccadilly, Bradford: October 12, 1909.

TESTS OF CAST IRON.*

Transverse Bending Tests.

(Continued from last week.)

TABLE III. gives the transverse tests, and in this case also it will be noticed that whilst the breaking weight of the transverse test-bars shows a slight variation, when the latter are worked out on the exact section of the bar to the moment of resistance, there is very little variation in the tests obtained from those bars with increased percentages of silicon, whilst the second part of the table shows that increasing amounts of silicon have decreased the strength, which confirms the tensile tests in this respect. In this case, also, whilst the percentages of combined carbon are not very materially altered, the fractures in the 2 inch by 1 inch test-bars show increasing openness as the silicon increases from 1.30 to 2.00, the bars with the higher percentage showing the most open fracture.

* A paper by Mr. E. Adamson (Sheffield) read at the meeting of the Iron and Steel Institute.

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TABLE III.—*Transverse Tests with increasing Silicons.*

Mark.	Analysis.							Actual Percentage of Silicon added.	Size of Test-bar at Fracture.		Transverse, 3 Ft. 0 In. Centres.		Deflection.		Moment of Resistance.	
	T. C.	G. C.	C. C.	Si.	S.	P.	Mn.				Cwts.	Mean Cwts.	Inches.	Mean Inches.	f=	Mean.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.		Inches.							
H	3·56	2·98	0·58	1·53	0·110	1·19	0·90	None	2·05 × 1·050	As cast	34	...	0·344	...	20·804	...
H	,,	,,	,,	,,	,,	,,	,,	,,	2·09 × 1·040	,,	35	...	0·344	...	20·802	...
F	,,	,,	,,	,,	,,	,,	,,	,,	2·075 × 1·100	,,	35	...	0·344	...	19·953	...
F	,,	,,	,,	,,	,,	,,	,,	,,	2·095 × 1·100	,,	35	34·75	0·312	0·336	19·573	20·283
A	3·56	3·03	0·53	1·65	0·098	1·19	0·85	0·12	2·15 × 1·115	,,	39	...	0·487	...	20·430	...
A	,,	,,	,,	,,	,,	,,	,,	,,	2·11 × 1·138	,,	38	38·5	0·375	0·386	20·430	20·430
B	3·57	3·04	0·53	1·67	0·106	1·20	0·85	0·14	2·08 × 1·098	,,	37	...	0·344	...	20·833	...
B	,,	,,	,,	,,	,,	,,	,,	,,	2·14 × 1·140	,,	36	36·5	0·314	0·329	18·618	19·725
C	3·56	3·00	0·56	1·65	0·075	1·20	0·87	0·12	2·11 × 1·082	,,	34	...	0·314	...	19·056	...
C	,,	,,	,,	,,	,,	,,	,,	,,	2·092 × 1·112	,,	36	35·0	0·344	0·329	19·990	19·523
D	3·58	2·99	0·59	1·88	0·10	1·17	0·80	0·33	2·095 × 1·072	,,	35	...	0·329	...	20·084	...
D	,,	,,	,,	,,	,,	,,	,,	,,	2·092 × 1·090	,,	38	36·5	0·390	0·359	21·509	20·796
E	3·57	2·98	0·57	2·00	0·09	1·17	0·81	0·47	2·086 × 1·050	,,	30	30·0	0·314	0·314	...	17·078
M	3·56	2·98	0·58	1·30	0·077	0·59	0·68	None	2·0727 × 1·048	,,	32	...	0·329	...	19·188	...
O	,,	,,	,,	,,	,,	,,	,,	,,	2·043 × 1·052	,,	31	31·5	0·329	0·329	19·062	19·125
I	3·59	3·05	0·54	1·46	0·073	0·84	0·65	0·16	2·057 × 1·030	,,	28	...	0·281	...	17·346	...
I	,,	,,	,,	,,	,,	,,	,,	,,	2·071 × 1·026	,,	29	28·5	0·314	0·347	17·793	17·569
J	3·56	3·02	0·54	1·72	0·072	0·78	0·66	0·42	2·079 × 1·036	,,	30	...	0·344	...	18·089	...
J	,,	,,	,,	,,	,,	,,	,,	,,	2·084 × 1·028	,,	29	29·5	0·359	0·350	17·537	17·813
K	3·56	3·00	0·58	1·86	0·072	0·70	0·65	0·56	2·087 × 1·024	,,	27	...	0·314	...	16·344	...
K	,,	,,	,,	,,	,,	,,	,,	,,	2·088 × 1·030	,,	28	27·5	0·329	0·321	16·833	16·588

TABLE IV.—*Comparative Transverse Tests as Cast and as Machined.*

Distinctive Mark.		Analysis.							Size of Bar at Fracture.	Tested.	Transverse.		Deflection.		Moment of Resistance per Square Inch.	
As cast.	Machined.	T. C.	G. C.	C. C.	Si.	S.	P	Mn.	3 Ft. 0 In. Centres.		Cwts.	Mean Cwts.	Inches.	Mean Inches.	f Tons.	Mean Tons.
		Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.								
F		3·56	2·98	0·58	1·53	0·110	1·19	0·90	2·05 × 1·05	As cast	34	...	0·344	...	20·804	...
F		,,	,,	,,	,,	,,	,,	,,	2·09 × 1·04	,,	35	34·5	0·344	0·344	20·802	20·803
	G	,,	,,	,,	,,	,,	,,	,,	2 × 1	Machined	34	...	0·437	...	22·950	...
G		,,	,,	,,	,,	,,	,,	,,	2 × 1	,,	33	33·5	0·437	0·437	22·275	22·612
H		,,	,,	,,	,,	,,	,,	,,	2·075 × 1·10	As cast	35	...	0·344	...	19·953	...
H		,,	,,	,,	,,	,,	,,	,,	2·095 × 1·10	,,	35	35·0	0·312	0·327	19·573	19·763
M		3·54	2·98	0·56	1·30	0·077	0·59	0·68	2·0727 × 1·048	As cast	32	...	0·327	...	19·188	...
O		,,	,,	,,	,,	,,	,,	,,	1·052 × 2·043	,,	31	31·5	0·327	0·327	19·062	19·125
	L	,,	,,	,,	,,	,,	,,	,,	1·868 × 0·873	Machined	24	...	0·375	...	21·273	...
	N	,,	,,	,,	,,	,,	,,	,,	1·8685 × 0·880	,,	26	25·0	0·468	0·421	22·862	22·067
G		3·71	3·05	0·64	1·34	0·09	1·12	0·60	2·043 × 1·082	As cast	35	...	0·352	...	20·09	...
G		,,	,,	,,	,,	,,	,,	,,	2·081 × 1·072	,,	34	...	0·305	...	19·8	...
G		,,	,,	,,	,,	,,	,,	,,	2·078 × 1·080	,,	33	34·0	0·328	0·328	19·1	19·9
	G	,,	,,	,,	,,	,,	,,	,,	2 × 1	Machined	...	34·0	...	0·461	...	22·9

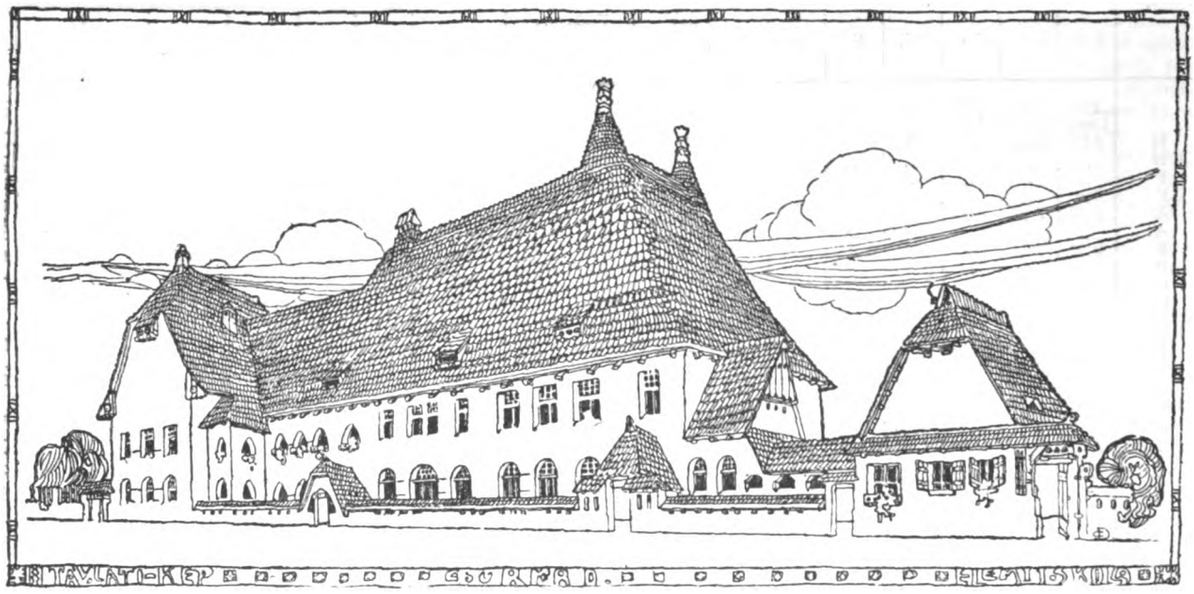
TABLE V.—*Transverse Tests from same Ladle under Different Conditions of Casting.*

	Metal from One Ladle.							Transverse 2′ × 1′ × 3′ 0″ Centres.		Deflection.		Moment of Resistance.	
	T. C.	G. C.	C. C.	Si.	S.	P.	Mn.	Cwts.	Mean Cwts.	Inches.	Mean Inches.	Tons.	Mean Tons.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.						
F *a*	3·71	3·05	0·56	1·34	0·09	1·12	0·60	35	...	0·344	...	21·1	... *
b	...	...	...	...	...	...	...	28	...	0·258	...	17·0	... *
c	...	...	...	...	...	...	...	28	30·33	0·266	0·289	18·5	18·9 *
d	...	...	...	...	...	...	...	...		...	...	...	... †
G *a*	...	...	0·64	...	...	...	...	35	...	0·352	...	20·9	... ‡
b	...	...	...	...	...	...	...	34	...	0·302	...	19·8	... ‡
c	...	...	...	...	...	...	...	33	34·00	0·328	0·327	19·1	19·9 ‡
d	...	...	...	...	...	...	...	...	34·0	...	0·461	...	22·9 §
H *a*	...	...	...	...	...	...	...	34	...	0·312	...	19·9	... ‖
b	...	...	...	...	...	...	...	31	...	0·336	...	19·5	... ‖
c	...	...	...	...	...	...	...	30	31·66	0·297	0·315	19·2	19·5 ‖
d	...	...	...	...	...	...	...	...	...	...	...	...	...

* Tested as cast. Cast flat, with no inclination.
‡ Tested as cast. Cast on edge, with no inclination.
‖ Tested as cast. Cast on edge, with an inclination of 3 inches in 3 feet 0 inch.
† Machined bar, unsound. Cast flat, with no inclination.
§ Machined bar. Cast on edge, with no inclination.

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HUNGARY.



DESIGN FOR A PUBLIC SCHOOL.—Désiré Csorna, Architect. [From *A Hás.*

Table IV. shows the difference in tests obtained from the transverse test-bars as cast and as machined, indicating a great improvement in the strength of the machined bar. It has generally been assumed that the skin of the test-bar increases the strength, but this investigation has proved quite the contrary, and results in actual practice since these tests were made have confirmed the results.

Whilst making these tests, also, it was thought desirable to see what position of the transverse test-bar gave the best results. The bars in each moulding box were cast in a different position, namely, (F) cast flat with no inclination, (G) cast on edge with no inclination, and (H) cast on edge with an inclination of 3 inches in 3 feet. The results are given in Table V., and do not show that there is any material difference in the bars cast on edge. It was shown by the author in May 1906, in his paper read before the Institute, that the transverse test-bar tested with the "fin" up—that is, the "fin" in compression and the lower part or sounder part in extension—invariably gave the best results.

THE SAN FRANCISCO FIRE.*

MR. PRESIDENT AND GENTLEMEN,—As you will perhaps recollect, the fire at San Francisco was consequent upon the earthquake. On April 14, 1906, at 5.15 A.M., the main shock occurred, followed by subsequent minor shocks. Buildings with walls of masonry and brick sustained considerable damage; chimneys, parapets, gable walls and cornices were overthrown. This being a region subject to earthquakes, a large number of the buildings, especially the residential portion, were of the wood-frame type. There were, however, a number of buildings of ordinary construction, and others again of steel-frame construction, which were intended to be fire-resisting, and it is to this latter class to which I wish more particularly to draw your attention this evening, as showing the effect of the fire on the various materials used, but at the same time it will be interesting to note the effects of the earthquake. Soon after the main earthquake shock numerous fires occurred in the city. These were occasioned in most cases by the collapse of the buildings, and were most of them in the business section.

The fire department, although efficient, and which to some extent had anticipated such a calamity, had the misfortune to lose its chief, who was injured in the earthquake by the collapse of the station in which he was sleeping, and who subsequently died; but the most serious factor in fighting the fire was the want of water caused by the breaking of the water mains by the earthquake shock, and it soon became apparent that a conflagration of great magnitude had started.

For three days and two nights the fire raged with incredible fury, destroying practically the entire business and financial section of the city, where the largest, costliest and most substantial buildings were located.

The area devastated by the fire was about 2,831 acres or 4.11 square miles. I want you to mark these figures, as we are considering the effects of the largest fire in modern times, if indeed of any time, and one which throws that of London, Chicago, Baltimore and Boston altogether in the shade; and I think it has for us some useful lessons. When I say lessons, I mean lessons from a constructional point of view, as I do not presume to come here to-night to enlighten you upon details of insurance business, of which I know nothing and of which you are all past masters.

The time has gone by, I venture to think, when it was said we do not care what the construction of a building is; we take the risk as we find it; and to-day a growing interest is taken in the construction of buildings and their surroundings and their liability to combustion both from internal and external causes, and far more attention is being paid to preventive measures by insurance experts than formerly, and this must be my excuse for appearing before you to-night, and I trust what I have to show may be of some service.

Of the general run of the buildings at San Francisco little is to be learned; they burned, collapsed, and there was an end of them; and so complete was their destruction that every scrap of combustible material was entirely consumed and blown away as ash, leaving scarcely a trace behind. But there were in certain parts of the city buildings having more or less pretensions to be fire-resisting, and these may be divided into three types:—

1. Buildings with brick or stone walls carrying floors of fire-resisting construction.

2. Steel-frame buildings with hollow tile floors and partitions.

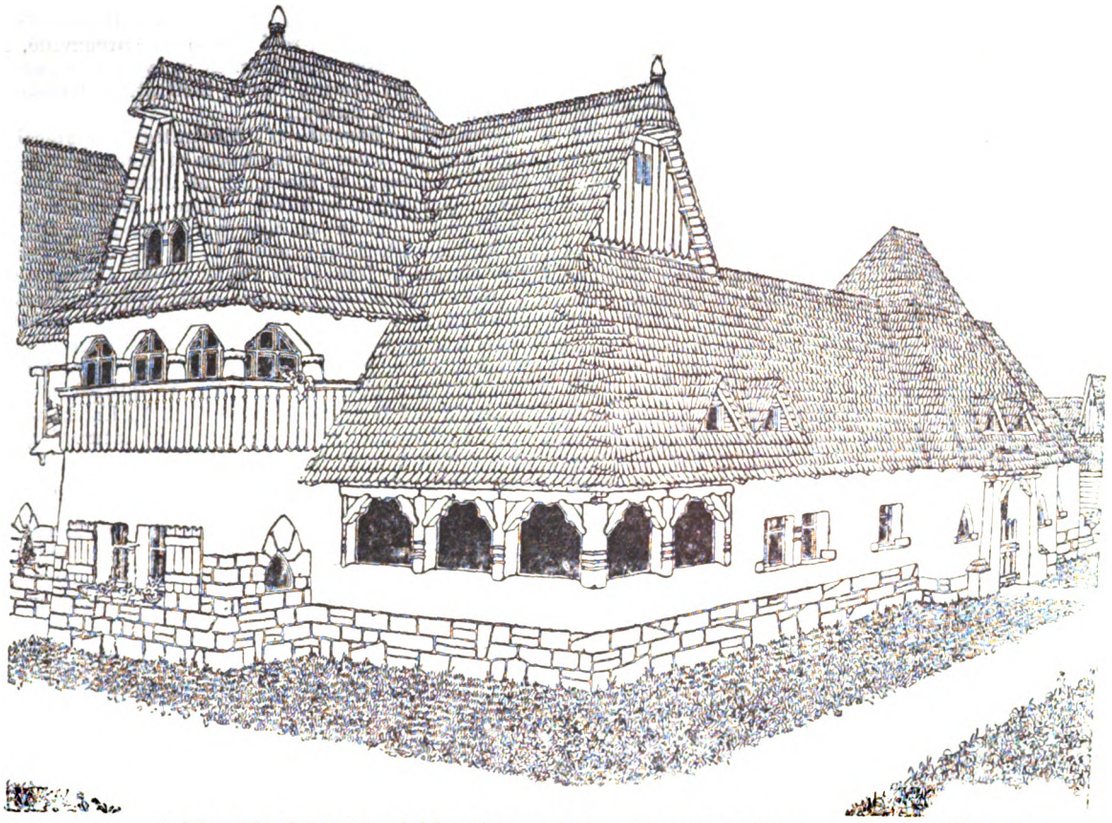
3. Steel-frame buildings with reinforced concrete floors and fire-resisting partitions.

It is my intention to show you specimens of each of these three types of construction, but it will perhaps be interesting first to note the results of the earthquake which preceded the fire, and also the effects of the fire upon a few of the ordinary types of building, viz. those having brick walls, cast or wrought-iron columns, steel or iron beams supporting

* A paper read by Mr. Ellis Marsland before the Cardiff Insurance Institute, and on delivery accompanied by lantern slides.

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A MIDDLE-CLASS COUNTRY HOUSE.—Joseph Babolnai, Architect. [From *A Ház.*

deal joists and wood floors—a type of building described in the by-laws as Class B.

I shall then come to the three types of fire-resisting buildings to which I wish more particularly to draw your attention, as they are practically the only buildings that remained after being attacked by the fire.

It will be observed in the examples which we have seen that there have been certain good points and certain bad ones or omissions, which, if they had been anticipated, would have in some cases enabled the buildings in question, if not to have come out unscathed, at least to have withstood the ordeal without material damage.

It is by adopting the good, discarding the bad, and supplying the omissions that it should be possible in the future to plan and erect a building which should be actually fire-resisting not only in the mere shell, as we have seen, but with all its internal fixtures and fittings preserved, as it is not much satisfaction to the individual tenant to be told the building remains when perhaps his little all is entirely consumed.

I think we may come to the conclusion that the steel-frame building has justified its existence and shown to the world that it is one of the most stable of all forms of construction. We in England have hitherto eyed it with suspicion and adopted it only in a half-hearted fashion, but I venture to think that it is a type of building we may well introduce, and provide in our Building Acts such rules and regulations as are applicable to this new form of construction.

The glaring omission to protect the exterior openings was the direct and sole cause of the damage and destruction of the interiors in most cases. This is further emphasised by the fact that other buildings of much less pretensions to be fire-resisting have remained undamaged by reason of their window openings having some such protection as wired glass, steel shutters, or other form of fire-resistant properly applied. I would therefore sum up my observations by inculcating the following lessons:—

1. *Protect the openings against fire from the outside.*—This, to my mind, is the most important lesson, and is the key to the position. You will have observed in the views presented that the flames were communicated to the so-called fire-resisting buildings from the outside through the windows and doors. There are now available practical devices to safeguard such openings which may be adapted to the varied circumstances of each case.

2. *Adequate protection to columns and other structural members.*—You will have noted how utterly in some cases the column protection failed, and in others how it succeeded in keeping the ironwork sufficiently under a certain temperature to prevent buckling; both hollow tile and metal, lath and plaster protection seemed to have been wanting when any long-sustained heat had to be endured. I am inclined to the opinion that concrete filled in solidly all round the column right up to the web is the best protection; but whatever it is it must be securely anchored to the column, and there must be no voids, and if brick or tile is used it must be backed up with good concrete or cement mortar filling up entirely the space, and no pipes must be hidden in the protection, as their expansion may endanger the casing, which in its turn will imperil the safety of the building.

3. *Avoid as much as possible the use of refractory materials for façades.*—It will have been seen that granite, marble, sandstone, limestone and similar building stones proved unsatisfactory materials for architectural effects. This, however, will be no argument against their use, for being deprived of the use of these materials, what is an architect to do?

Yet, knowing their inadequate fire-resistance and the better fire-resistance of all clay products, it behoves him to bear the fact in mind and avoid stone where damage might ensue by its employment for columns and piers carrying important points of support.

4. *Select a good type of floor construction.*—It will have been seen that the hollow tile floor construction failed in many cases by the expansion of the soffit causing it to split off and expose the cellular spaces. By a better construction of the tile this may be avoided in future, but the showing in the examples before us to-night has been more favourable to the reinforced concrete, and if this is executed in some form of "cinder" concrete or broken brick and the reinforcement well protected on the soffit by at least 2 inches of material I am inclined to pin my faith to that.

5. *Adopt partitions that do not expand.*—The hollow-tile partitions in the cases before us have not shown up very favourably. The reason is that when heated a large amount of expansion takes place, and bulging and eventual collapse is the result.

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The metal lath and plaster partitions were also failures, and we are led to fall back upon some form of reinforced concrete or concrete slabs, the thickness varying in accordance with their height. I am inclined to see in this material more satisfactory results.

These, gentlemen, are the principal points I would wish to emphasise; there are other minor ones with which I will not detain you, as I am afraid I have already exceeded my time, for which I must apologise and thank you for the patient hearing you have given me.

ART EXHIBITIONS.

AT the Leicester Galleries there are to be seen the work of three different and differing artists, Mr. W. Lee Hankey, Mr. W. Strang and M. Edmund Dulac. The best known of these is William Strang, A.R.A., LL.D., who shows by fifty examples his versatility as well as his skill, for they include oil paintings, water colours, dry points and drawings. The oil paintings furthermore comprise portraits, landscapes and figure subjects. Mr. Strang has a large following, and it will not be disappointed by the work here shown. Such canvasses as "The Red Fez," "From Cæsar's Camp," "Sir John Fisher," and "The Painter" can only add to an already high reputation; they are full of vigour and individualism. Etching has been a favourite medium of this Scottish artist, and the eighteen dry points exhibited are of great interest.

Goldsmith's "The Deserted Village" is a rustic poem that is crammed full of incidents and suggestions for a painter with an eye for pleasing groups. Mr. W. Lee Hankey has derived some forty subjects from it. There must have been difficulty in selecting the lines, inasmuch as the poem is made up of a series of quickly-succeeding word-pictures, each and all of which would justify the effort of an artist to transfer them on to canvas. Mr. Lee Hankey shows *himself* in a new light as a book illustrator. It would appear to be a profitable outlet for a painter's activities, judging by the number of artists who have undertaken it. The love for picture-books seems to be common to all periods of a person's life; perhaps even it grows with succeeding years and deeper appreciation. This characteristic would doubtless have been encouraged by the unknown poet who said in a sonnet "No nation can be truly great that hath not something childlike in its life of every day; it should its youth renew with simple joys that sweetly recreate the jaded mind." Goldsmith has found a worthy illustrator in Mr. Lee Hankey. The pictures show charm of thought no less than of colour, and the possessor of the new edition of "The Deserted Village" has obtained a source of pleasure that should never grow stale.

In the same room as the pictures inspired by "The Deserted Village" are a series of water-colours by M. Edmund Dulac, illustrating the "Rubáiyát of Omar Khayyam." Both of these works are therefore now offered to the public in a new edition, and they must be intended for adult readers if the price of the cheapest is any guide. Publishers evidently have found glorified picture-books a commercial success. Yet it seems scarcely possible there is sufficient demand for both M. Dulac's edition and for another one that has just been issued by a rival firm of publishers, and at half the price. The illustrations by M. Dulac have something of the suggestion of a mosaic. The Oriental atmosphere has been aimed at and attained. In sharp contrast to these pictures are his "Lyrics, Pathetic and Humorous, from A to Z." These can pretend to appeal to nothing but what is childlike in the nation, for they are nonsensical and irresponsible more than humorous. Each illustration should draw an indulgent smile, though they would probably quickly tire.

There is yet another picture-book to be seen elsewhere, viz. at the Fine Art Society's premises, where illustrations by Mr. Warwick Goble for "The Water-Babies" are on view. There is so much similarity in their two methods that it is impossible not to think of Mr. Arthur Rackham's work. This is rather unfortunate for Mr. Goble, for pleasing though his pictures are, they yet seem to fall short of the sparkling life of the other artist. On their own merits they are delightful. The subjects arise naturally out of the text. It often happens that books are illustrated in such a way as to suggest the artist thought very little about the meaning of the author, but a great deal about the opportunities for displaying his own cleverness. The reverse is the case with Mr. Goble; he has put Mr. Kingsley before himself, and for this alone he is deserving of credit.

OUR CONTEMPORARIES FROM OVER-SEAS

THE *American Architect* devotes an issue to domestic architecture, illustrating a quite English-looking half-timber house at Merion, Pa., by Mr. Horace Trumbauer, a rough-cast and tile-roof house at Bronxville, N.Y., by William A. Yates, also English in type, and two houses in New Jersey by Messrs. Davis, McGrath & Kiessling, which have an Italian flavour.

Deutsche Bauzeitung illustrates a typical modern suburban residence in the house of Herr Schröder built on the Marienburg, to the south of Cologne, and designed by Eugen Fabricius, architect. There is an interesting account of the construction of the grand stands for the racecourse at Grunewald, Berlin, and a fully illustrated article on the new church at Rheydt by Professor Dr. Johannes Otzen.

La Construction Moderne deals with the Rue St.-André-des-Arts in its review of old Paris, and illustrates and describes the new building for the Caisse d'Epargne at Rocroi, of which M. Octave Gelin is the architect. Illustrations are also given of the sculptured monuments to Houdon and Corot by M. Gasq and M. Larche respectively.

The Engineering Record gives an interesting account of the heating and ventilation arrangements of one of the American skyscrapers, the Ford Building, Detroit, an eighteen-storey building occupied as offices.

Stone illustrates the Government Post Office at Winnipeg, the Apthorpe Apartment House, New York, and the People's Trust Building, Brooklyn, as examples of fine work in stone. The latter, of South Dover white marble, is an excellent piece of detail.

COMPETITIONS.

Aberdare. — Sir W. Emerson and Dr. W. Williams, the medical assessor, have made the following awards in the competition for the proposed isolation hospital for fifty-two patients, including administrative blocks, outbuildings, &c.:—First premium (100*l.*), Mr. Edward C. H. Maidman, 31 South Charlotte Street, Edinburgh; second premium (50*l.*), Messrs. Stockdale, Harrison & Sons, and Mr. Howard H. Thomson, F.R.I.B.A., joint architects, Leicester; third premium (25*l.*), Mr. E. Montague Thomas, 37 Old Queen Street, Queen Anne's Gate, Westminster, S.W. The fifty-one sets of designs will be on view until the 12th inst. at the Girls' Higher Standard School, Gadlys Road, Aberdare.

Derby. — A special meeting of the Derby Education Committee was held on Monday in connection with the proposed local competition for schools on the Osmaston Road. A letter was considered from the Derby Architects' Society pointing out that the conditions were not in accordance with the rules of the Society, and that in consequence none of their members or of the R.I.B.A. would compete. It was asked that an assessor should be appointed by the President of the Royal Institute. This suggestion was refused by the Education Committee on the ground that they desired to make their own awards. The Committee finally decided to themselves appoint an architect to prepare the necessary plans.

Eltham.—In the open competition for Eltham Parish Hall the assessor, Mr. R. Lempriere Hesketh, F.R.I.B.A., selected the joint design submitted by Messrs. Moscrop-Young & Glanfield, and Percy J. Waldram, F.S.I., of Buckingham Street, Charing Cross, W.C., who have been appointed architects for the work by the building committee. Sixty-three designs were sent in.

The Bishop of Lichfield has made an appeal for contributions towards the restoration of the parish church at Clifton Campville, a village with an agricultural population of about 400 souls. The church is a fine specimen of the Early English and Decorated periods, with a nave and two chancels, south aisle with a chantry chapel, and north transept with a chantry chapel and priests' room over. It is 128 feet long and 48 feet wide. There is a well-preserved monument of Sir John Vernon, who died in 1545, and his wife in the chapel. At the west end an arch opens into the tower, which with its spire reaches a height of 160 feet, and is a landmark for many miles round. The fabric is much decayed. It has been surveyed by Mr. W. D. Caröe, who estimates the cost of immediate repairs at 3,000*l.* The sum of 1,000*l.* has been raised, and an additional 1,000*l.* was promised by the late Lord Burton if the balance is collected by December 31, 1909.

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The Architect.

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FORTHCOMING EVENTS.

Monday, November 15.

Royal Institute of British Architects: Paper on "The Planning and Laying-out of Public Places," by Mr. H. Inigo Triggs, F.R.I.B.A.

Liverpool Architectural Society: Paper on "Reinforced Concrete and Steel-frame Buildings," by Mr. F. E. G. Badger, Deputy City Building Surveyor.

Tuesday, November 16.

British School at Rome: Annual Meeting, Sir W. B. Richmond in the chair.

Institution of Civil Engineers: Discussion on three papers read at the meeting on the 9th inst.

Wednesday, November 17.

Manchester Society of Architects: Annual Dinner at the Midland Hotel.

Thursday, November 18.

Illuminating Engineering Society: Open Meeting, and Presidential Address by Professor Silvanus P. Thompson, D.Sc., F.R.S.

Friday, November 19.

Architectural Association: Paper on "Architecture of the Incas of Peru," by Mr. C. R. Enock, F.R.G.S.

RESIDENTIAL FLATS IN GERMANY.

THE modern tenement house or residential flat in Germany has received at the hands of present-day architects a very great amount of consideration, and undergone a development in planning quite as remarkable as the modified form of the "new art" movement has produced in grouping and detail.

An excellent view of this latest development both in planning of flat dwellings and in the modern German architectural treatment of grouping and detail may be obtained from a newly published book * by Herr ALBERT GESSNER, of Charlottenburg, an architect who has himself designed and carried out some of the most notable modern residential flats in Berlin. Although some of the author's buildings are illustrated, this book should not be considered a "one-man show," as the examples with which it deals embrace the work of thirty-three other architects, or firms of architects, and are chosen from all parts of Germany. Naturally most of these examples are from Berlin, or from the suburbs of that city—Charlottenburg, Friedenau, Gross-lichterfelde, Halensee, Pankow, Schöneberg, Steglitz, Südende, Wilmersdorf—for it is in the capital and its environs that the most striking developments of the German tenement house are to be found.

The author naturally treats of the necessity for and the advantages of the flat system of dwellings for large towns as they appear to the mind of a German architect, advancing the argument that the growth of cities necessitates the concentration of dwellings, and that this implies buildings of several storeys from which follows the flat-dwelling. Now how far is this argument tenable? The concentration of dwellings can be as stringently effected by the close packing of houses in vertical strips as in horizontal strips, and the density of the concentration is only limited by the demands of hygiene for a certain minimum proportion between building and air-space. If buildings are allowed to be high, healthy conditions can only be maintained by an increase of space between them, a fact clearly recognised in the preparation of the present London Building Act, so that as regards concentration there is, *prima facie* and presuming a correct relation to be maintained between building and air space, nothing to be gained by building high buildings with large spaces between them rather than low buildings closer together. Indeed, it is quite open to question whether, for hygienic reasons, it is not necessary that high buildings should be further apart in proportion to their height to maintain equally healthy conditions. Thus if houses 40 feet high are healthily placed 40 feet apart, the same proportion of cubic space would require houses 80 feet high to be placed 80 feet apart, but it is very doubtful if the inhabitants of the ground floor of the 80-feet houses would get as much fresh air as those in the 40-feet houses.

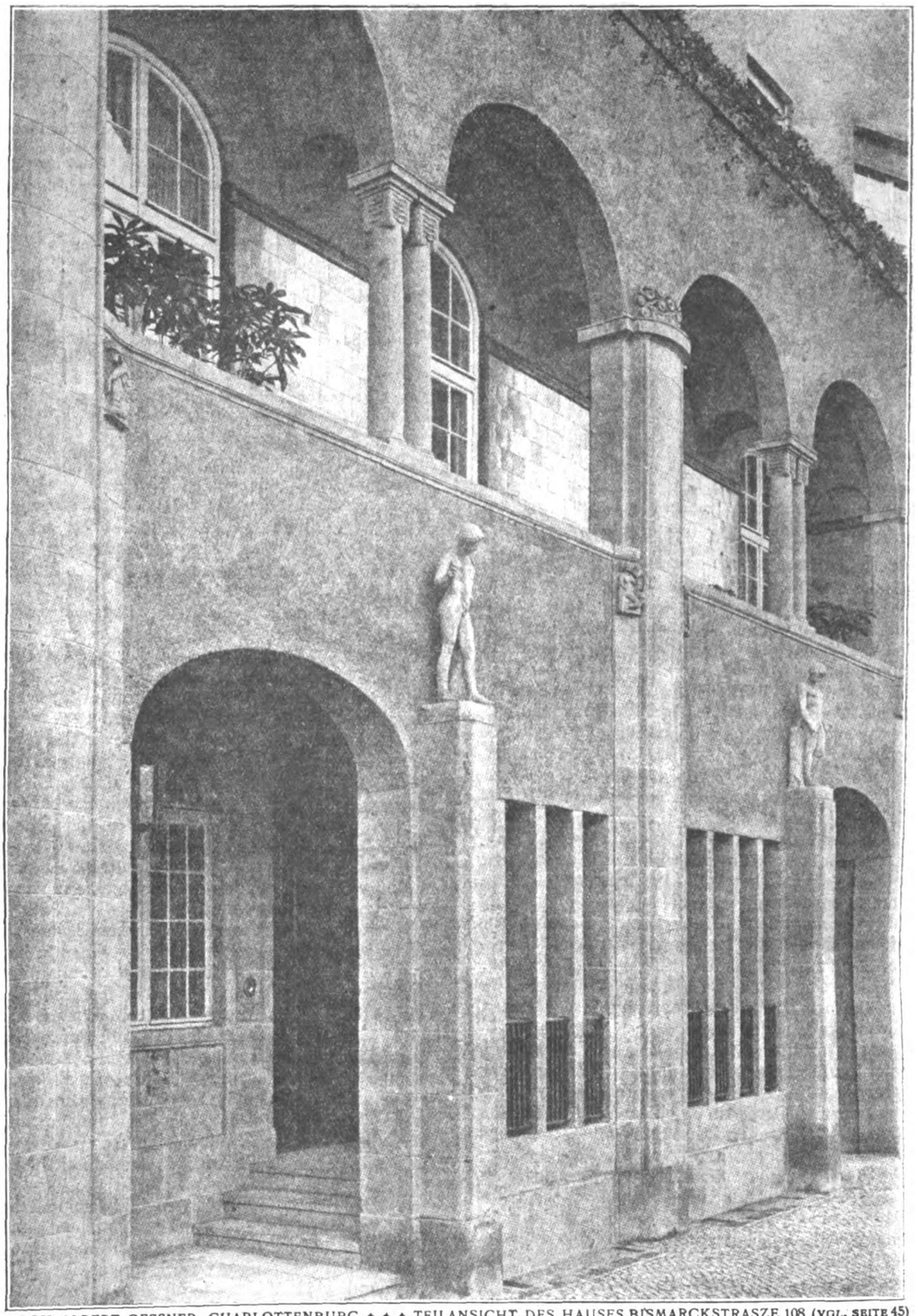
An advantage accrues to the high houses in their relation to ground rent when the necessary greater air space is provided by streets, parks or other public spaces for which ground rent is not paid, but if each house has to provide its air space from ground for which rent is paid, or which is its own curtilage, there is obviously no advantage in the high building over the low one in respect of economy of land. Nor as regards cheapness of building is there, as a general principle, any advantage to be gained by the lofty building. It is true that the roof, which is non-paying space and construction, covers a larger amount of accommodation, but against this there must be set the increased cost of the walls of the high building by reason of their greater thickness and the loss of floor area that they entail.

We must therefore seek for some benefit in other directions to justify the preference for dwellings in horizontal strips as favoured on the Continent rather than in vertical strips, as in our own country. The flat dwelling, when skilfully planned, has the merit of compactness and avoidance of stairs within the residence itself, thus economising labour in cleaning and waste of space in non-useable components. When the occupants have reached their flat they have no stairs to mount so long as they remain at home. The fact that the desire to avoid running up and down stairs is largely a factor influencing the preference on the Continent for flats is shown by restriction of the height of tenement houses to three storeys in the case of small dwellings of three or four rooms and kitchen, and the avoidance of greater height except when the scale of the house is sufficient to pay for the cost of lifts. Judging from the examples illustrated in the book before us, it may be taken as a general rule that in modern German tenement houses, ground, first and second floors are alone expected to pay unless a lift is provided. Cellars and attics in the roof for storage may be an accompaniment, but virtually the smaller houses are no more than three storeys high.

Other advantages of flats which have recommended them to Englishmen as well as to Germans are the simplicity of paying with one's rent for rates, taxes, water and other etceteras that bother the householder. In some of the German modern tenement houses heating is supplied from a common source and paid for as part of the rent, an arrangement that much reduces the stringency of the eternal servant question. Not frequently but occasionally a restaurant is included in a block of German flats, but as a rule the residences are planned to be self-supplied in the matter of meals.

* "Das Deutsche Miethaus." By Albert Gessner. With 220 illustrations and plans. (Munich: F. Bruckmann A. G. 8s.)

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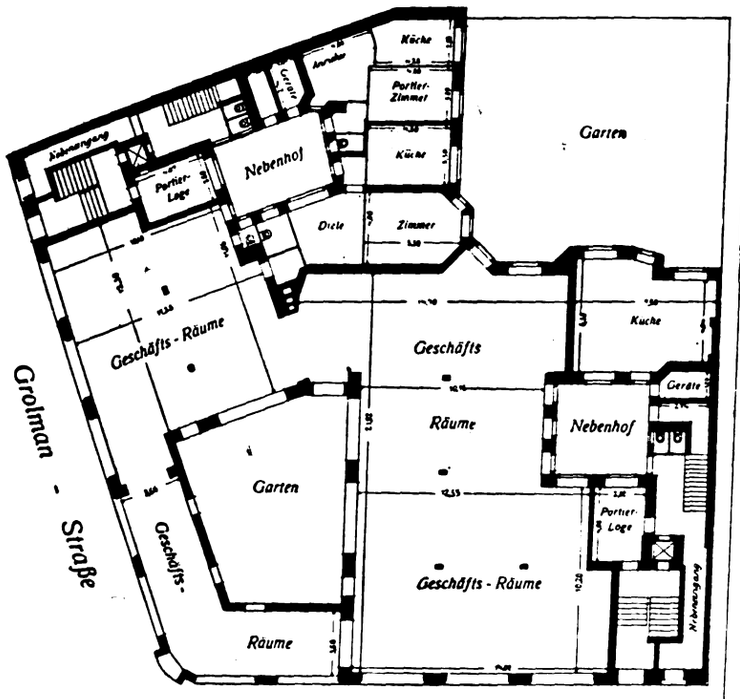


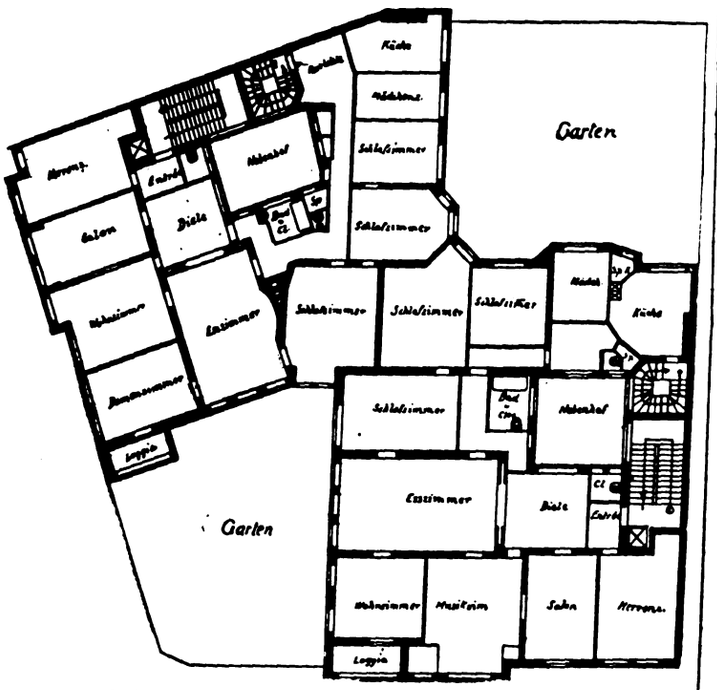
ARCH. ALBERT GESSNER, CHARLOTTENBURG ◆ ◆ ◆ TEILANSICHT DES HAUSES BISMARCKSTRASZE 108 (VGL. SEITE 45)

German architects of the present day in their designs for flat-residences or tenement houses have made strenuous efforts to get away from the barrack-like monotony of plan and elevation that has seemed to be during the last century an inseparable accompaniment of this class of dwelling. Of loggias, balconies, oriels and bays some or all are provided on each floor and for every suite, and by counter-changing these features variety and differentiation are given to similar suites on different floors as well as to the elevational treatment. The balcony or its modern German development, the loggia or recessed balcony, is regarded as so important an accessory of the flat that the author lays it down as a general principle that the kitchen should always have a balcony. As the German town-dweller, unlike the Frenchman or at least the Parisian, is a garden-lover, the modern blocks of flats in Germany are usually planned so as to include within the curtilage garden-courts and frequently small roof-gardens over lower floors, a device that has had exemplars in our own country.

It is needless to say that this book, being an exposition of the work of the advanced school of German domestic architects, the external architectural treatment follows the latest development of the "new art" movement, always interesting if not perhaps what we may consider uniformly successful.

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ARCH. ALBERT GESSNER. GRUNDRISSE DES HAUSES BISMARCKSTR. 109.

[From *Das Deutsche Miethaus.*

NOTES AND COMMENTS.

THE President of the Society of Architects was fully justified in his opening address last night in laying stress upon the overwhelming majority of opinion amongst architects generally in favour of registration, and in his deduction that the policy recommended for adoption by the Registration Committee of the Institute is not one with which the general body of its own members is in sympathy. The position of affairs within the Institute appears to us to be this:—The majority of members, although in favour of registration, recognise that the minority includes many of the foremost architects and artists in the profession; that it embraces, in fact, all architects who are members of the Royal Academy, and therefore all those who aspire to become members of that body. It is also recognised that those architects who have attained the front rank have done so not only by reason of their ability as artists, but by their ability as men of business, and it is presumed that those who have managed their own business successfully can manage well the business of the Institute. Therefore when the scheme of Licentiates is brought forward and the ideal of universal inclusion of all real architects within the ranks of the Institute is propounded by the minority, the majority, however dubious they may be as to the success of the scheme or the attainment of the ideal, have sufficient tolerance to give the minority a chance. If the minority fail, as we agree with Mr. BOND in thinking they will fail, in approaching anywhere near the ideal, then we feel sure the voice of the majority will be heard in no uncertain tones insisting upon some such measure as the Society of Architects has been advocating for the last quarter of a century.

A GOOD opportunity of viewing some highly interesting relics of old English architectural art and crafts is afforded by the sale, which will take place next week, of the collection belonging to Mr. JOHN FORD, F.S.A., Deputy-Lieutenant of the County of Middlesex, at his house, Old Park, Enfield. There in the gardens are life-size lead figures and marble vases, stone ornaments from WREN'S City churches, palisading from the old South Sea House, iron gates and marble vases from the old palace at Theobald's Park, stonework from old Burlington House, Piccadilly. Inside the house are old English silver and pewter, and furniture by English cabinetmakers of the seventeenth and eighteenth centuries.

THE annual report of the Council of the Manchester Society of Architects is of a very satisfactory character. The membership has increased, and the accounts show that there is a balance of income over expenditure of 45*l.* 18*s.* 5½*d.* The activities of the Society are in many ways notable. It maintains a club for members, with a billiard table and billiard handicaps, and makes a profit out of its catering of a quite useful amount. In this respect it sets an example to the Royal Institute. It does for its students what the Architectural Association does for London students. It takes an active part in fighting the battles of architects in its own district and in bringing pressure to bear upon local authorities in matters of professional interest. The following papers are arranged to be included in the syllabus for the current session:—"Ancient Lights," by P. M. OLIVER, B.A.; "Workmanship," by HENRY WILSON; "Concrete and Concrete Tests," by A. E. CORBETT, A.R.I.B.A.; "Truro," by Professor S. H. CAPPER, M.A., A.R.I.B.A.; "Town Planning," by Professor S. D. ADSHEAD, F.R.I.B.A.; "Draughtsmanship," by PAUL WATERHOUSE, M.A.; "English Castle Building," by J. T. HALLIDAY, A.R.I.B.A.

THE London County Council has agreed to grant to the University and City Association a lease of Crosby Hall, when re-erected by the Association, for a term of 500 years at a ground rent of 1*l.*, and the agreement provides that the Hall shall be open to visitors daily from 2.30 P.M. to 4 P.M. from October 1 to March 31, and from 2.30 P.M. to 5 P.M. from April 1 to September 30, and that, in addition, when students are in residence the Hall will be open on three days a week from 11 A.M. to 12.30 P.M., and during the vacations from 11 A.M. to 12.30 P.M. daily, and during the long vacation (July to October) from 10 A.M. to 12.30 P.M. daily. The Association will have power to close the Hall temporarily for the purpose of exhibitions on giving notice in the public Press. As the foundations have now been put in, it is probable that the old Hall will be re-erected and completed before very long.

THAT restoration and repair may be too conservative in the case of ancient buildings has been shown by the recent fall of a portion of the Norman string course

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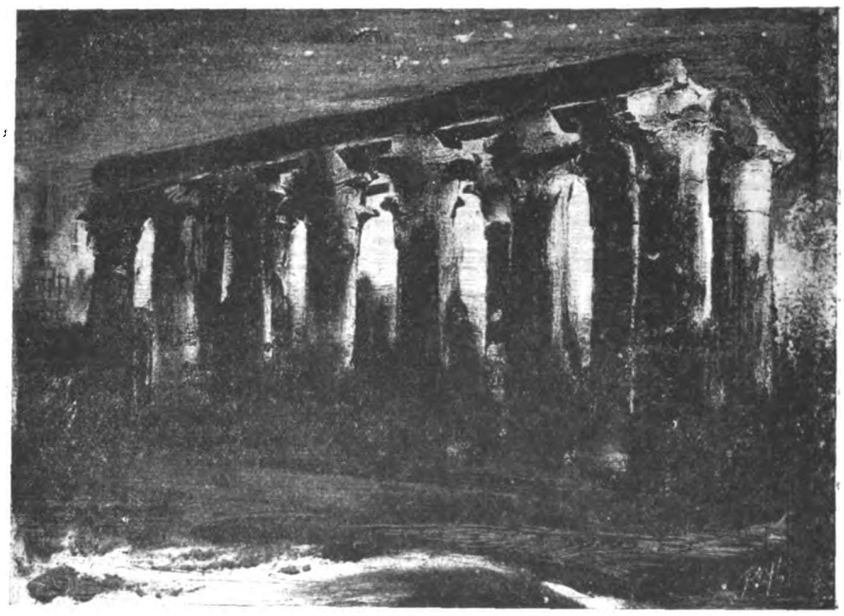


FIG. 44.

of the south tower of Exeter Cathedral. Dean MARLBOROUGH, in a letter to the *Western Morning News*, expresses the fear that the restoration was not sufficiently drastic, and that in their anxiety to preserve as much as possible of the old stonework the repairers have stayed their renewal too soon. This is one danger that always threatens those who have the care of ancient buildings, and postponement of repair in deference to the views of certain enthusiasts may very readily lead to injury to life and limb and to irremediable damage to the fabric.

ARCHITECTURE: ITS TRUE PRINCIPLES.—XXII.

By R. OWEN ALLSOP.

CLIMAX.

OUR business being with the general massing of buildings, we deduce from the foregoing considerations that concentration as a principle leads to *compactness*—as a rough-and-ready term—in grouping.

We continually employ the expression a "straggling" building, as we also commonly talk of a "rambling" plan. The prime cause of both these delinquencies in architectural composition is diffuseness, and that is *want of concentration*.

The loss of this compact character is seen very plainly in the outline of buildings. A good outline requires that the several features shall be well *bonded together*. Only in this way is unity gained. The straggling outline is the outline of a conglomeration—the sky-line of part of a town or city—picturesque itself, but wanting in any relativeness to the whole composition—wanting in unity.

The eye rests on the position of concentration. Plain wall surface is called a "relief"—rightly enough in the sense employed. But plain surface such as a breadth of brick-work or monotonous plaster of itself affords no relief *to the eye*. The eye rests on a point—large or small. It wanders about the plain surface seeking, in nautical language, somewhere to "come to an anchor," for a time. The action of the eye may be exactly compared to the wanderings of the bee—it ever moves restlessly from point to point until the eyelids are closed. The flight of the bee is from flower to flower—from point to point—and consideration will show that the eye is equally restless. What "plain wall surface" is to the eye, the intervals between flower and flower are to the bee. If it be thought that this is not so, it may be that it is considered that we can look fixedly at a plain surface and do habitually do so. It will, however, be found that the mind is here either in a state of thought-abstraction or that a half state of catalepsy is concerned. The eye, then, moves from object *to object*, and highly concentrated and condensed parts of the design are its actual resting-places. These are the halting places—the flowers—and the contemplation affords either pain or pleasure, or, it may be, neutral emotions of varying grades. The taste of the eye is for infinite variety—either that or total oblivion in sleep; and no voluntarily operated organ of the body compares with the eye in ceaseless and restless activity.

The considerations we have just made are full of the widest import in æsthetics. If the eye seeks infinite variety and change, it can be understood how it must be always averse to rigid confinement such as by being led to run along harsh lines as hard, unbroken shadows; and one appreciates better the theory of the Doric guttæ. The eye doubtless delights in curves even if the mind has a taste for ruggedness and angularity; any exception to the rule being readily accounted for by considering the mood of the beholder—a reflex action of the brain. But there is no more home in the desert than rest for the eye on plain, monotonous surfaces. The "relief" to the eye is not plain wall-surface, but the more enriched object that it flanks or bounds. The painter talks of "leading the eye" along a picture. The same consideration must be shown in architectural design.

Naturally, in viewing large and distant compositions our attention (the eye) is attracted by the several component masses which we proceed to examine. There is, however, the well-called *coup d'œil*—the whole composition—when we are at such a distance as will give us an embracing view. Here we must be chiefly impressed by the most dominant mass or masses; but, in the case of views at a moderate distance, the relative position of the component features—towers, domes, or otherwise—is what concerns the critical spectator; and that arrangement will be the most pleasing that least resembles equality and mathematical division.

Inequality, with unity, is the aim sought—it will be found on close analysis of the questions at issue. It so happens, therefore, that that concentration of work which is to be considered in matters of façade making must also be the prime factor in composing whole masses. The variety ever sought by the eye is thereby afforded.

The "one-principal-object" theory of composition—a sound theory—must therefore enter into the question of general outline. There must be no diffuseness—the

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outcome of the concentrative mind must be evidenced as concentration to the beholder. The reverse effect is required to that of the eye "jumping" round the teeth of a cog-wheel—*i.e.*, passing, on a tour of inspection, from tooth to tooth. This, to the eye, is worse than aimless wandering about a monotonous surface. One definition of the picturesque might fairly be no more elaborate than that it is variety offered to the eye, and the truth of this is a literal one; for variety is a wholly comprehensive term. It embraces variation on the variation to an infinite series.

Why, then, the principal object? Because variation is between extremes, and the greater the extreme the greater the variation. This necessitates plainly one extreme—in size and weight and importance. The extreme is therefore the dominant object—the important centre—the theme of the theme; for art knows nothing of dead-level equalities.

Without this arrangement of concentration or condensation, the eye would be restlessly revolving round and round the several monotonies of the equal-featured composition. With the concentrated feature, or the dominant object, we are offered a rallying point and a powerful arrester of the attention.

(To be continued.)

THE SOCIETY OF ARCHITECTS.

AT the meeting of the Society of Architects held last evening, the President, Mr. George E. Bond, J.P., delivered the following address:—

In entering upon the duties of President of the Society of Architects for a second year, my first desire is to express my warm appreciation of the honour conferred upon me by my fellow members, and to assure them that I shall endeavour by careful and painstaking attention to the duties of the office, to merit this renewed token of their confidence.

Never before in the history of the Society have the responsibilities of management been so great as they promise to be during the ensuing session, but I am confident those responsibilities will be accepted cheerfully and borne willingly by the very able and energetic body comprising officers and members of Council now charged with the direction of the Society's affairs. I sincerely hope that at this time next year your President will be able to congratulate the Society upon the consummation of the Council's efforts to provide for its use a permanent home, with adequate and suitable accommodation to meet its ever growing needs. The provision of such a home will, I am sure, prove to have been a wise and progressive step in the evolution of the Society.

The twenty-fifth annual report of the Society has been in the hands of the members during the last month, and its perusal must have given great satisfaction, for though it records nothing of a startling nature it shows a year of steady and continuous progress.

Notwithstanding the very general depression in the building trade, which necessarily affects adversely the position and prospects of architects, our balance-sheet is a favourable one, and the work of the Society is evidently appreciated by the profession generally, from the fact that sixty members, two honorary members and forty-two students have been added to the register during the past year, and that, after allowing for deaths, resignations and removals (which, owing to the depression have been abnormal), there is a net increase of twenty-five. Present conditions with regard to membership in another architectural body justify me in predicting a much larger increase during the ensuing year to the Society.

There are several points in the report to which I should like to direct your special attention, the first being that in connection with the students' section.

I am confident that every member of the Society must feel, that even were he unable to secure any personal advantage from his membership, his subscriptions to the Society are amply justified by the fact that they enable the Council to encourage so many of the younger members of the profession to more fully equip themselves for the proper performance of their future work. Upon the students of to-day will devolve the duty of maintaining the honour and dignity of the profession in the future, and anything we can now do to encourage *esprit de corps* among them, to check the present selfish spirit of every man for himself, as exhibited by the steadily growing evil of scheming, and unfair and indecent touting for architectural work, must ultimately tend towards maintaining that honourable conduct which until recent years was one of the distinct characteristics of the architect. I submit that the present organisation of our students' section, under which it elects its own chairman, secretary and committee, holds distinct meetings and makes its own arrangements for sketching tours and social functions, is eminently calculated to secure the object we have in view.

In no other section of the Society's work has so much progressive development been achieved, the past session having been from a practical point of view the most successful one we have known. With Mr. Emerson as its chairman, and Mr. Margary as its indefatigable hon. secretary, four very instructive sketching tours to interesting architectural centres were arranged, and largely taken advantage of by the students, who in each case were accompanied by members of your Council, some of the results of which we had the opportunity of seeing on Monday evening last at St. Bride's Institute. The visits to the Building Trades' Exhibition, the London timber docks, and to Messrs. Lawrence & Sons' brick and tile works at Bracknell, were also largely attended by both students and members, and without doubt added considerably to the knowledge of all taking part.

On the other hand the correspondence classes, conducted by Messrs. Bartlett and Mead have hitherto been but a moderate success. Your Council, however, by offering prizes to those securing the best positions in the first, second and third years' courses respectively, hope to attract a class of correspondents, earnest and conscientious in their desire for improvement in the practical details of their work.

Of the various competitions, that for the travelling studentship, as usual, attracted the larger number of competitors, and the submission of some really excellent designs for a secondary school, all of which were exhibited in this room, and subsequently at Birmingham and Cardiff, where they attracted a great deal of close and critical attention, and received high commendation. You will agree that this section of the Society's work deserves all the encouragement your Council can give it. No scheme of the kind can be perfected at once, but its development in a comparatively short time from a small and unimportant beginning, to its present position, leads one to hope that within the next few years we may be able to discover means of further developing its sphere of usefulness.

Next, I would refer to the question of new premises. The continually increasing work of the Society necessitated the formation of a larger General Council, and more frequent meetings of the various standing committees, with the result that our present accommodation was found to be utterly inadequate; the library has very considerably outgrown the space we are able to allot to it, the room in which it is housed is also our only available committee room, and frequently at the practice committee meetings there is not room round the table to seat the members who attend, and of course, an important committee cannot perform its duties to the best advantage under such conditions. Acting, therefore, upon the advice of a sub-committee appointed for the purpose of inspecting various premises offered, your Council has entered into an agreement for the lease of No 28 Bedford Square, where, subject to some alterations, accommodation already exists for all the Society's present needs, with the further advantage that there is at the rear a space sufficient for the erection of a large assembly hall, plans of which have already been prepared. Your Council, however, feels that after meeting the liabilities incurred by the purchase of the lease, and the execution of the necessary alterations and repairs, the funds available are not sufficient to warrant further expenditure upon the erection of the hall at the present moment.

Mention is made in the report of the Architects' Benevolent Society, and as your representative upon its Council, may I commend it to your notice; it is doing a good and necessary work in an unobtrusive manner, and is fully deserving of your generous support. It is to me a matter of regret to find in its register of subscribers so few names of members of this Society. May I hope for amendment in this respect? As a Society, we only subscribe five guineas per annum. This is, I submit, not very creditable to us, and I sincerely hope to see this amount considerably increased during this session.

Now, gentlemen, I must refer to that hardy annual, Registration. Although it has not been possible to have our Bill read in Parliament during the past year, all supporters of that far-reaching measure may congratulate themselves

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upon the fact that it has now passed beyond the academic stage, and entered the region of practical politics. This has been clearly demonstrated during the year by the large share of attention accorded to the subject at professional meetings, and by the professional journals both at home and abroad. We are able to record the first legislative success, in the cause of the registration of architects, which has been achieved in the British Empire; and we offer our hearty congratulations to our Transvaal brethren upon the consummation of their desires in this direction.

Early in the session your Council forwarded to the South African Branch of the Society a sum of 50*l.* as a donation towards the cost of promoting the Bill, which was duly introduced in the Transvaal Parliament in June, and referred to a select committee; its second reading was only opposed by some three or four members, whose remarks with reference to its working demonstrated clearly that they had not understood its provisions, and it ultimately passed the third reading without opposition. A Bill having the same object in view is now being prepared for submission to the Parliament of New South Wales, and as it is receiving the practical support of an united profession, we trust it will meet with similar success.

Three States in America, viz., California, Illinois, and New Jersey, already have statutory license or registration, and that its general working is satisfactory is evidenced by the manner in which leading practitioners have expressed themselves with regard to it; the general opinion being that the public is benefited by the rising standard of professional training and technical knowledge; and that the proper practice of the architectural profession is just as essential to the public welfare and safety as that of any other profession.

Coming nearer home, let us consider what has been done here during the year.

It will be within the recollection of all that in April last, *The Builder*, with a certain amount of success, secured a plebiscite on the question of registration, sending out some 5,500 stamped post cards for replies to definite questions. According to the first announcement 2,484 were returned, showing that half the practising architects in the kingdom were either too apathetic, or too uncertain about their own convictions, to write one word on a stamped post card; some qualified their replies; but the net result was that 2,113 direct votes were recorded in favour of registration, against 264 direct negatives, almost exactly eight to one in its favour; subsequently ninety-nine further replies were received, divided again in about the same proportion, and this practically agrees with the result of a similar plebiscite instituted by your Council some six years ago.

In their attempt to secure the opinion of the profession, the proprietors of *The Builder* sent out with the post cards 5,500 free copies, containing a leading article with quotations from our Bill as last printed, with comments thereon.

With your permission, I should like to consider this article in detail; firstly, because it contained arguments for and against the Registration Bill, to guide the reader in the exercise of his vote; and secondly, because the article with its quotation from the speech of Mr. E. T. Hall represented very fairly and fully the expressed opinions of all opponents of the measure with whom I have spoken, and was evidently intended to demonstrate the superiority of the policy advocated by the Institute. Therefore, in meeting this presentation of the subject (which I think was stated as impartially as we could reasonably expect, from one whose general conclusions proved clearly that he was not in sympathy with either the Bill or its promoters), we may assume that we are dealing with some of the strongest points of our opponents.

Firstly, let us note, the writer did not advance a single argument against the central principle of the Bill; but he made one very significant admission, when he said:—

"We recognise that while the reasons in favour of the measure are mainly practical ones, the objections to it are mainly objections of sentiment."

And referring to the clause which reads as follows:—

"An applicant for admission after the passing of this Act must not be less than twenty-one years of age and must, except in cases hereinbefore and hereinafter mentioned, have served as apprentice for not less than three years with a registered practitioner, or practitioners, and have passed such examination or examinations as the General Council shall authorise,"

the writer says:—

"That is the best provision in the Bill, and could have nothing but a good effect."

But that is our Bill; that is the principle for which we are fighting; every other word, every other line, contained in the Bill is but subsidiary to the carrying out of that principle, and if the effect of its universal adoption could be nothing but good, I ask why it is so persistently opposed by those who profess to have the welfare of architecture so much at heart—by the very select band of architects which the leader writer of *The Builder*, in a subsequent article, ventures to call the makers of English architecture of to-day?

Following the train of thought induced by a careful reading of his adverse arguments, we can readily recognise two of the sentimental objections both he and other opponents have to the measure; the first being, that under its provisions certain powers and privileges would be handed over to the suggested General Council, which he and they think ought to be exclusively vested in the Council of the R.I.B.A.; and the second, that Parliament following its usual procedure with regard to the creation of monopolies, would protect the interests of all those persons who, though not possessing the usually recognised qualifications, shall be at the time deriving an income from the practice of some of the lower forms of work usually performed by an architect; with the result that in any Registration Bill which it is possible to pass through the House of Commons, conditions would be imposed compelling recognition of the right of such persons to have their names registered in the same list with duly qualified architects, and thus lowering the prestige and status of the profession. In support of the position thus taken up he quotes Mr. Edwin T. Hall, chairman of the registration committee of the R.I.B.A., who in a speech to that committee said:—

"The object was to collect into the R.I.B.A. all qualified architects, and then to apply to Parliament to give them a legal diploma and legal titles. When this had been brought about, it was decided, and it was recommended, that in future admission should only be by a compulsory training upon lines to be settled by the Institute, and by compulsory examinations. When this was done with all the accompanying publicity which of necessity would arise from it, it was felt that those who were outside, the unqualified men, might be left alone; people might go to them just as they now go to medical quacks, but in no other sense would they be in the course of a few years a factor that need be taken into account. The advantages of this scheme were generally felt to be that instead of giving titles to unqualified men, and so to that extent lowering the immediate prestige and status of the profession for a time, they could proceed at once on an upward course."

The writer of the article considered this "a very reasonable and sensible position, and worth the serious consideration of the profession."

We may fairly assume that Mr. Hall's remarks may be taken as the concentrated essence of the opinions of all his supporters on the Committee, opinions arrived at after serious discussion, and that it was possible after any kind of discussion to arrive at and deliberately express such opinions only proves how, by continually and doggedly looking at a subject from one point of view, our mental vision may become contracted to such an extent that the perfectly obvious from other points is unseen and unrecognised. Of course this may apply equally to ourselves.

But let us give the statement the consideration the writer suggests it deserves. "The object was to collect into the Institute all qualified architects." This implies, of course, that the Institute is the proper body to be entrusted with the solution of this serious problem, and I am sure all our sympathies would run in that direction if only the Institute would rise to the occasion and adopt some practical scheme of compulsory training and examinations *for all*.

Well, the object is to collect into the Institute all qualified architects; but how is it proposed to attain that object? We may assume that, at a moderate estimate, there are at least 3,500 practising architects in the kingdom who are not direct members of the Institute, the majority not being members of any society; and of this number, we may safely estimate, at least 500 possess qualifications and social status equal to those of the average Fellow, many of them being men of long and honourable standing in the profession; and until quite recently such men had the opportunity of submitting themselves as candidates for the Fellowship class, and after satisfying the Council they might (subject to the will of the junior members) have been duly elected members with all the prestige and privileges of that class, but apparently these privileges were not a sufficient inducement; at any rate, the fact remains they have not joined, nor can they now join as Fellows. But

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the Institute has a broad-minded desire to admit all *bona-fide* architects within its communion. Yet, where the Fellowship class proved an insufficient inducement, they are to be collected into the Institute by being cordially invited to join a third-class rank, mere hangers on, paying smaller fees, and having fewer privileges than the junior class. Because they did not take timely warning and rush in before the gates were closed they must henceforth be content to occupy a lowly position, where they can be patronised by their juniors and in many cases by their assistants; is it possible to imagine a more absurd proposition? No self-respecting man could possibly join under such conditions unless he were compelled by statute, and as this is not proposed he will simply continue on his present lines, either as a respected member of some other society or as an unattached member of his profession.

So we may fairly conclude that as this large collection is going to be made *before* applying to Parliament for legal diploma and titles, Parliament will not be troubled in the near future.

But let us for the moment assume that it is possible to collect all qualified architects under such conditions, and that subsequently the Institute shall be successful in its application to Parliament. What would then be the position? Future admission would only be by compulsory training and examinations, upon lines to be settled by the Institute. This we quite agree with, and the question naturally occurs to one, why, if such training and tests are necessary to protect the status of the Institute and its members, they would not be equally beneficial if applied to the profession as a whole? One of the stock arguments of our opponents is that compulsory training and examinations will tend to stereotype art and kill individuality. But if these are essential parts of the policy of a body which places art before all other considerations, how can the Council of that body argue with any degree of consistency that such principles when promoted by another body would be productive of evil?

Then we are told that "all those outside the unqualified men may be left alone." The idea being that few people would resort to them in future. Does not such an expression of opinion prove decisively that the gentlemen who had the matter under consideration had not grasped, even in an elementary manner, the conditions which many provincial architects have to face and about which they are complaining?

Even in a part of my own district it will be safe to assume that two-thirds of the buildings erected have been carried out without the intervention of a recognised architect. In one year alone, as arbitrator appointed by the Court, I had to deal with three distinct cases, the aggregate costs of the buildings being 2,100*l.*, where the plans and specifications had been prepared by writers in H.M. Dockyard, and although in each case the building owner suffered pecuniary loss, such warnings were disregarded by the public and the same conditions continue unabated.

I recognise, of course, that difficulties would occur in dealing with such persons under our Bill as drafted, but not, I am sure, to the same extent. The concluding statement contained in the quotation from Mr. Hall's speech is:—

"The advantages of this scheme were generally felt to be that instead of giving titles to unqualified men, and so to that extent lowering the immediate prestige and status of the profession for a time, they could proceed at once on an upward course."

How is it possible to proceed at once on an upward course when it is proposed to leave unchecked the large army of parasites which is eating its way into our legitimate practice and compelling well-trained and qualified men, who must practise to keep the wolf from the door, to drop their dignity, slip into the arena and fight that army on its own terms, accepting the reduced fees and degrading conditions now frequently imposed both by public bodies and private clients? What cares such an army about "the accompanying publicity which would of necessity arise" from the Institute's action? The only way to check its growth and prevent further aggression is by imposing statutory tests of qualification.

With regard to the sentimental objection of giving titles to the present unqualified men, what practical difference can it make to the position? Such men now assume the titles, and they are recognised and resorted to by the building public, and are at the same time included with R.A.'s, F.R.I.B.A.'s, and A.R.I.B.A.'s in the various professional lists and directories; in fact, it is the objectionable persons who generally figure most prominently in such lists and whose names are also found in other directories and lists used by the public, but tabooed by the profession. One case I know of where in a well-known and professionally recognised directory arranged in districts and in alphabetical order, the first name in a certain place is that of a man who combines the practice of architecture with his business as a dealer in second-hand furniture; he occupies a double-fronted shop, the windows being filled with odds and ends of old furniture, and prominently on the centre of the glass, in china letters, I am able to read So-and-So, architect and surveyor. What can we possibly have worse than this in the immediate future, even under a thorough-going Registration Bill? Were such a Bill to pass to-morrow, then the conditions existing to-day would be the very worst, for it is my honest conviction that not one in ten of these objectionable persons would apply for registration. Thus the first list published under such an Act would be a very considerable improvement upon the lists now existing, and thenceforward further improvement would be effected gradually and continuously as a result of the removal of undesirables by the steady but persistent hand of time—compulsory tests preventing their further development.

Let me now summarise the arguments; we may then consider from a practical point of view how our position is affected by these later developments.

Firstly.—Considering the Registration Bill, we are told with regard to the suggested composition of the General Council, "The principle of selection is very fair and there is nothing to criticise in it."

Secondly.—The clause dealing with compulsory training and examination of future candidates for admission to the ranks of the profession (and this, I submit, is the soul of the Bill) is pronounced to be "the best provision in the Bill and could have nothing but a good effect."

Thirdly.—No arguments were advanced against the general principles of the Bill, but only against some of its details, and these I am sure we are willing to reconsider if our central principle is accepted; much was made of suggested difficulties in its administration in the event (impossible according to the writer's prediction) of it becoming law.

Otherwise we were told "the reasons in favour of the measure are mainly practical ones, while the objections are mainly objections of sentiment."

With regard to the alternative suggested by the Registration Committee of the R.I.B.A., I would say it is based upon the assumption that it is not only possible, but extremely probable, that all qualified architects now outside the Institute will within one year join that body. Join under conditions which imply that as undesirables they are as a class to be allowed to die out, and that they voluntarily acquiesce in this recognition of their inferiority, and are therefore willing and anxious to take advantage of the Institute's gracious permission, allowing them to practise for the time being as members of a lower grade upon the distinct understanding that they shall have no effective voice in its management. When I remember that some of the most respected members of the profession do not at present belong to any professional organisation, it seems incredible that there is now in existence a body of gentlemen whose sense of humour is so undeveloped as to be unable to realise the ludicrous nature of such a proposition.

As their further propositions are contingent upon the realisation of their wishes in regard to this, I will not add to the remarks previously made in reference to them.

The present position therefore may be stated as follows. The leading article we have been considering (with its quotations) was submitted to the readers of *The Builder* as some sort of guide to enable them to arrive at a decision upon the subject before voting. The result of the plebiscite was a vote of eight to one in favour of registration. One peculiar feature being that notwithstanding the Council of the Institute's strenuous opposition to our measure, we find that the total number of negative votes received (although many were from non-Institute men) represent only about one-eighth of the Institute's membership. Under such circumstances one is apt to wonder whether the policy recommended for adoption by the Registration Committee of the Institute is one with which the general body of its own members is in sympathy.

In a letter to *The Builder*, our Secretary, Mr. Butler, pointed out that a plebiscite had been taken both by the Society of Architects and *The Builder*, yielding very similar results, and suggested that the Council of the R.I.B.A. should now organise one, not only of its own members, but of the profession generally, and subsequently act in accordance with the results obtained. By following this course I venture to say the Institute would practically and satisfactorily justify its claim to speak for the whole profession—a claim all of us would be glad to see amply justified; any assistance we could render would be willingly placed at its service, as we are not only willing but anxious that this subject, which is of such vast importance to all practising architects, should be dealt with in a fair, just, and comprehensive manner by the senior body, for after all is said we only wish it to carry its own policy to a

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logical conclusion. Logic hitherto has not been a dominating factor in the framing of its policy; pure reasoning has had to contend at a great disadvantage with such incidentals as usage, sentiment, tradition, and, strongest of all, inertia. I submit that the advocates of the Registration Bill have the best and strongest arguments behind them, always stated fairly, honestly, and consistently, and should the R.I.B.A. take advantage of its present great opportunities and endeavour to meet in an adequate manner the general wishes, it will receive the practical support of an united profession, and incidentally add very materially to its own prestige and position.

COMPETITIONS.

Workington.—The Secretary of the Royal Institute of British Architects desires us to mention, for the information of architects proposing to take part in this competition, that the R.I.B.A. competitions committee is in communication with the promoters with a view to the amendment of the conditions of the competition for the Workington technical school.

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 20, MR. ERNEST NEWTON.

MR. ERNEST NEWTON has been one of our most prominent and successful domestic architects for many years now, and has worthily upheld the honour of being Mr. NORMAN SHAW'S first pupil.

NO. 21, MR. WALTER CAVE, F.R.I.B.A.

MR. WALTER CAVE has filled for two years the position of President of the Architectural Association, which is in itself a testimony to his popularity amongst the younger members of the profession.

DESIGN FOR A TOWN HALL AND MUNICIPAL BUILDING.

THIS building was designed for a provincial town, the site being a large public square with the main avenue on the south side. The entrance to the municipal offices has been planned off this avenue. The town hall has been placed at the back off site. The seating capacity is 800. Public galleries have been arranged, also large orchestra and organ. A feature has been made of a promenade gallery around three sides of hall for use during dancing. The original drawing, by Mr. BERTRAM LISLE, from which our illustration is taken, was exhibited this year at the Royal Academy.

HIGH SCHOOL FOR GIRLS, STOCKPORT.

THIS school is now in course of erection in Beech Avenue, Cale Green, Stockport. It provides accommodation for 200 girls and fifty pupils in the Kindergarten department, there being eleven class-rooms and three division rooms. On the ground floor in a central position there is a large assembly hall, which is panelled in oak to a height of 7 feet 6 inches. The reception hall, library and committee room, and head mistress's room are also finished in oak. In the east wing are provided a gymnasium, dining room, and cookery class-room. On the first floor music rooms and practice rooms are provided, well cut off from the ordinary class-rooms. A large art room and science laboratory are also arranged on the upper floor. The building is faced externally with Accrington bricks, with Darley Dale stone dressing, and the roofs are covered with Elterwater slates. The construction is fire-resisting throughout. The contractor is Mr. JOSIAH BRIGGS, of Stockport, and Mr. S. MELLOR is acting as clerk of the works. The architects are Messrs. SPALDING & SPALDING & ERNEST G. THEAKSTON, of 36 and 37 King Street, Cheapside, London, whose design was selected in the recent competition.

HOUSE AT KINGSTON HILL.—MAIN STAIRCASE.

THIS house is situated at Kingston Hill, on a beautiful site overlooking the Banstead Downs. It has been the idea of the architect to adopt the Georgian tradition. No attempt has been made to introduce features merely for the sake of picturesqueness, but reliance has been placed entirely upon simplicity and proportion to gain an interesting and dignified effect. A feature of the front, which is perfectly symmetrical, is the Classical arrangement of cornice and frieze, the latter being formed by the broad-framed first floor sash windows with their louvred green shutters. Externally the walls are faced with bricks of a soft red colour, and the roof slopes are covered with sand-faced, uneven weathering tiles. The main cornice is of wooden construction with carved medallion brackets. In plan the rooms are arranged for the most part symmetrically; the drawing and dining-rooms are divided by an oak portable partition, which permits of a sufficiently large room for dancing being easily formed when desired. The garden is approached from these rooms through a verandah, with steps leading on the terrace. The oak staircase and panelling in the hall are based in design upon examples of the later Renaissance period. Other decorative features are the rain water heads, designed specially by the architect. The decorative carving is by Mr. T. OSMUND, Old Street, E.C., and the metal fittings by Messrs. GEO. WRAGGE, and the Guild of Handicraft, Chipping Campden. Messrs. D. S. THOMSON, of Wimbledon, for the gardens. General contractors, Messrs. W. H. GAZE & SONS, of Kingston-on-Thames. Mr. A. JESSOP HARDWICK, F.R.I.B.A., was the architect.

COMPETITION DESIGN FOR ADDITIONS TO TOWN HALL, STOKE-UPON-TRENT.

IN Mr. GEORGE BLOORE'S competition design, the present entrance to Glebe Street is intended as the principal approach to the small assembly hall and judicial end of the court, to the existing assembly hall, and the banqueting and to both floors of the large hall. To this end the existing staircase is to be completely remodelled, and the new one will occupy a position slightly north of it, thus enabling the present wide corridor to be continued. All the exits are on to Corporation land and not on to the towing-path. The acoustic properties of the large hall have been carefully considered, and the sides of orchestra are shaped in the funnel-shaped form, wider at the end nearest the audience, thus delivering the sound direct into the large hall where the numerous openings surrounding the first floor break up the sound and prevent any possibility of echo. It has also been thought advisable to leave the trusses open to view for this purpose. They can be suitably decorated. Two portions of the front to Tower Street it is proposed to face with Hollington stone entire, while for the front of the circular hall and the circular portion of small assembly hall best red-brick and stone dressings might be employed. The front of the court to Aqueduct Street to be faced with red-brick and stone dressings. It is thought that red-brick would introduce a little bright colour contrast, and it retains its colour longer than stone in a smoky atmosphere. The remaining frontages for the most part would be faced with a good, sound red brick. The areas where narrow to be faced with white glazed bricks. The cubical contents of the whole buildings are 795,070 cubic feet, measured from the top of the concrete foundations to half way up the roof, and it is proposed to divide this amount into what may be termed high and low-price work as follows:—

The large hall and front entrances, assembly hall, two front spare-rooms, ante and all committee-rooms, new rooms for banquets, staircase, judge and court-rooms amounting to 562,750 cubic feet at 8*d.*, works out to 18,752*l.* The remaining buildings amount to 232,310 cubic feet which, at 6*d.*, works out to 5,802*l.* These total to 24,554*l.* Adding 1,000*l.* for organ as instructed, the total cost equals 25,554*l.*

In view of the large amount of empty spaces in the buildings, it is reasonable to expect that the most of the work would not exceed the amounts stated.

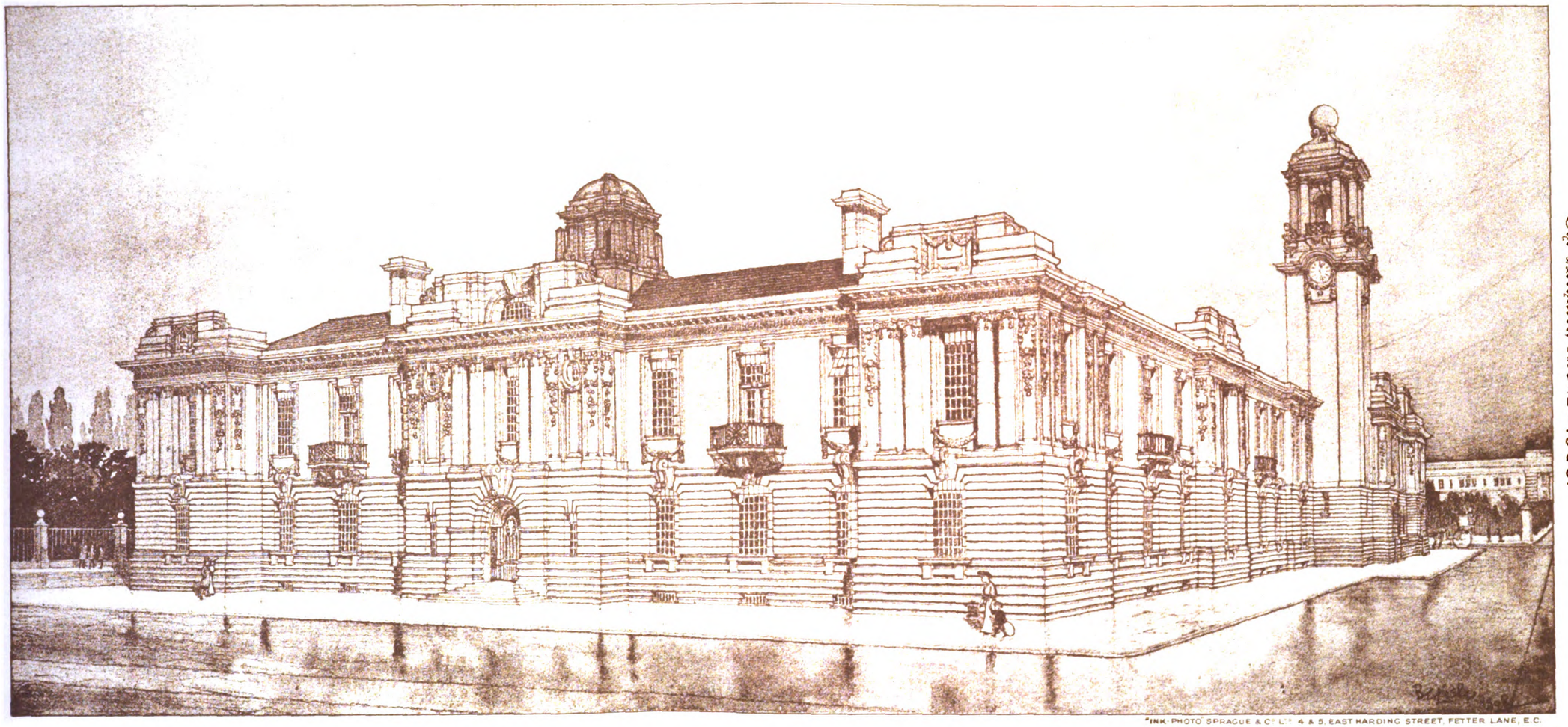
An Exhibition of Mr. Arthur Rackham's water-colour drawings, illustrating "Undine" and "Grimm's Fairy Tales," will be opened on November 20, at the Leicester Galleries, Leicester Square. There will be exhibited at the same time a choice collection of water-colours by Birket Foster, and a series of drawings of English rural life by Mrs. Allingham, R.W.S.

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DESIGN FOR A TOWN HALL AND MUNICIPAL BUILDING.

By BERTRAM LISLE.

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HOUSE AT KINGSTON HILL.

A. JESSOP HARDWICK, F.R.I.B.A., Architect

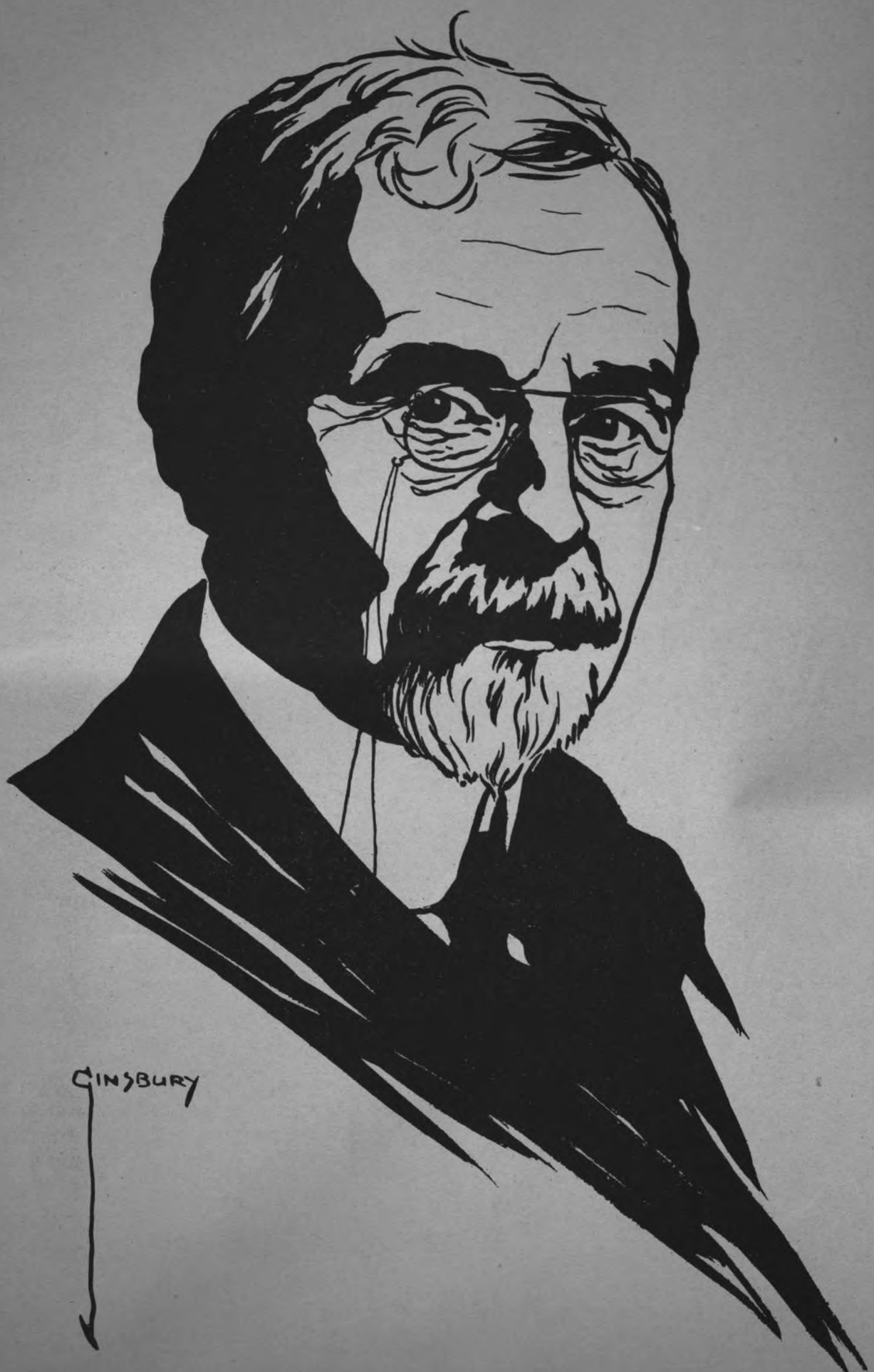
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HOUSE AT KINGSTON HILL.

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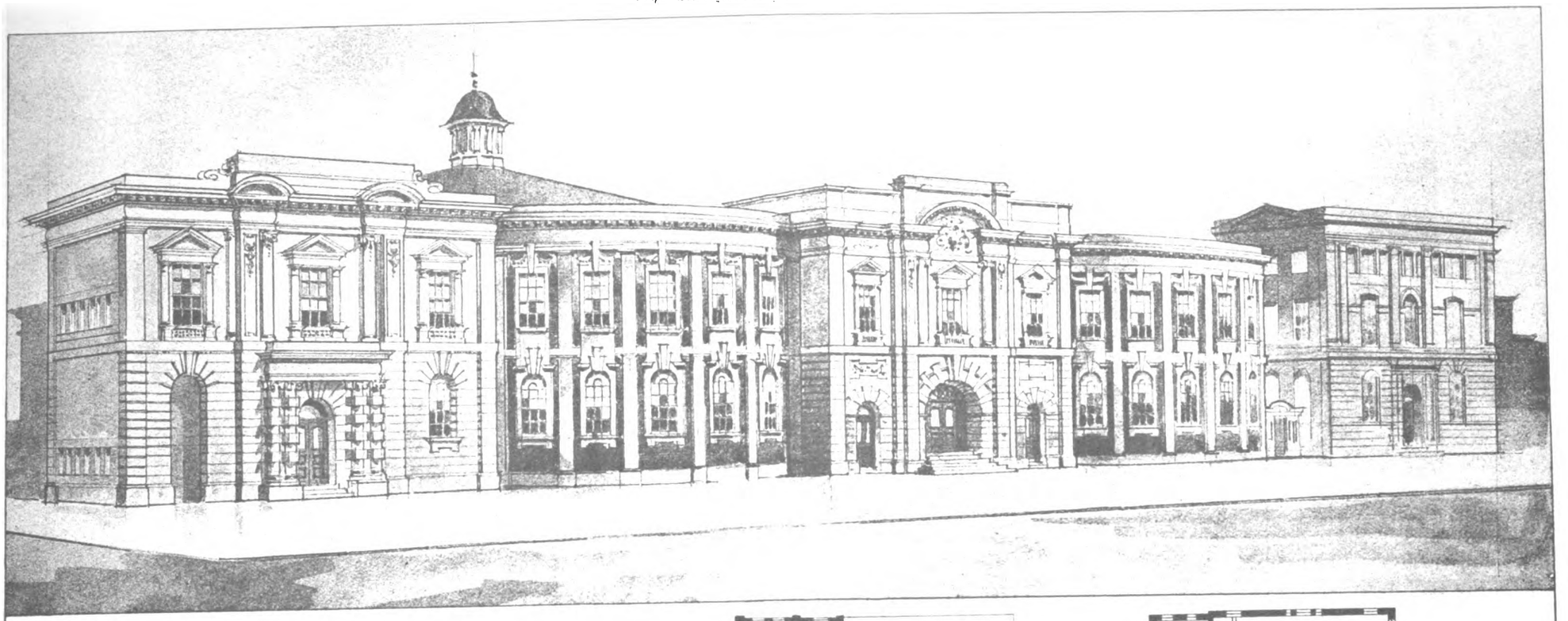
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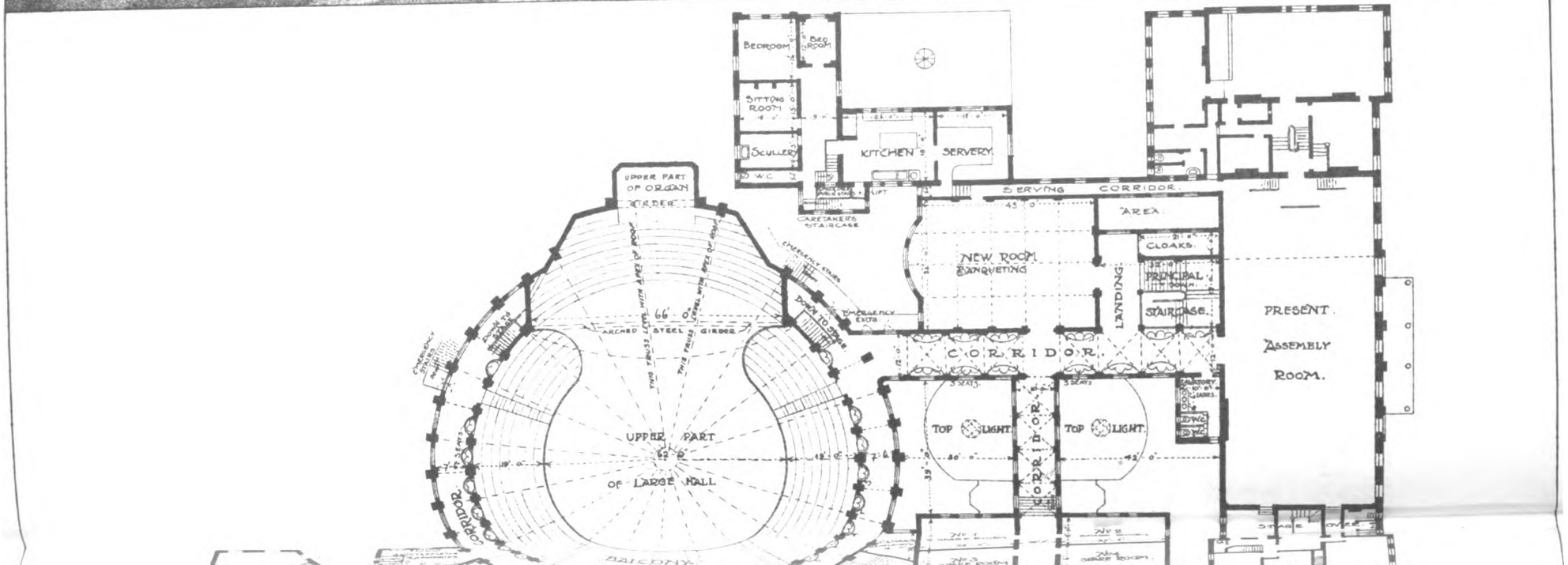


LIVING ARCHITECTS. No. 20: MR. ERNEST NEWTON.

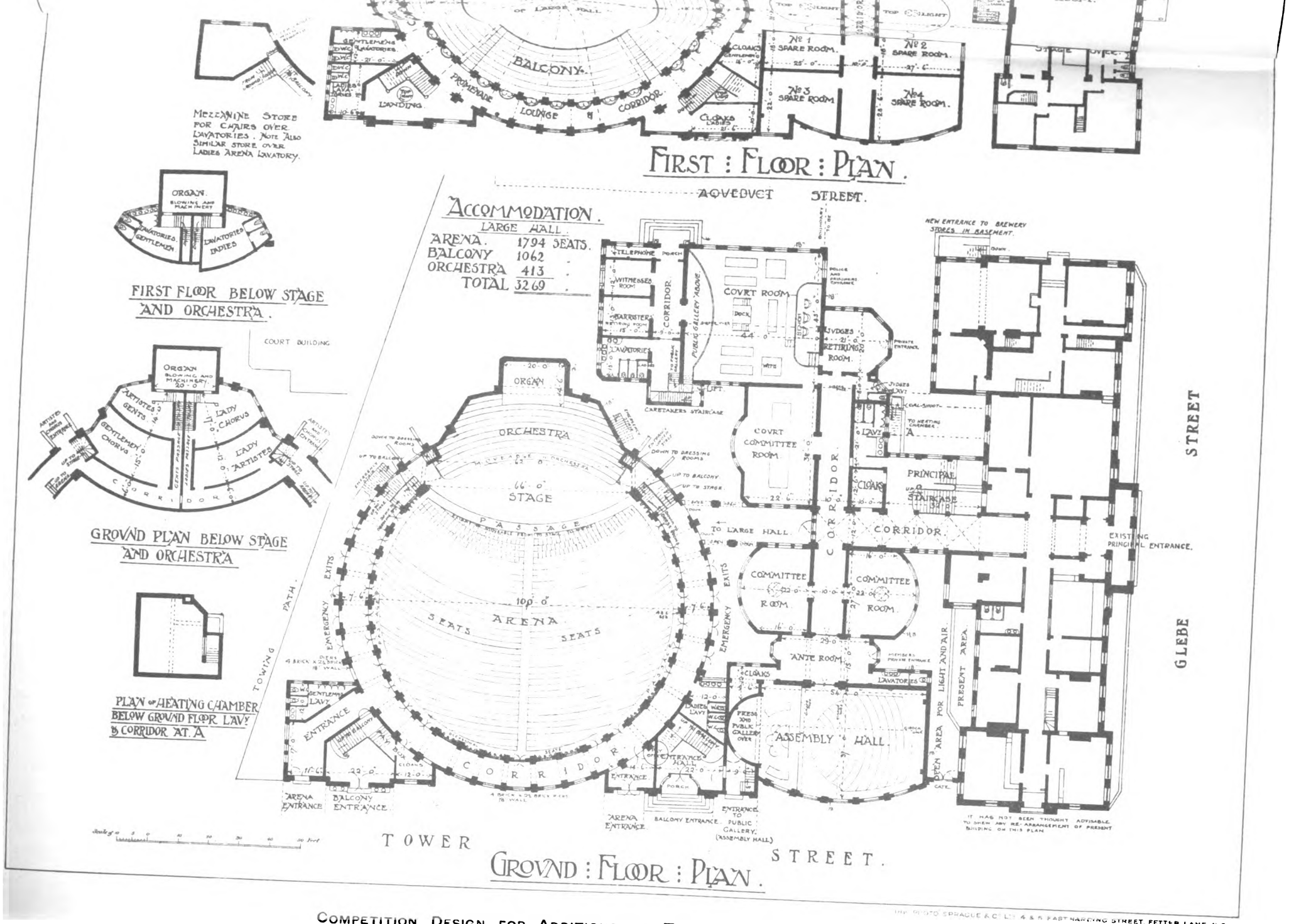
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COMPETITION DESIGN FOR ADDITIONS TO TOWN HALL, STOKE-UPON-TRENT.

By GEORGE BLOORE.

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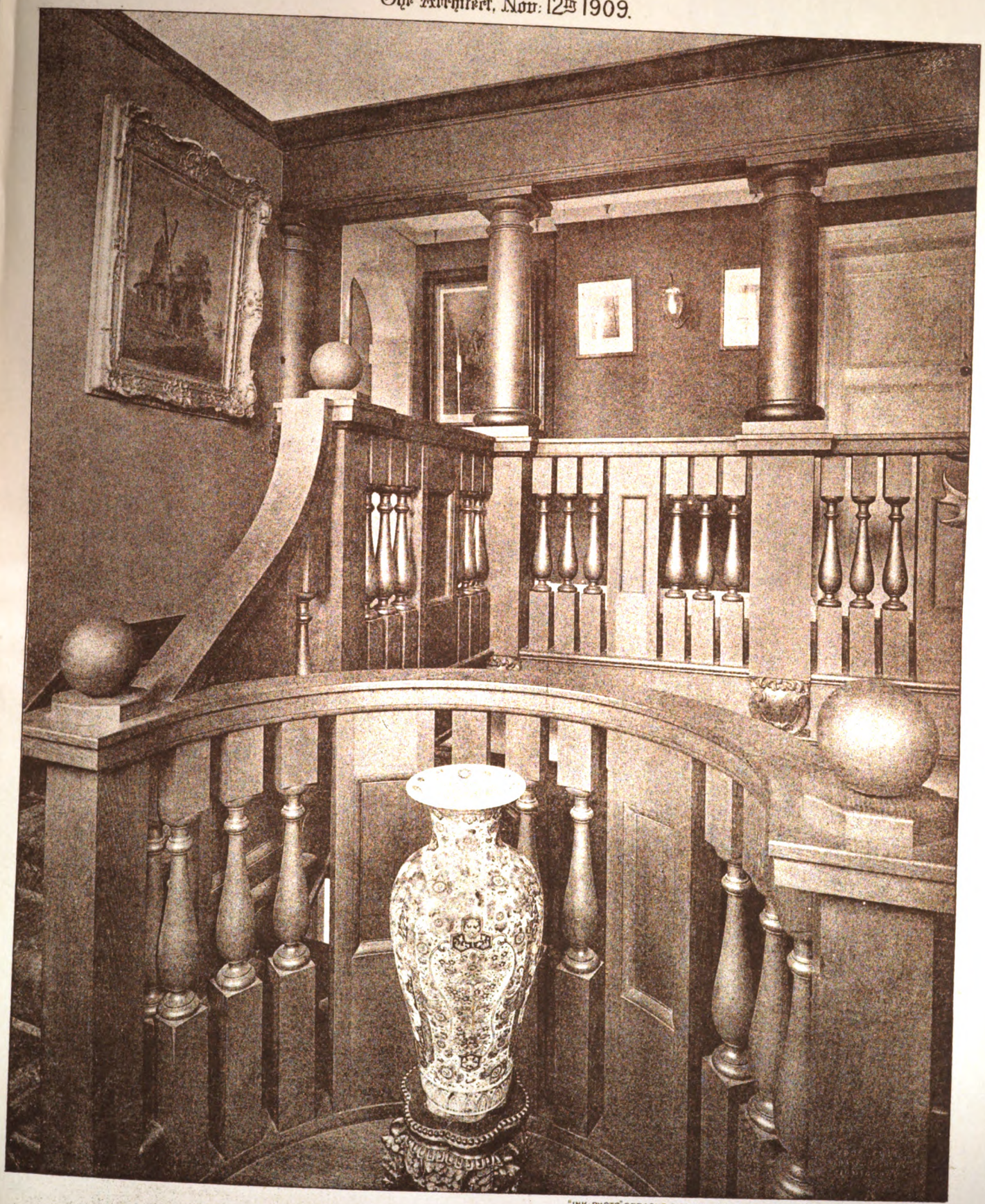


LIVING ARCHITECTS. No. 21: MR. WALTER CAVE, F.R.I.B.A.

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HOUSE AT KINGSTON HILL: MAIN STAIRCASE.

A. JESSOP HARDWICK, F.R.I.B.A., Architect.

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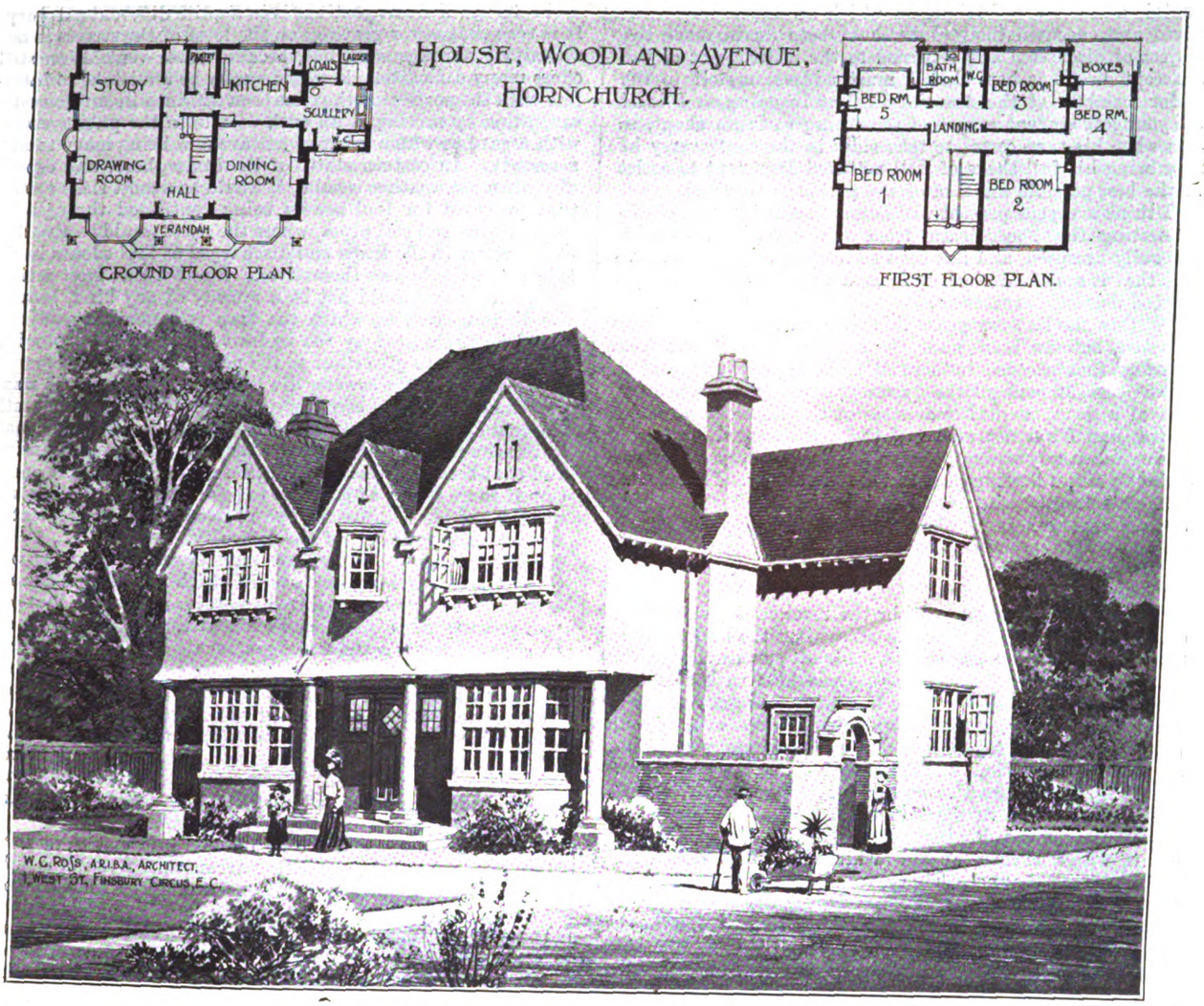
HIGH SCHOOL FOR GIRLS, STOCKPORT.

Messrs SPALDING & SPALDING and E. G. THEAKSTON, Architects

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HOUSE AT HORNCHURCH.

THIS house has been recently built in Woodland Avenue, Great Nelmes Estate, Hornchurch, Essex. It stands on a plot 88 feet by 300 feet. The external walls are rendered and floated in cement and sand, stippled and distempered buff. The woodwork is painted white, and the windows are casements divided with wooden glazing-bars. The columns on front elevation are cast-iron cased with expanded metal and finished in Keene's cement and painted. The roofs are covered with purple brown genuine Broseley tiles, and the chimney-caps and the yard wall are coped with the same tiles. The fittings throughout are good and the work has been well carried out by Messrs. EWINGS & WARE, builders, Stoke Newington, N. Mr. WALTER GRAY ROSS, A.R.I.B.A., of 1 West Street, Finsbury Circus, E.C., is the architect.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last at Tufton Street, Westminster, Mr. H. Tanner, F.R.I.B.A., president, in the chair.

The Hon. Secretary announced that the annual conversazione would be held on November 24, at 8 P.M.

The following gentlemen were elected members:—Messrs. C. Grellier, E. K. Rowe, H. M. Whitehead, A. B. L. Roberts, R. Williams, R. S. Cobb, N. A. Walton, J. Basevi, W. S. Peto, and the Hon. L. J. Fiennes.

On the motion of the President hearty votes of thanks were passed to Mr. James Williams for a donation of water-colour drawings by the late George Devey, and to Mr. Ernest George for six water-colour drawings.

Mr. W. D. SCOTT-MONCRIEFF read the following paper on

House Drainage and Sewage Disposal.

When I was asked to contribute a paper and read it before the members of the Architectural Association I accepted the invitation with the greatest pleasure, but when it came to writing I found the task was not so easy as at first appeared. The first difficulty that occurred to me had reference to the section of the Association that ought to be particularly addressed. As a teaching body, which is now its most important function, the students should have the first consideration, but they, after all, form only a small proportion of the total membership, so that the full-fledged architect could not be overlooked, and besides, there is a great distinction between the kind of address that is suited to the respective capacities of the first, the second, and the third year student. All things considered, I came to the conclusion that a somewhat discursive paper might best meet the case, and that for several reasons. To begin with, it is hardly advisable that such an opportunity should in any way take the place either of the text-book or the teacher. The subject of drainage and sewage disposal is so full of necessary detail that a single lecture is an altogether inadequate medium of instruction, and in domestic sanitation more especially there is nothing that can supply the place of actual practice and experience. The most carefully acquired knowledge from a printed book must always leave many points uncovered and difficulties unsolved when principles have to be put into practice, and it is for this reason that I would venture to suggest the necessity for students to be saturated with an understanding of the principles involved, so that when troublesome points arise, even if they are not settled in the best possible way, they will, at any rate, be disposed of without any disregard of the general conditions that are universally accepted as the essentials of success.

All this is obvious, and may be accepted as little better than a truism, but unfortunately we have to deal with cases in which principles that have long been accepted as funda-

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mental, and the very basis upon which architects have conceived and executed their plans, have been again made the subject of discussion and returned to the melting-pot of the unaccepted. It is here that I must address myself to the senior members of the Association, but in doing so I trust the youngest student may find something to think about, so that when his turn comes to take sides in the controversy he may bring his full share of well-matured argument to assist in the best possible solution of the problems involved.

I think everyone present will admit that the system of disconnecting the house-drain from the sewer has been so generally accepted, and has been so long in almost universal use, that it may be looked upon as a fundamental principle of good domestic sanitation.

Within the last few years this position has not only been attacked, but has been made the subject of argument from quarters that are too influential to be lightly disregarded. At the present moment the question is under the consideration of a departmental committee of the Local Government Board, and I am not aware of the architectural profession having taken any strong position as to their claim, their just claim, to take a leading part in the controversy. I think that architects are more interested on behalf of their clients, who are, above all others, the householders and ratepayers of the community, than any other profession, and I am afraid they hardly realise the extreme importance of the issues that have been raised.

Many years ago, but within the recollection of many of us, the only protection that existed against the dangerous intrusion of sewer-gas to the interior of our dwellings consisted of an unventilated soil-pipe provided with a D trap, connected to a pan-closet. The idea of making at some point a complete disconnection between the house-drain and the public sewer occurred to me, and no doubt many others, as an obvious precaution, but the honour of having put the proposal into actual practice and giving publicity to the system rests, I believe, with the late Dr. Fergus, of Glasgow, who made a manhole in his back garden on the line of his house-drain, where he fixed an old-fashioned form of trap with a disconnecting channel. This arrangement I saw myself more than thirty years ago, and I was keenly alive to its obvious advantages. Soon afterwards the arrangement first used by Dr. Fergus was improved upon by Mr. Buchan, who introduced an improved form of trap, which bore his name, and became widely adopted in connexion with an access chamber. This system of disconnection has remained, with a few changes in details, the standard arrangement ever since, and its adoption has spread all over the civilised world unchallenged until quite recently, when advocates have risen who almost demand that it should no longer be used and that the disconnecting house-trap should be definitely abandoned.

The first sign of revolt against this widely-accepted device of a disconnecting trap, so far as my information goes, came from the surveyor of one of the outlying London District Councils, who undertook the somewhat laborious task of making a systematic note of the actual working of several hundred disconnecting-traps in his own district and tabulating the results. It appears from this examination that the habits of the householders in that neighbourhood were, to say the least, somewhat peculiar, and seem to have been principally characterised by their indifference to the disappearance of their scrubbing-brushes, which the inspectors discovered in their disconnecting-traps. I think the obvious objection to making this information a ground for doing away with disconnecting-traps altogether is that it would not apply to other districts where the inhabitants are less indifferent to the disappearance of their domestic appliances and where a similar investigation would give totally different results.

The other argument used was of a very different kind, and consisted of a suggestion or claim or demand that the local authorities should be free to make use of the ventilated soil pipes of the householders as a means for solving the problem of sewer ventilation which surveyors have been unable to achieve in any other way.

To this proposal I think there are many serious objections, and the interests, as well as the principles, that are at stake are of such importance that I hope my referring to them very shortly will not be considered out of place. The argument that a certain amount of carelessness is unavoidable in the cheaper kind of houses occupied by people who are altogether indifferent to what goes on with their drainage, as I have said, disappears with the facts supporting it, and can carry no weight where the carelessness referred to does not exist. The other argument that the traps interfere with the use of soil pipes for the ventilation of the public sewers so as to avoid the use of street gratings is in a quite different category. It is true that sewer gratings on the level of the streets is not a sanitary arrangement, but, because sewer ventilation still offers many difficulties, it would surely be a mistake to interfere with the perfection that has been attained in our domestic sanitation by mixing it up with defects in the public sewers with regard to which great efforts are now being made to find a remedy. In certain states of the atmosphere, and especially when the weather is calm, it would be a most risky system that provided for foul sewers being ventilated through the house drains and soil pipes, where the gases would be absorbed by the water in the traps and discharged as foul odours in the interior of the houses themselves. Against this most serious occurrence there could not be a remedy of any kind, because the disconnection of which the trap is a necessary adjunct would be prohibited by the by-laws which it is proposed to alter in order to give effect to the new proposals.

Referring to the sewers, Sir Robert Rawlinson, who was a past-master in their construction, laid down the apparently reasonable proposition that if they were laid with an adequate fall and were efficiently flushed they would be self-cleansing, and that being so, their ventilation would be a simple operation if there were no foul gases to be dealt with. This seemed to be a simple solution of the problem by the expedient of avoiding the existence of the difficulty.

I do not know if there are any sewers that comply with the conditions he suggested and in which no nuisance has ever occurred, but it has transpired in ordinary practice that even sewers with ample falls and efficient flushing still give rise to emanations from the street gratings. It should be observed that in practice the flow varies greatly at different hours of the day and night, and that this must involve the existence of large surfaces that are so fouled as to give rise to the odours complained of. It has also been found that the movement of the air in sewers is of the most erratic kind, due to wind and other causes, and that arrangements that work admirably under certain conditions altogether fail owing to sudden changes which it is impossible to control.

It is difficult to arrive at reliable information as to the immediate effect of the existing arrangements upon the public health, because other conditions overlap so as to make it difficult to fix upon the one which is really accountable for the different death rates. There is certainly no immunity on account of a rapid fall in a particular line of sewers, because the gases may find their way most freely to the highest level, and the escape from the street gratings may be as bad, or even worse, at the top that at the bottom of the incline.

As matters stand at present it really amounts to this, that a sewer open from end to end, or, in other words, a well-constructed ditch, is just as much or as little likely to be a danger to health as a sewer with its foul gases escaping in a more concentrated form at any particular point. In this connection it may be well to refer to the experience of Bristol, where no system of ventilation has yet been found which could be adopted in any one district of the city without being detrimental to others, and, this being so, they have not provided sewer ventilation of any kind. All the same, the houses have been provided with disconnecting-traps, and there is no evidence to be found in the death rates arising from diseases in any way attributable to sewer gas, that can be regarded as unfavourable to the existing arrangements when compared with the death rate of other towns where the sewers are ventilated throughout. In any case it seems a poor remedy for any evils that may exist to ventilate the gases from the sewers on or about the level of the windows where the great majority of the occupants are in the habit of sleeping. My apology for having said so much upon this aspect of domestic sanitation must be that it is a matter seriously affecting the interests of architect's clients, and that the revolutionary proposals I have referred to ought to have their very serious consideration.

I do not know that with the short time at my disposal I ought to take up more of your time in dealing with the subject of domestic drainage, as there is little in dispute beyond what I have already dealt with, and until these new suggestions were made I think we were justified in considering that we in this country had not only been the pioneers of sanitation, but had reached to something very near perfection in its application.

Before going on to deal with the subject of sewage disposal there is one point on which I should make some remarks, as it must often prove to be a stumbling-block in the experience not only of the young architect, but of every member of the profession who has to deal with domestic sanitation. I refer to the question that often arises as to the amount of defect in an existing drain which justifies a recommendation for its complete renewal. As you all know, the method that has been adopted for many years and which has superseded all other

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devices is the water test. In the case of stoneware pipes this is a severe test, and it is doubtful if it can always be regarded as a fair one. With so many joints made in a way that is never dreamt of as a practical means of bearing water pressure in other cases, such as the conveyance of a water supply, it seems strange that it should be justified in a conduit that is condemned if it is not water-tight when it happens to be used as a drain. Recent opinion as to the relation between bad

TABLE SHOWING SUCCESSIVE STAGES OF MINERALISATION BY NITRIFYING ORGANISMS.
ASHSTEAD EXPERIMENTS, FEBRUARY, 1898.

Description of Samples.	A Chlorine.	B Free NH_3	C =N.	D Albuminoid NH_3	E =N.	F Oxygen consumed.	G O. consumed within 5 minutes, equivalent to Nitrous Nitrogen.	H Nitrous Nitrogen.	I =Oxygen required.	J Nitric Nitrogen.	K =Useful Oxygen N_2O_3 to N_2O_5	L Total Oxidised Nitrogen.	M Available Oxygen, useful O. Nitrate = O. consumed.	N Total Unoxidised N (Kjeldahl).	O Total Organic Nitrogen.	P Total Inorganic Nitrogen.	Q Total Nitrogen of all kinds.
Effluent from Cultivation-Tank, taken 3 and 5 p.m.	9·0	19·5	10·30	1·80	1·25	9·843	9·843	Nil	—	0·12	0·274	0·12	— 9·57	12·35	2·05	10·43	12·47
1. Effluent from First Tray	9·0	10·5	8·65	1·25	1·03	6·894	5·56	0·90	1·13	0·096	0·219	1·036	— 6·47	11·5	2·85	9·74	12·59
2. Effluent from Second Tray.	8·5	9·0	7·42	1·00	0·83	5·773	4·74	0·90	1·01	0·48	1·09	1·33	— 4·66	11·10	3·68	8·90	12·45
3. Effluent from Third Tray.	8·5	5·0	4·12	0·60	0·49	4·483	3·60	0·78	0·59	1·87	4·27	2·65	— 0·22	6·60	3·48	6·77	9·25
4. Effluent from Fourth Tray.	8·0	4·0	3·3	0·35	0·29	1·723	0·98	0·66	0·75	2·76	6·30	3·43	+ 4·58	5·15	1·35	6·72	8·07
5. Effluent from Fifth Tray.	7·75	1·5	1·24	0·15	0·13	1·23	0·73	0·48	0·55	4·68	10·70	5·16	+ 9·42	1·75	0·51	6·40	6·91
6. Effluent from Sixth Tray.	8·0	1·75	1·44	0·35	0·29	1·497	0·93	0·51	0·58	4·416	10·10	4·926	+ 8·61	2·25	0·81	6·27	7·73
7. Effluent from Seventh Tray.	7·5	0·35	0·29	0·80	0·25	0·735	0·755	Nil	—	6·6	15·08	6·6	+14·33	0·65	0·56	6·89	7·45
8. Effluent from Eighth Tray.	7·5	0·20	0·165	0·65	0·53	0·397	0·397	Nil	—	7·33	16·73	7·33	+16·34	1·03	0·965	7·45	8·35
9. Effluent from Ninth Tray.	7·5	0·25	0·206	0·60	0·49	0·559	0·559	slight trace	—	9·0	20·0	9·0	+20·1	0·60	0·394	9·21	9·99

Climax of Aerobic Nitrifying Organisms.

smells and disease has not confirmed the extreme views that prevailed a few years ago, and in any case no one suggests that a slight leakage of sewage several feet below the level of the ground even inside a house can be of serious danger to the health of the inmates. If this were so, it is obvious that, *pro rata*, a well-manured garden would be almost certain death. Whether this view is a right one or not, if an architect does not condemn a drain for the smallest leakage that is perceptible under a water test, it is fairly certain that some other expert, if he is called in, will find it incumbent on him to do so, and in that event the architect who ventured upon taking a commonsense estimate of the danger will be looked upon by his quondam client as a man who did not understand his own business. As a matter of fact, this has often occurred in practice, and new drains one after another have been frequently condemned in the same house on a change of tenancy or ownership for some trifling failure in an arrangement which in practice is never subjected to a water pressure greater than that of the passing sewage, which is practically no pressure at all. It was from the consideration of these difficulties that I made up my mind long ago to look at the question, not from the relative merits of stoneware or cast-iron, *per se*, as the best material for the construction of house-drains as if the water test had not come into vogue, but from the point of view as to which was best able to stand the test when applied. This was more than twenty-five years ago. The first large building which was redrained throughout with cast-iron pipes in London was the Foundling Hospital, where I was allowed a free hand, but it was several years before the architectural profession began to see the necessity of considering the subject mainly from the point of view of the water test. It is obvious that, in the case of cast-iron pipes and connections, the whole system should be capable of standing a high pressure of water without the slightest leakage, and that if any occurs the architect is quite justified in condemning them.

In looking back upon the early days of domestic sanitation I remember the enthusiasm with which many architects took up the crusade against the prevailing defects: the old pan-closets, the foul D traps, the unventilated soil pipes, the dip-stones, and the bell-traps, all of which have now become ancient history with which the young architect seldom has to deal with nowadays. Among these was my old friend Mr. Philip Webb, but the architect who was most distinguished for his direct and original contributions to the solution of the many unsettled practical problems of that time was the Nestor of your profession, Mr. Norman Shaw. What he made use of in his own practice was an arrangement that not only provided for a double disconnection of the soil pipe from the house drain, but did away with the use of a trap underneath the closets and sinks as well. This he accomplished by means of a hopper head into which the soil and sink pipes discharged at their upper extremities, with a corresponding disconnection on the ground level arranged with a gully-trap. In this manner he avoided the use of any closet or sink traps inside the house, to which I believe he had a strong objection, and he at the same time advocated the adoption of soil pipes of a small diameter to avoid any accumulations upon their internal surfaces. It happens that a case came to my notice only last year in which these arrangements were condemned by a local authority as being inconsistent with their by-laws, and, in consequence, they were entirely removed and ventilated soil-pipes with traps ordered to be put in their place. I mention this because it was found that the system had worked exceedingly well for, I suppose, about twenty years; and it was discovered on the removal of the soil pipes, which were only 3 inches in diameter, that their internal surfaces were as clean as the day upon which they had been fixed. It is probable that if this system had been in universal use the proposal to do away with the disconnecting-trap between the house-drain and the sewer would never have been made.

(To be concluded.)

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

THE first general meeting of the winter session was held on Thursday evening, November 4, at the Society's rooms, 10 Park Street, Leeds. Several new members and associates were admitted and the minutes of the previous meeting read and adopted.

The President, Mr. Percy Robinson, F.R.I.B.A., in the chair, announced the results of the Society's annual competitions, which, although lacking the keenness of previous years, had called forth work of a higher standard, the selection of sketches exhibited being particularly good.

The prizes were awarded as follows:—

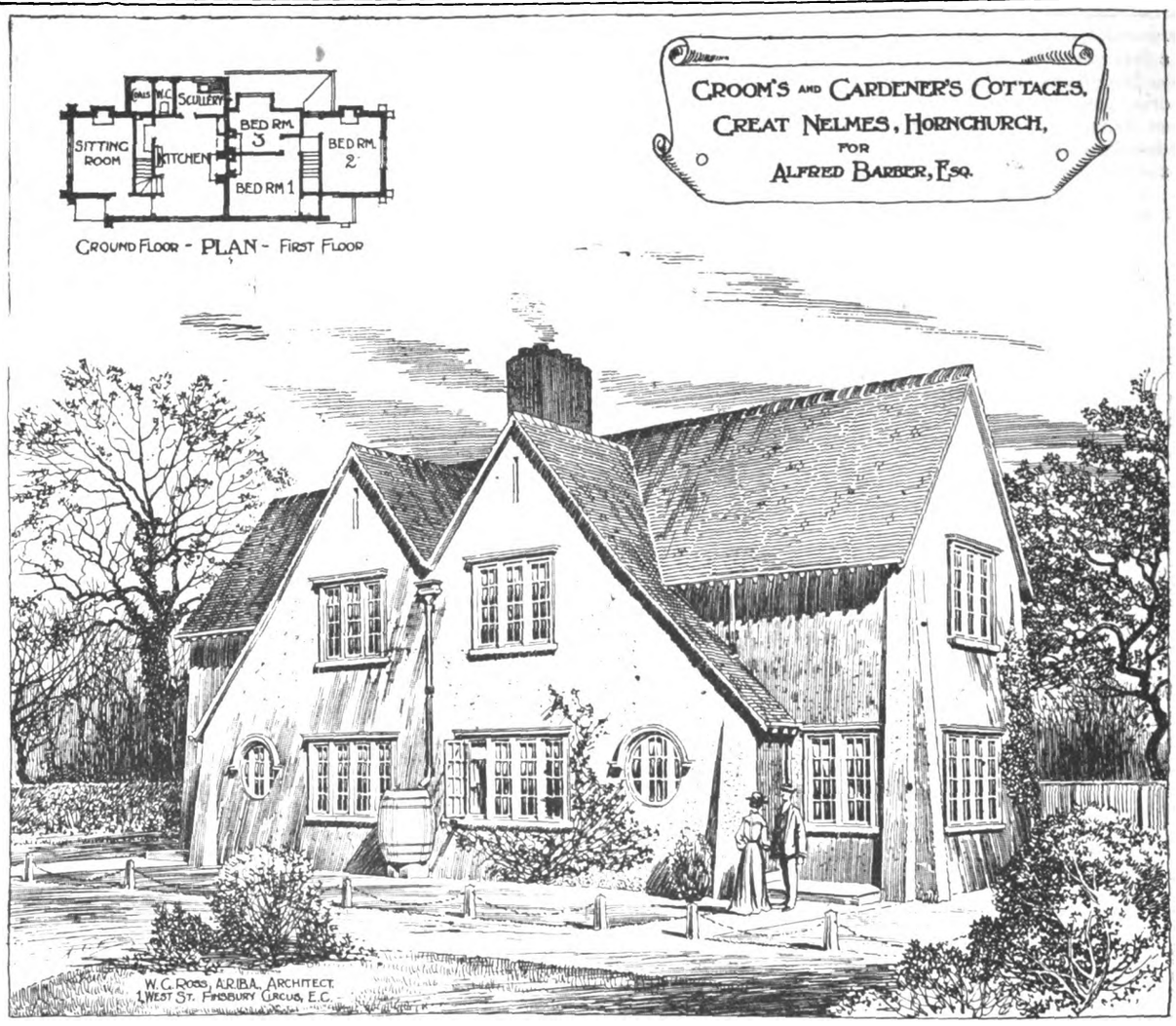
Silver medal and President's prize for measured drawings, to Mr. P. de Jong; prize for design, to Mr. P. de Jong; prize for sketching, to Mr. J. H. Farrar; prize for construction, to Mr. J. H. Farrar; prize for essay, to Mr. F. Scatchard; Halden prize for testimonies of study, to Mr. F. L. Kruckenberg.

Sketching Club Competition.—Prize for best set of studies of ancient buildings, awarded to Mr. G. H. Foggitt; prize for best set of sketches, to Mr. P. de Jong; prize for second best set of sketches (consolation prize), to Mr. C. T. Whiteley.

The remainder of the evening was occupied in an examination and criticism of the students' drawings exhibited by the members present.

The annual smoking concert and distribution of prizes was held at the Queen's Hotel, Leeds, on Thursday evening, November 11.

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COTTAGES AT HORNCHURCH.

THIS pair of cottages has been built in the grounds of the old mansion of Great Nelmes for the head-gardener and groom. The plans show the accommodation. The walls externally are rendered and floated in cement and sand, stippled and finished with distemper of a rich cream colour. The roofs are covered with old tiles from part of the mansion which has been demolished. The woodwork is painted apple-green and the ironwork dead black. The windows are wooden casements glazed with leaded lights. The cost was 475*l.* the pair. Mr. WALTER GRAY ROSS, A.R.I.B.A., of 1 West Street, Finsbury Circus, E.C., is the architect.

TESTS OF CAST IRON.*

(Concluded from last week.)

Casting Temperature.

THERE has been a good deal of discussion on the temperature at which cast iron should be poured into the mould, a medium casting temperature being considered by some to give the best results. To prove this, 10 cwts. of iron was taken from the cupola and poured into five sets of moulds. The first mould was poured at 3.40 P.M., well within two minutes of being tapped from the cupola, the second at 3.45 P.M., the third at 3.50 P.M., the fourth at 3.55 P.M., and the fifth at 4 P.M., showing a five minutes' interval between each mould. The tests shown in Table VI. clearly indicate that the mould poured first gave the best results.

Moment of Resistance Test.

It will be noticed that the transverse tests are all worked out to the moment of resistance in order to see what the result of a given test would be on the exact section of the transverse bar. In Table II. it will be seen that each bar is slightly over the 2 inch by 1 inch dimension, and the area therefore of each test-bar varies, as do also the tests, but when worked out to the moment of resistance based upon Unwin's formula :—

W = Breaking weight in tons,
L = Length of the bar between supports in inches,
b = Breadth of bar in inches,
d^2 = Depth of bar squared in inches,

$$M = \text{Bending moment} = \frac{WL}{4},$$

$$Z = \text{Modulus of section} = \frac{bd^2}{6},$$

$$f \times \frac{b.d^2}{6} = \text{Moment of resistance of bar to breaking},$$

$$f \times \frac{b.d^2}{6} = \frac{W.L}{4}.$$

Then

$$f = \frac{W.L.6}{4bd^2} = \frac{1.5WL}{bd^2}.$$

The tests show that whilst the transverse bars themselves may slightly vary, when worked out to this test based on the exact area, there is very little variation with the increasing silicon in one case, and a fall in the strength in the other. On the other hand, in the case of the bars tested as cast and as machined, whilst the machined bars may show if anything a less favourable result, if the breaking weight of the bar is based upon the exact area and worked out to the moment of resistance, it gives upwards of 10 per cent. better breaking load and 40 per cent. better deflection.

Transverse test-bars in Britain are of two sections, 2 inches by 1 inch and 1 inch by 1 inch, and the supports vary from 12 inches to 36 inches, and whilst it is not difficult to obtain an approximate comparison between these bars, it is very difficult to do so between our transverse bars and those of other countries. This difficulty could, however, easily be overcome by adopting such a test as moment of resistance, which is based upon the section of the test-bar and length of bar between supports, thus reducing the tests of all sizes of transverse test-bars to one common comparative result.

* A paper by Mr. E. Adamson (Sheffield) read at the meeting of the Iron and Steel Institute.

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Tensile Mark.	Transverse Mark.	One Ladle of Iron cast at different Temperatures.							Time of Casting.	Tensiles.		Transverse.		Deflection.		Moment of Resistance.	
		T. C.	G. C.	C. C.	Si.	S.	P.	Mn.		Tons.	Mean Tons.	Cwts.	Mean Cwts.	Inches.	Mean Inches.	Tons.	Mean Tons.
		Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	P.M.								
50		3·76	3·10	0·66	1·30	0·114	1·14	0·54	3·40	16·19	...	...	...	...	...	...	...*
51		...	...	...	...	...	...	...	...	16·13	...	...	...	...	...	...	...*
52		...	...	...	...	...	..	...	...	16·4	...	..	...	...	...	...	...*
53		...	...	...	...	...	...	...	...	16·32	16·21	...	...	..	...	...	...*
	A	...	..	0·66	...	...	...	.	...	...	...	32	...	0·375	...	20·3	...*
	A	...	...	...	...	...	...	...	...	...	...	33	...	0·3125	...	20·3	...*
	A	...	...	...	...	...	...	...	...	...	...	33	32·66	0·344	0·343	20·6	20·4*
54		...	...	0·66	...	...	...	...	3·45	14·60	...	...	...	...	..	...	...†
55		...	...	...	...	...	...	...	...	15·17	...	...	...	...	..	...	...†
56		...	...	...	...	...	...	...	...	14·08	...	...	...	...	...	...	...†
57		...	...	...	...	...	...	...	...	15·30	14·79	...	...	...	...	...	..†
	B	...	...	0·66	...	...	...	...	...	...	...	32	.	0·344	..	19·6	...†
	B	...	...	...	...	...	...	...	..	...	...	32	..	0·344	...	20·5	...†
	B	...	...	...	..	...	...	...	...	...	..	29	31·00	0·352	0·347	18·47	19·52†
58		...	...	0·68	...	...	...	...	3·50	Not sound.		...	...	...	...	...	...
59		...	...	...	...	...	...	...	..			...	...	...	...	...	...‡
60		...	...	...	...	...	...	...	...			...	...	...	...	...	...
61		...	...	...	...	...	...	...	...			...	...	...	...	...	...
	C	...	...	0·65	...	...	...	...	...	...	...	26	...	0·281	...	16·7	...‡
	C	...	...	...	...	...	...	...	...	...	...	27	...	0·273	...	17·2	...‡
	C	...	...	...	..	...	...	...	...	...	...	31	28·00	0·320	0·291	19·1	17·7‡
62		...	...	0·64	...	...	...	...	3·55			...	...	...	...	...	...
63		...	...	...	...	...	...	...	...			...	...	...	...	...	...§
64		...	...	...	...	...	...	...	...			...	...	...	...	...	...
65		...	...	...	...	...	...	...	...			...	...	...	...	...	...
	D	...	...	...	...	...	..	...	...	...	...	30	...	0·305	...	18·3	...§
	D	...	...	...	...	...	...	...	...	...	..	28	...	0·281	...	17·7	...§
	D	...	...	...	...	...	...	..	...	...	...	28	28·66	0·297	0·294	17·7	17·9§
66		...	...	0·65	...	...	...	...	4·00			...	...	...	...	...	...
67		...	...	...	...	...	...	...	...			...	...	..	...	...	...§
68		...	...	...	...	...	...	...	..			...	..	..	...	...	...
69		...	...	...	...	...	...	...	...			...	...	..	...	...	...
	E	...	...	0·66	...	...	...	...	...	...	..	25	...	0·285	...	15·2	...§
	E	...	...	...	...	...	...	...	...	...	...	24	...	0·254	...	15·3	...
	E	...	...	...	...	...	...	...	...	...	...	22	23·66	0·234	0·258	14·2	14·9§

* Very hot. † Fairly hot. ‡ Thick § Very thick.

Conclusions.

1. The best tensile and transverse tests are obtained from bars which have been machined.

2. Transverse test-bars cast on edge and tested with the "fin" in compression give the best results in testing.

3. The transverse test is not so reliable or helpful as that of the moment of resistance.

4. The use of high-grade ferro-silicon in the foundry is of no commercial value.

5. Cast iron gives the best results when poured as hot as possible.

The author wishes to thank Messrs. William Gray & Co., of West Hartlepool, for placing their foundry at his disposal for these tests; and at the same time Mr. John B. Williams, their assistant manager, for the interest taken in the experiments; as well as his late colleague, Mr. George H. Hewson, for assistance in the analyses.

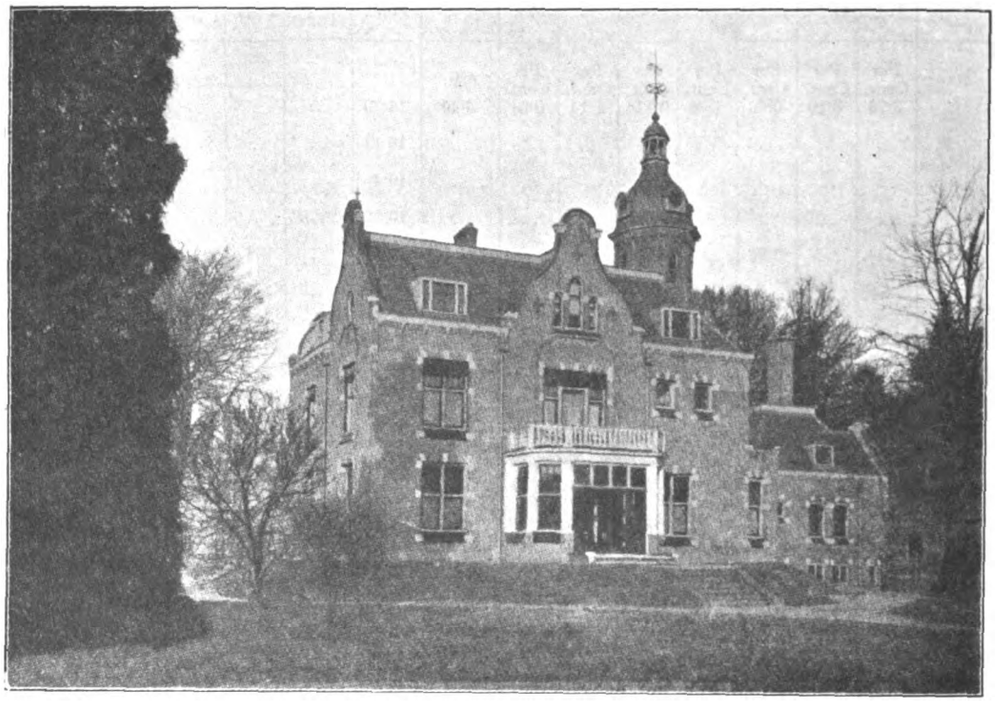
THE SURVEYORS' INSTITUTION.

THE ordinary general meeting of the Surveyors' Institution was held in London on Monday last, when the President (Mr. Alexander R. Stenning) made an interesting contribution to the discussions on the land problem in the course of his presidential address. The question of land, he said, was a subject of interest at all times. As a professional class, surveyors could not fail to have their interest in the subject increased by the legislative proposals now before the country. A wise policy of development meant prosperity to the profession, while, *ipso facto*, whatever checked that development had an equally adverse effect. To different classes land presented itself under different aspects. The farmer's chief concern was its constituent elements; to the builder it was simply so much surface to cover; while to our present rulers it was merely a taxable commodity whose chief virtue resided in its immobility. For the consideration of

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MODERN EUROPEAN ARCHITECTURE.

HOLLAND.



COUNTRY HOUSE AT VILSTEREN.—GARDEN FRONT [From *Het Huis.*

the Institute he would divide land into two classes—"food land" and "dwelling land," and in regard to the former, first discussed the question of ownership.

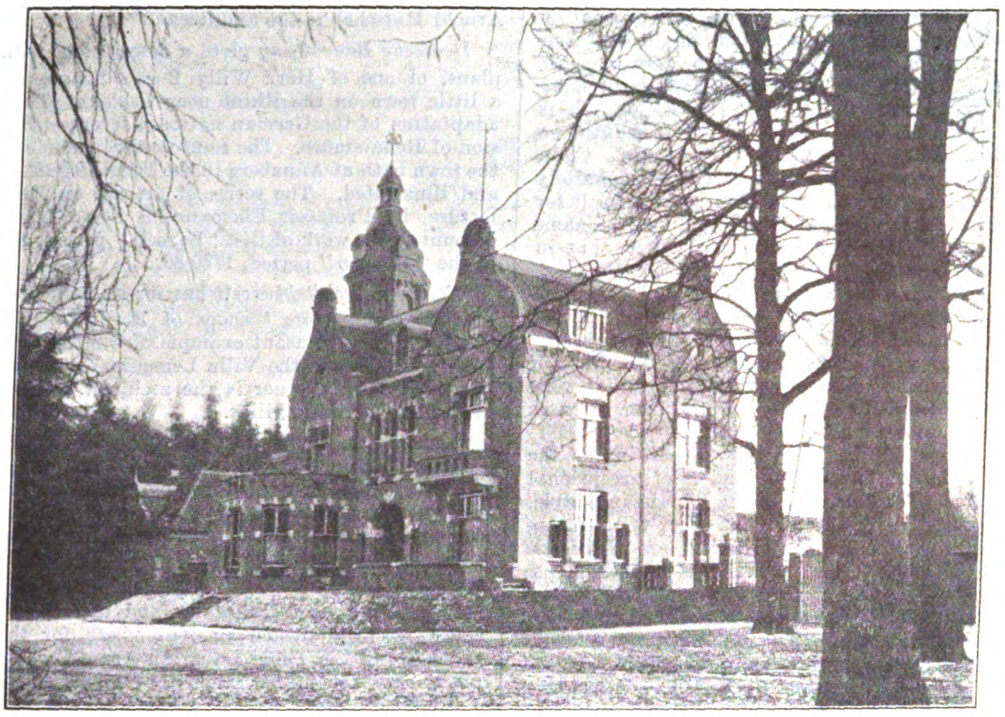
At the present time, he said, a great and growing school of would-be reformers are raising the contention that no man can have a right to hold any land as a private possession, but that, as in the old feudal days all land was deemed to belong to the Sovereign, so now all land belongs to the State, or to the sovereign people who have succeeded in gradually wresting from the Crown so large a proportion of the rights and powers it once enjoyed. Apart from any question as to the manner in which the State is to obtain possession of the land now in private hands, he for one did not believe that such State ownership would be for the good of the community. It may be admitted that a small minority of owners use their powers harshly, and that there are some incidents of private ownership which work injustice and hardship, both to individuals and to communities. But these can and ought to be alleviated by judicious legislation without subverting the social system. The experience of those countries where the primitive tribal or communal ownership of land has subsisted to the present day—Italy, Russia, India —does not encourage us to believe that any real advance in material welfare is possible under such systems at all comparable with that which we have achieved under the individualistic system with all its faults. Moreover, the present tenure of land in this country is the outcome of generations of social advance, and is buttressed by the growth of the traditions of centuries. By whatever mode possession was obtained in the distant past, and however wrongly the claims of the State were set aside by the original possessors, it cannot be denied that the present owners, in all but an infinitesimally small number of cases, paid in full for what they now enjoy. Confiscation by the State would be a crime and purchase a gigantic folly. The value of "food land," he continued, depended primarily upon what could be got out of it; and, secondly, upon what opportunities existed for marketing the produce. In a similar manner the value of the crops depended to a great extent upon what was put into the land. Here the speaker paid a tribute to English agriculture by remarking that, despite the fact that the wheat area of the country had been halved during the last thirty years, the returns showed that the farmer had adapted himself to the new conditions in such a manner as to obtain an increased yield in proportion to the area under cultivation. Further, the live stock on our farms had almost universally increased in numbers. These facts supported the suggestion that, in the absence of outside disturbing influences, the agricultural industry of Great Britain would regain its balance.

As for the value of land, no one could contend that the improvements in or upon it belonged to any but those who had made them or their successors. The present Chancellor of the Exchequer has recognised the injustice of assessing owners of land under schedule A for income-tax purposes, while commercial enterprises are assessed under schedule D. The small concession he made was due in part to actual returns from estates placed before him by the Surveyors' Institution, which showed that the annual cost of upkeep to preserve estates in a condition to maintain their present rents averaged 27½ per cent. of the gross rents. The capital expended upon food land, therefore, together with the annual cost of its maintenance, leaves little balance of value to be attributed to its original prairie or forest value. Dealing next with "dwelling land," the speaker remarked that this class, like "food land," derived its value from what could be got out of it. But in this case the crop took the form of rent, and was regulated according to the enterprise which the owner had put into his investment. The system of building leases, which plays so large a part in the development of building land in this country, has been hotly denounced by that school of reformers who seem to believe that the experience of the past is worth nothing, and that the only way to cure disease is to kill the patient. That at the end of a long period, it may be sixty or 100 years, the owner of the land should become by agreement the owner also of the building upon it, is described by them as rank robbery. But we shall all agree that unless and until the whole element of speculation is eradicated from all business, when few of us will care to indulge in it, the reversion of the building to the owner of the land is a rational and fair condition of leasehold tenure. The freeholder agrees to forego for a long period any chance of appreciation in the value of the site, and accepts a rent, well secured it is true, but small, and in no way commensurate with the value which the land will probably reach after a few years. If such additional value does accrue to the land, the profit is taken during the whole currency of the lease by the original lessee, or his successors in title, and till its termination the freeholder has no share in the profit. He is content to exchange his chances of immediate gain for the possible accrual to his children, or his estate, of a considerable future profit.

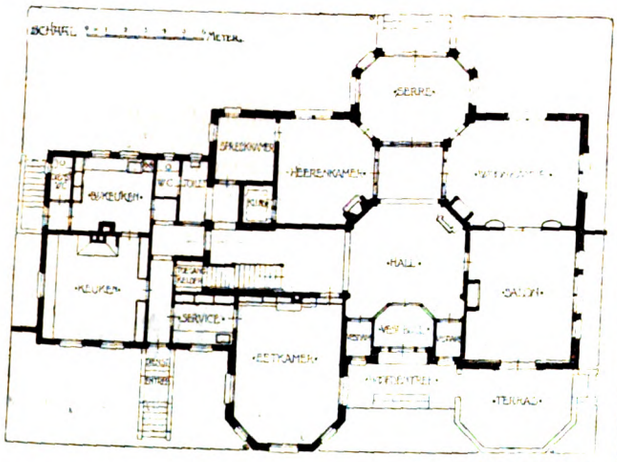
On the other hand, the leaseholder is enabled for a small fixed payment to exercise for a long period all rights of

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HOLLAND.



COUNTRY HOUSE AT VILSTEREN.—ENTRANCE FRONT. [From *Het Huis.*



[From *Het Huis.*
GROUND-FLOOR PLAN OF COUNTRY HOUSE AT VILSTEREN.

ownership over this plot of ground. Instead of sinking a large sum in the mere purchase of the site, he has full use of his capital for as long a period as he is likely to want it himself. It will not be to the advantage of the community if the owner is to be deprived of this future bonus. If the leasehold system is to continue, he will naturally demand a rent in excess of what he is now willing to take, and the tenant's position will be worsened rather than improved. After quoting figures showing that in 1901 one-twelfth of the small working population of this country was employed in the building industry, Mr. Stenning remarked that because the owners of land were fortunate enough to find their property increasing in value year by year, the Government had decided that every building owner was to have taken from him one-fifth of any profit which might accrue on the land to be developed. No allowance was to be made for any loss he might incur. Now, surely, the man who took great risks was right in expecting the chance of substantial reward, and therefore, if so large a share of his profits were to be claimed by the State, he must, to protect himself, raise his terms. The ultimate effect of the tax would thus be to make houses more costly.

The immediate result of the Budget proposals has been to strike dismay into these men, accustomed though they are to considerable risks. Unable to foresee or calculate the whole of the risks they must run, they have chosen rather to be idle, with the unhappy result that the whole building trade is paralysed, and many thousands have been thrown out of work. The land-taxers say that the tax on undeveloped land will force into the market a good deal of land which is now held up to the detriment of the community; and they maintain that building land is limited in quantity and the scarcity is artificially aggravated by those who have a monopoly of it. Now in the first place I believe this assertion to be untrue, and in the second, even if it could be substantiated, I do not think the remedy proposed is the right one. It is absurd to say that building land is limited in quantity while in every county there are thousands of owners willing, nay, even anxious to sell. What is meant by the assertion is that certain owners on the outskirts of great centres of population are not willing to sell except at higher prices than are at present offered to them, and that some people are eager to obtain particular plots, which seem to them specially eligible, at less than the present market price.

HISTORIC HOUSES IN LINCOLN'S INN FIELDS.

THE improvements committee of the London County Council reported as follows to the Council, and at last Tuesday's meeting the recommendation of the committee was adopted:—

The Council on December 22, 1908, agreed to let to Mr. R. Stafford Charles, on behalf of a syndicate, the site of Nos. 61 and 62 Lincoln's Inn Fields for ninety-nine years at a rent of 1,500*l.* a year. In connection with this letting it agreed on May 25, 1909, to grant him an option until March 25, 1911, of taking a lease for ninety-nine years of the site of Nos. 59 and 60 Lincoln's Inn Fields, at a rent of 1,550*l.* a year, provided that, if the option were exercised before December 31, 1909, the rent would be 1,500*l.* a year. Plans of the building to be erected on the first site were approved during the recent summer recess. The agreement in respect of the lease of the site has not been completed although several appointments have been made with Mr. Charles's representatives for doing so, and the option in respect of Nos. 59 and 60 has therefore not been granted.

Our attention has been called to the fact that Nos. 59 and 60 are of considerable historical and architectural interest. We have had before us reports by the clerk of the Council

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and by the architect on these points, and we have also consulted the local government, records and museums committee. In 1900 the general purposes committee, as a result of representations made by the Society for the Protection of Ancient Buildings, asked that, if consistent with the carrying out of the Holborn to Strand improvement, steps might be taken for the preservation of those houses which were of most historic interest. Of the houses affected none is of more interest than Nos. 59 and 60 Lincoln's Inn Fields. It is generally agreed that the house (which was divided into two a few years after 1750) was built by Inigo Jones. Colin Campbell, in his *Vitruvius Britannicus*, states definitely that it was designed by Inigo Jones in 1640. It was built for Robert Bertie, Earl of Lindsey, and thus obtained the name of "Lindsey House." The Council's records show that in 1700 the house was occupied by the Earl of Dorset, the poet, and thrice Regent during the absence of William III. from the country. Subsequently it was occupied by that Earl of Lindsey who was created Duke of Ancaster. It was in consequence known for a time as Ancaster House, though finally the title of Lindsey House prevailed. Another well-known person who occupied the house was the Hon. Spencer Perceval, Prime Minister from 1809 to 1812.

The house is one of the oldest now remaining on the western side of Lincoln's Inn Fields, and is of exceptional architectural merit. The façade is in the Renaissance style, of stone, since covered with stucco. The other two remaining houses in the square of great interest are Newcastle House, and Nos. 57 and 58. In the case of Newcastle House the freeholder, Sir William Farrer, has expressed his intention to preserve the existing front to Lincoln's Inn Fields, even when the rear of the site towards Kingsway is dealt with for rebuilding. In connection with the letting of Nos. 57 and 58, agreed to on January 26, 1909, it has been specially provided that the lessee shall preserve the existing front in character and design, and effect only such internal alterations as may be approved by the Council.

The local government committee are strongly of opinion, especially in view of the action which has been taken to preserve Newcastle House and Nos. 57 and 58, that Nos. 59 and 60 should not be destroyed until all other schemes for dealing with the premises have failed. They point out that it would be inconsistent with the Council's position as the statutory authority for the preservation of ancient monuments and objects of historical and architectural interest in London, to give its consent to a proposal which involves the destruction of one of the best specimens of domestic architecture with historical associations; and that were the Council to do so, it would be difficult for it in the future to approach private owners with a view to the preservation of similar buildings.

The Council of the Royal Institute of British Architects has expressed the earnest hope that it may be possible to avoid the destruction of these fine examples of historic architectural work.

We are advised that, if the present option be withdrawn, and the houses be let subject to a condition that the main internal features and the frontage be preserved, the Council will sustain comparatively little, if any, ultimate loss. Having regard to the facts set out above, we think that the frontage of the premises should be preserved, and with this object we recommend:—"That the resolution of May 25, 1909, with regard to granting to Mr. R. Stafford Charles an option of taking a lease, on certain conditions, of Nos. 59 and 60 Lincoln's Inn Fields, for ninety-nine years, be rescinded."

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* gives an ecclesiastical number in the matter of illustrations, the examples being St. John's Church, Jacksonville, Florida, by Messrs. Snelling & Potter, a somewhat unhappy and fretful piece of Perpendicular; the Church of Our Lady of Guadalupe, Audobon Park, New York, by Mr. C. P. Huntington, a dignified Classic design; and Touro Synagogue, New Orleans, by Mr. Emil Weil, which may be presumed to be based on Byzantine or Romanesque.

La Construction Moderne illustrates and describes the new cattle market and abattoirs of the city of Lyons, for which M. Tony Garnier is the architect, and which will occupy an area of 244,000 square mètres and cost at least fourteen million francs. An infants' home, founded by the benevolence of the late Madame Louise Koppe, is also described and illustrated.

Architekten und Baumeister Zeitung has another example of Viennese city architecture in the shape of a building with shops on ground floor and mezzanine with flats above. The present example is in the Tuchlauben, and Arnold Hatschek is the architect.

Deutsche Bauzeitung gives a description, with views and plans, of one of Herr Willy Bock's houses at Vallendar, a little town on the Rhine near Coblenz. This is a clever adaptation of the German national seventeenth-century version of Renaissance. The reinforced concrete construction of the town bath at Annaberg in the Erzgebirge is also described and illustrated. The series of articles on Frankish architecture, by Professor Ehemann, is now concluded with an account of the work of the "Barock" period, 1650-1720, and of the "Rokoko" period, 1720-80.

Berliner Architekturwelt has for its principal subject one of the great "store" shops of Berlin, that of Hermann Tietz. A very pleasant example of a modern country house with accessories is the Villa Lemm at Gatow, on the Havel, of which Max Werner is the architect. There are several examples of smaller villas.

Dekorative Kunst has an appreciation of the work of Johann Vincenz Cissarz, one of the best known decorative artists of West-Central Germany. Another artist of whose work a full account is given is the sculptor Georg Roemer. An article on "Small Dwelling-houses" deals with the efforts of one architect, H. E. Von Berlepsch-Valendàs, to solve the question of building a small house artistically.

Der Profanbau illustrates and describes the new residence recently erected in Nuremberg for the general in command of the Third Bavarian Army Corps at a cost of a quarter-million marks, from the designs of Herr Gottfried Kurz, of Augsburg.

Construction extols the use of clinker bricks which a Toronto architect, Mr. W. F. Sparling, of the firm of Curry & Sparling, has employed in building his own house, both for exterior and interior facing. It is at least interesting as a study in texture. In an article on "The Modern Church: What should it be?" the question is answered by illustrations of several New York churches by various architects.

The *Engineering Record* has an article on "A Concrete Church and the Methods of Waterproofing it," the building being the Church of Our Lady of Mercy, now nearing completion in the Borough of Bronx, New York City.

Correspondence

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Competition-Mongering.

SIR,—The attention that you devote to competition-mongering and its weaknesses deserves grateful recognition on the part of a long-enduring body of professional men.

I can write without animus, but with some knowledge, for in the past I competed for some of the important buildings, but so much water has run down to the sea since then that any personal bitterness is allayed.

I recall one instance of a select competition between myself and two others, where all three were shelved, and subsequently the architect, who held the balances, executed the work. But peace be to his *manes*—the relish supplied to me by the facts outweighs any disappointment.

The counsels' opinions reported in your current number are just what may be expected from members of the Bar, so penetrated by the cleverness of their minute research into phraseology as to disregard the obvious intent; it is such men as these that produce the judges, who decide by law in preference to equity.

I came to the conclusion a long while since that the best chances of winning in a competition (and the more important the latter, the more does this apply) was to depart to the utmost from the furnished conditions and stipulations.

I will not say that I have tested this method, as my arrival at the belief in its accuracy was probably coincident with my ceasing, Sir, to be

A DISAPPOINTED COMPETITOR.

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The Architect.

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FORTHCOMING EVENTS.

Saturday, November 20.

Royal Sanitary Institute: Provincial Sessional Meeting at Nottingham. Discussion on "The Improvement of City Slums by Housing Reform and Otherwise," to be opened by Alderman T. J. Dabell.

Monday, November 22.

Surveyors' Institution: Paper on "Town Planning," by Mr. W. R. Davidge, district surveyor.

Tuesday, November 23.

Institution of Civil Engineers: Continuation of discussion on three papers read at the meeting on the 9th inst.

Wednesday, November 24.

Architectural Association: Conversazione at 18 Tufton Street.

Manchester Society of Architects: Paper on "Ancient Lights," by Mr. P. M. Oliver, B.A.

Thursday, November 25.

Leeds and Yorkshire Architectural Society: Paper on "An Unknown Italian City," by Mr. Martin Shaw Briggs, A.R.I.B.A.

Concrete Institution: Paper on "Some Points Relating to Reinforced Concrete as Applied in the United States," by Mr. R. L. Humphrey, of Philadelphia, U.S.A.

THE GROWTH OF THE ENGLISH HOUSE.

HAVING in his great work on the Earlier Renaissance period of English domestic architecture given us a complete view, Mr. GOTCH has now presented us with a smaller handbook * which, though in a measure useful to the professional student, is rather better suited to the intelligent amateur of architecture, interested to know something of the houses of our ancestors, the part they play in reflecting the history and manners of their time, and the development by which they have reached the point at which the author stops, the end of the eighteenth century, by which time we come to many of the houses in which some of us live to-day.

Mr. GOTCH starts with the Norman castle as the first seed from which sprang and grew the English house, and says, "The keep, then, is the earliest form of English house built in permanent fashion." The so-called Jew's House at Lincoln at once occurs to us as a representative of probably very many stone houses of far less importance than the keeps or castles, but nevertheless built in what was at the time intended to be a "permanent fashion." The "permanent fashion" of a building designed to be merely the residence of a peaceful subject is quite a different thing from that of a castle, the fortress of a military chieftain.

It is quite wonderful when we consider the average life of an ordinary house, that is, not a castle or a palace, that we have left to us so many examples as there are of even thirteenth century domestic buildings, and it would be still more wonderful if we had more than the merest fragments of peaceful houses of the twelfth or eleventh centuries and *a fortiori* of earlier dates. Dilapidations, fire, and, above all, improvements, are constantly reducing the number of our eighteenth and nineteenth century houses. How can we expect to find homes rather than fortresses remaining as they were eight or nine hundred years ago? Because the fortresses remain whilst the homes have vanished, we cannot admit that Mr. GOTCH is justified in asserting that the keep is the earliest form of English house, even with the qualification of "permanent fashion."

We have ample literary evidence to prove that there existed in England, prior to the Norman invasion, two distinct types of house, the hovel and the hall, the homes of the serf and the master, the latter with a large contingent of dependents who lived in the hall, as Mr. GOTCH himself points out was the custom in the manor-house of the thirteenth century. Mr. GOTCH appears to be unable to get away from the obsession of a military ancestor for the English house, for he speaks of the thirteenth century manor-house as "fortified," a quite needless qualification. The origin of the hall in which the landowner and his farming men lived is not quite easy to determine. Certainly the Vikings brought with them the practice of living in "hall," but we are inclined to believe that it was of even older date.

Mr. GOTCH dismisses in a sentence the Roman dominion of Britain, and says, "We need not trouble ourselves about Roman villas; they were exotic, and there is no reason to believe that they had any influence on English houses." Considering the influence that Roman methods of building had upon English architecture, it is difficult to believe that the plans of houses erected in Roman times had not "any influence on English houses." Mr. GOTCH must have forgotten the "farmhouse" type of Romano-British house. This clearly shows a plan suitable to the "hall" method of living. So that, in our view, it is certain that the "hall" type of house existed in England before the Norman invasion, and highly probable that it was in vogue in the Romano-British period.

The keep essentially differs from the manor-house, as Mr. GOTCH points out, in that in the former the hall was accompanied by several rooms of equal size, whereas in the latter "it was not so much the heart of the house as the house itself." We therefore prefer to regard the Norman keep as an "exotic" and the manor-house as a descendant of a far older hall type of dwelling.

We think it must be his reliance upon the false premises of fortified keeps that has led Mr. GOTCH to ignore a very characteristic class of mediæval house, the grange, and to regard the moat as purely a defensive device. The plan of a grange so closely follows that of a manor-house in its adherence to the hall type that it would be difficult for anyone to suppose that both were not derived from a common ancestor; but even Mr. GOTCH does not venture to suggest that the grange was a derivative from the keep. With regard to the moat, we do not suppose Mr. GOTCH is prepared to maintain that this adjunct to so many houses in East Anglia, for example, was not intended rather as a store of food and water than as a means of defence against hostile intruders.

The town house of the Middle Ages is also strangely neglected in the author's historical survey. Is it because this cannot possibly be assigned the parentage of the keep, or because Mr. GOTCH will not admit the possibility of growth and development of this class of dwelling except for occasional illustration of façade design? A very interesting chapter might have been written on the growth of the cottage from the hovel, but cottages are not descended from keeps.

* *The Growth of the English House.* A Short History of its Architectural Development from 1100 to 1800. By J. Alfred Gotch, F.S.A., F.R.I.B.A. (London: B. T. Batsford. 7s. 6d. net.)

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If one could but clear the book of the idea that the Englishman's house is literally a castle, it would be easy to follow Mr. GOTCH in his history and enjoy the lucid and yet not abstruse way in which he treats of the growth of the manor-house in mediæval times, its development in Elizabethan and Jacobean times, and its final supersession by the amateur and *dilettanti* of the eighteenth century.

Mr. GOTCH's history is, we think, not quite faultless, however, when he dogmatically asserts that the first appearance of the Renaissance manner in England was in the tomb of HENRY VII., "erected by the order of HENRY VIII. in the year 1516. Any work with Italian or Italianised detail may safely be dated subsequent to that year." The author refers to Layer Marney, and we believe that there is documentary evidence that the Renaissance work there was ten or twelve years earlier than HENRY VII.'s tomb.

We like the way in which the author treats first of the planning and general character of the house of each period, and then deals with the detail of features.

In a book intended for the amateur rather than for the professional, the author has done well to point out how much is due to the influence of local material in determining the character of the exterior of old houses, and how especially suited to the environment is the particular treatment adopted, a point too often forgotten in these days, when railway-carriage has abolished distance, and one can if one will commit the solecism of a red-brick house on a Westmoreland hillside.

We must regard Mr. GOTCH's latest book as an interesting introduction to the subject of English domestic architecture, and hence regret what we consider the false basis from which the growth of the English house is presumed to start, in view of the very admirable treatment of the subject when once the growth is fairly started and the seedling has passed through the sapling stage to the time of fruition.

NOTES AND COMMENTS.

THE report has been published of the Commissioners to the Board of Trade on the unfortunate explosion, which occurred last April, of the heating apparatus at the Thomas Barton Holmes Council School (Infants' Department), South Parade, Hull, resulting in the death of one child and the scalding of six others, as well as their teacher, the latter so severely that she was unable to attend the formal investigation held four months after the accident.

IT is satisfactory to know that the Commissioners are able to state that no one was to blame for the occurrence, that the apparatus was properly installed, regularly inspected and tested, and worked under safe conditions as far as could be reasonably expected. On the other hand, it is very disquieting to be told that such an accident, attended with fatal consequences, has occurred, and may therefore be presumed to be liable to occur in other cases, without any satisfactory reason being discoverable, and therefore in spite of the utmost care and precaution.

THE apparatus in question was of the small tube type, commonly known as the PERKINS High-pressure System; that is, pipes $\frac{7}{8}$-inch internal and $1\frac{1}{8}$-inch external diameters of wrought iron and butt welded were formed into a closed system, part coiled round the furnace, and the remainder serving as circulating pipes with an expansion-tube 6 feet 6 inches long and $3\frac{1}{2}$ inches external diameter, the length of the piping being 840 feet. The apparatus was tested by hydraulic pressure to one ton per square inch on October 30, 1908, and burst on April 5, 1909, at which date it was twenty-two years and four months old. As many of our readers know, it is the usual practice to test these high-pressure systems to about 2,000 lbs., or, as in the present instance, to one ton the square inch, and this had been done repeatedly during the life of the apparatus.

IN the course of the inquiry this apparatus was tested to see what pressure could be obtained from the boiler, and it was found that 1,800 lbs. could be obtained by special endeavour, sweeping flues, and skilful firing, conditions which did not exist when the explosion took place. The Commissioners therefore considered that at that time the boiler could not have been worked to its full pressure, and that the figure of 1,800 lbs. to the square inch was not nearly reached.

As to the possible causes of the explosion, the Commissioners considered the suggestions of water hammer and fatigue of the metal. The former they dismissed as improbable, the latter, they considered, might be slight, but not sufficient to account for the bursting of the pipe, in view of the fact that it had been tested in the previous October.

WE do not find in the report of the Commissioners any reference to a question that occurs to us to be of primary importance, the ultimate strength of the pipes of which the apparatus was constructed. In the tests made periodically one ton to the square inch did not burst the pipes. What pressure applied to a new pipe would burst it? Unless there is a large margin of excess beyond the ton to the square inch, we are inclined to think that the repeated application of the test pressure was a factor in the disaster. But in view of the fact elucidated, though unexpected, that it is possible to develope a pressure in these systems of 1,800 lbs. or more, it cannot be said that the test pressure of one ton is excessive.

THE report and the circumstances which it discloses form a most severe condemnation of the high-pressure, small tube system of hot-water heating. A system of which no amount of care in fitting, maintaining and working can ensure the freedom from fatal accident is not one that any architect can feel justified in recommending for adoption in any building with which he is concerned.

TECHNICAL institutes are not at the present time exercising that beneficial effect upon the youth of the country who ought to become the skilled workmen of the future, or to have become the skilled workmen of to-day, that the money lavished upon their foundation and equipment have led us to expect. Hence we have the various propositions of the new Lord Mayor of London and the London County Council. When the Lord Mayor advocates a return to the old-time system of apprenticeship, he implies that the technical institutes, which were supposed to supply the training that the decline of apprenticeship rendered non-existent, are ineffective.

THE London County Council looks at the question from a different standpoint. Its position, in plain language, is,—the technical institutes exist, but they have not got the scholars; therefore the school-leaving age must be raised, and "half-time" classes must be compulsory. Of course, the root of the trouble is that when a boy or girl leaves school at the present statutory age, they can do work of a kind and earn money. The work teaches them nothing, and the money is very small, but they can do the job sufficiently well, if not quite as well as a man or woman. Hence the man or woman displaced by the boy or girl is unemployed. In due course the boy or girl grows older and is in turn displaced by a fresh generation, and becomes both unemployed and unemployable.

IN modern building the architect finds one of his greatest trials in the increasing number of the untrained or half-trained workmen, and if either Sir JOHN KNILL's revival of apprenticeship or the London County Council's extension of the old Lancashire system of "half-timers" succeeds in increasing the number of craftsmen in building trades who ken and can, it will be to the advantage of architecture, whether we view it as an art or as a profession.

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MR. G. T. BROWN, F.R.I.B.A., president of the Northern Architectural Association, in his address at the opening meeting of the season dealt, amongst other topics, with the growing evil practice of municipal corporations undertaking work in their own offices with their own staff which ought to be carried out by architects in independent practice. The ostensible reason of the practice is economy. It looks smart business to employ a young man just out of his articles at a salary of 350*l.* to do the architectural work of three or four schools a year when the outside architect's fees for any one of them would amount to the official's yearly salary. Equally so is it to spend 6*s.* 8*d.* on a book instead of going to a solicitor, or to buy a bottle of stuff at the chemist's for 1*s.* 1½*d.* rather than consult a qualified and experienced doctor. In each case money is saved, but value is not obtained. Even supposing the low-salaried official touches no "graft" and works a good deal harder than most officials do, it cannot be supposed that he is worth more than he gets, and in all professional matters it rarely happens that, however high his fees, the expert is not fully worth them. The money that is saved in fees is lost, over and over again, in unrecognisable directions when building is in question, and municipal authorities who work with cheap professional services damage the ratepayers' interests to an incalculable extent by not getting value for the money that is spent.

MR. TEMPLE MOORE, having made a further examination of Hexham Abbey, has said that the west wall of the north transept is in a dangerous state as well as the roof, and that the mischief is of old standing. That is the usual thing, of course: dilapidation starts, as it will do in every building; it is neglected, and therefore grows, and finally the point is reached at which immediate and costly reparation must be undertaken to prevent the whole thing falling down.

WE are glad to know that, after considerable delay and discussion, the Court of Common Council of the City of London has resolved to adopt the report of the Bridge House Estates Committee recommending that a new bridge over the Thames shall be constructed at an estimated cost of 1,646,983*l.*, and that Southwark Bridge shall be reconstructed and improved at a cost of 261,000*l.* We hope that in carrying out these recommendations the Corporation will take care to see that the new St. Paul's Bridge is worthy of the City of London, artistically as well as practically. On the Continent we see beautiful bridges at Paris, Berlin, Vienna, Ostend, and elsewhere. Let us have one in London.

THE famous Greek statue found on the property of the ALDOBRANDINI family at Porto d'Anzio more than twenty years ago has, by the beneficent operation of the Italian law against the exportation of works of art, become the property of the nation, the Italian Government having purchased the statue for 18,000*l.*

YOUNG MEN'S CHRISTIAN ASSOCIATION, PONTYPRIDD.

THIS building is now in course of erection. It has been planned to suit the particular requirements of the Association. The ground and first floor plans are illustrated. On the second and third floors, over the front portion, are the housekeeper's quarters, kitchens, boarders' sitting-room and class rooms, and boarders' bedrooms. At the back, a large concert hall and gymnasium runs up the height of the second and third floors, a special feature of the hall being the gallery, which is level and continued round the back of the stage, thus forming a running track. The building is fireproof throughout, and has a flat roof, to be used as a roof garden. The elevations are in red facing bricks of the neighbourhood and Forest of Dean stone. The general contractors are Messrs. KNOX & WELLS, of Cardiff. The design was prepared by Mr. VERNON HODGE.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening last at Conduit Street, W., Mr. Ernest George (President) in the chair.

Mr. H. T. HARE, Hon. Secretary, announced the decease of Thomas Worthington, past president of the Manchester Society of Architects. Mr. Worthington's connection with the Institute, he said, dated as far back as 1846, when he was awarded the Institute silver medal for an essay on the "History and Manufacture of Bricks." The deceased member was elected Fellow in 1863, and served as vice-president during the years 1885 to 1889. He retired from practice and was placed on the list of retired Fellows in 1907.

It was formally agreed that a letter of condolence should be sent to the relatives of the deceased.

Presentation of Mr. T. E. Collcutt's Portrait.

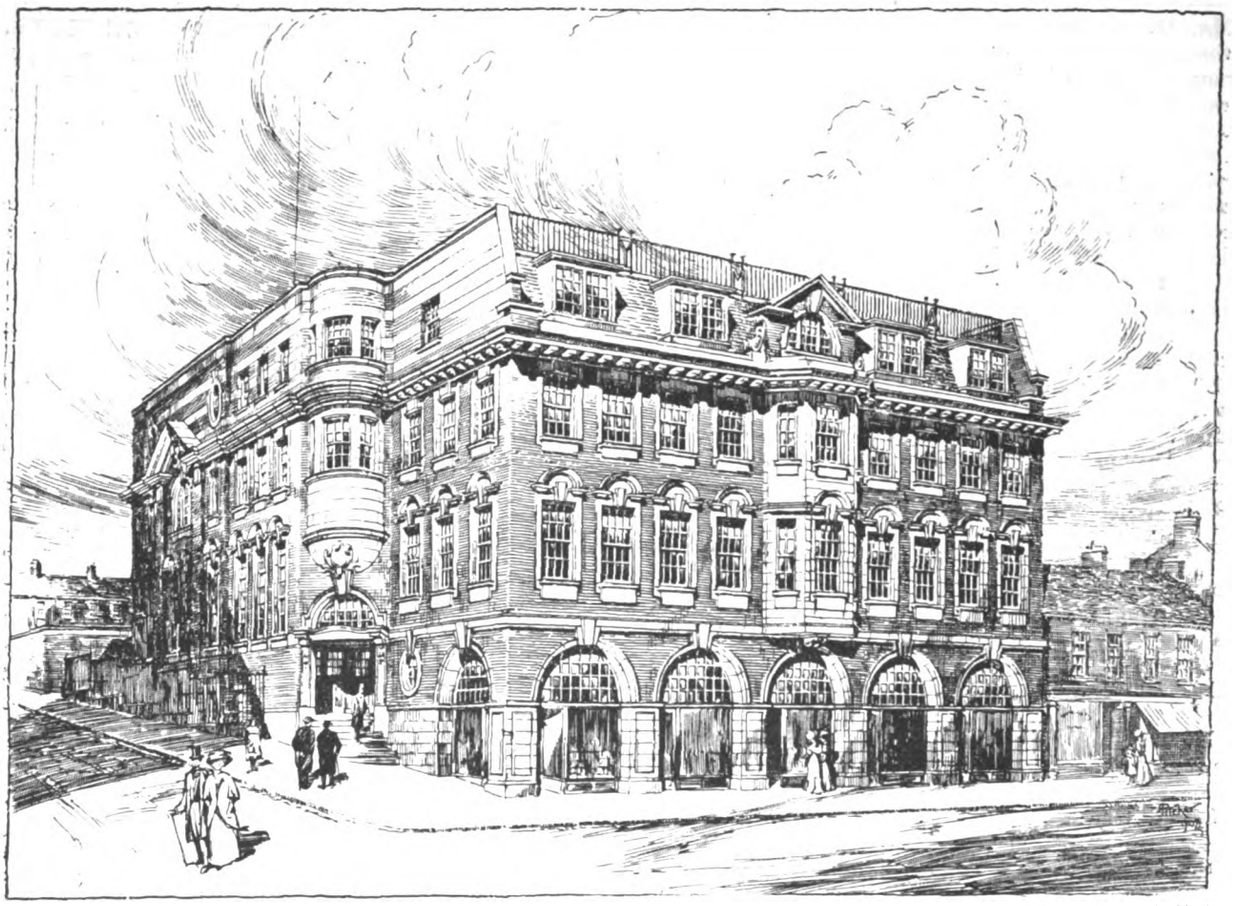
The PRESIDENT said the Institute had the pleasant function before it of receiving the last addition to its portrait gallery and a memorial of the presidency of Mr. Thomas Collcutt. The portrait was painted by Mr. Cope, A.R.A., to whom he said their thanks were due for so masterly and charming a work.

The Planning and Laying-out of Public Places.

Mr. H. INIGO TRIGGS, who had prepared a paper on this subject, was unable to be present at the meeting owing to indisposition, and the paper in his absence was read by the Secretary.

The author dealt more particularly with the architectural side of his subject, and considered the planning of public places from a modern point of view. Whilst admitting that many lessons could be learnt from classic and mediæval planning, he suggested that imitation of the same arrangement would not meet modern requirements. A demand, he said, had arisen for new types of public places, for traffic places that should effectively receive and distribute streams of vehicles with safety to pedestrians, for monumental and garden places that should show to the best advantage the buildings that surrounded them, and for places that should be useful at the same time for military parades, exhibitions, or sporting purposes, sanded or turfed, and surrounded by trees, such as the Champ de Mars. They had even to anticipate the possibilities of aviation. The author alluded to the importance of grouping the principal public buildings, and explained how in replanning Paris Baron Haussmann and his successors had fully realised that more depended upon the placing of structures than upon the structures themselves. Town-planners, too, in the United States had, within the last decade, grouped their public edifices, increasing the æsthetic effect and the simplicity of administration and maintenance. In London they had too often lost sight of the importance of enclosure to a public place, and in citing Hyde Park Corner as an example, Mr. Triggs said the scheme would have been finer had the five broad roads which entered the enclosure been arranged to converge towards a large semi-circular architectural place. The sense of enclosure, however, need not necessarily be obtained by means of architecture, and often a fine effect might be made at very small expense by the skilful planting of trees; but where planting was substituted for architecture it should be of as formal a character as possible. In order to further obtain the effect of enclosure, the streets opening into the place should be as far as possible so planned that a vista was avoided and that the eye travelled over the open space and rested on one of the boundary walls. Continuing, the author said the public places of a modern city may be considered from three wide aspects, traffic, business and ornament. In England the possibilities of treating traffic places as a means of properly intercepting and distributing traffic currents have not yet been fully realised, and it has generally been considered sufficient to place a few "islands" at those points where pedestrian traffic seemed to demand them. The second class, which we will term business places, include those various types of place whose principal object is to facilitate the transaction of business, such as the market-place and the garage place in front of railway stations or similar points. Ornamental places include all those laid out solely with the object of adding beauty to the surroundings without any regard to traffic. We do not, of course, mean to imply that a traffic place may not be also a beautiful spot. Architectural places include those which are designed to set off the surrounding architecture to its best advantage. It frequently happened that the fulfilment of two or more different purposes was attained by one public place, as in the Place de la Concorde, Paris, which was both a traffic and an ornamental place, and also in some of the Parisian *ronds-points*, which, besides receiving and distributing the traffic, were adorned with gardens, monuments, and

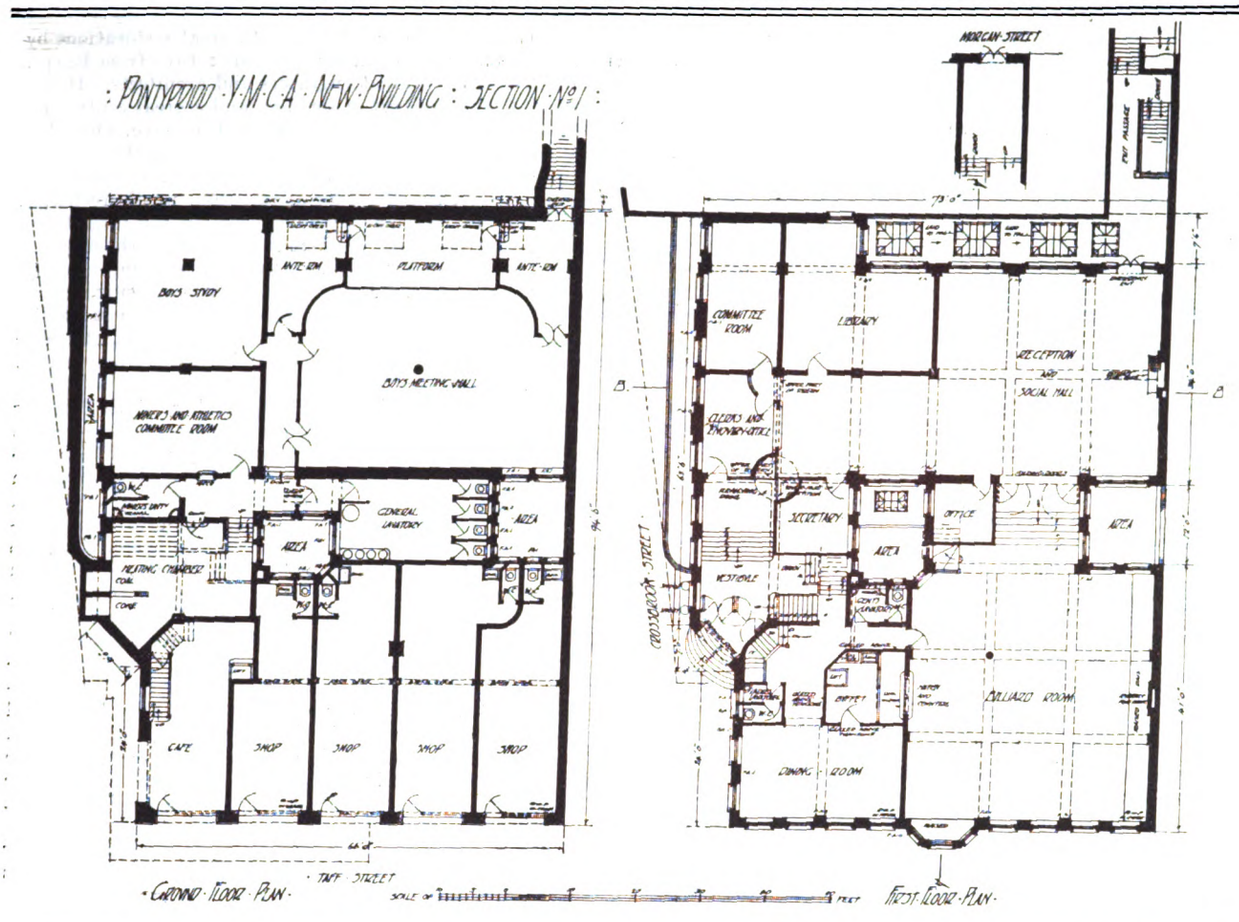
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Y.M.C.A. PREMISES, PONTYPRIDD. [*Vernon Hodge, Architect.*

fountains. The Place de l'Etoile was a combination of a traffic and an architectural place. The ideal form of town plan was the one in which the smallest number of traffic places occurred, and it certainly did not add to the ease with which traffic circulated, if it was continually being obstructed by a large number of streams converging to one point. But as they could not do away with such places and must perforce regard them as a necessary evil, it only remained to guard against the formation of useless traffic areas, and in planning such places to take the greatest care, first to estimate the volume and direction of the traffic, and then to regulate it by the disposition of the islands, whether they be the mere oval-shaped refuge or the more ambitious garden or monumental plot. For practical reasons it was desirable that the various lines of traffic should not intersect one another at one point, and where this was likely to be the case that point should be chosen for a pavement or grass plot. High monuments, or any objects likely to impede the drivers' view were to be avoided in such a position. Mr. Triggs then considered how the various places devoted to business or pleasure, in which were included market-places, exchanges, and places for public shows and festivals could be arranged to serve double purposes. In the larger towns of England and on the Continent open markets had gradually given place to closed ones, but in smaller towns and in suburban areas where a demand still existed they could still be encouraged, for besides being a valuable municipal asset if properly planned they might confer great benefits upon all classes. Plenty of trees should be planted round the sides and in the centre, and every effort made to render the place attractive as a promenade, as well as a useful centre for shopping. It might also be possible to lay out such a place so that, in addition to being a market by day, it might be used for entertainment purposes in the evening, after the manner of some of the small Spanish *alamedas*. The long stretch of the Piazza Navona in Rome, adorned with three magnificent fountains, used as a market by day, was illuminated and rendered charmingly attractive as a public dancing place by night. The author next treated of places entirely surrounded by buildings, and he offered the opinion that such squares should rely for their effect entirely upon their own architecture. It might be regular or irregular, but the enclosed space should belong definitely to one type or the other. Though the square form was pleasing, the oblong arrangement was most generally used. The garden place in a town square called for treatment in a formal manner, and the introduction of turf or trees subordinated to the architectural character of the place. Mr. Triggs lamented the indifference that was apparent in making London squares attractive, and expressed surprise that so little was done towards making them bright by the planting of trees, shrubs, and flowers. The author then went on to deal with the value of forecourt places as means of exhibiting the architecture of important public buildings to their best advantage. It was inadvisable, he said, that such buildings should be erected in a line with the frontages of the other buildings in the street, and if it was possible to set them back somewhat an air of greater importance was imparted, and at the same time they gained considerably by being seen in a more favourable perspective. France and Rome afforded many charming examples of such treatment. The last part of the paper dealt with places which were partly built upon. These frequently, said Mr. Triggs, occurred in cities where triangular and irregular sites had been created by intersecting thoroughfares, and were suitable for the erection of such buildings as churches, museums, and picture galleries, whose character demanded an open site on account of their architectural importance and of the necessity of obtaining light on all sides. Extremes of narrowness and width were to be avoided; an exaggerated width led to a feeling of emptiness which it was not easy to disguise by tree-planting and gardens. It is, of course, difficult for the designer of the place to estimate the probable height of the building to be erected, and the future might generally be left to the sensible treatment of others, if the authorities on their part would only insist on the importance of recognising the necessity of proportion between the width of the place and the height of the adjoining buildings. That class of place demanded skilful treatment where it occurred in a position terminating a vista and forming the meeting-place of several traffic arteries. In that respect most of the best examples were to be found in Paris, where the importance of obtaining a series of imposing street vistas had been better realised than in any other city. In the smaller English towns they often found the market-hall placed in the middle of an open place, as at Abingdon and Peterborough, with a very pleasing effect. In larger examples the traffic requirements demanded that the buildings should be set well back from the traffic currents, and the many instances they found of the violation of the rule resulted in great disturbance to the traffic. The Place de l'Opéra and Place de la Madeleine, Paris, and

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the Gensdarmen Markt, Berlin, were good examples of ornamental places, though varying considerably in their character.

Mr. H. V. LANCHESTER, in proposing a vote of thanks to the author of the paper, said they were indebted to Mr. Triggs for the breadth of his studies in connection with the treatment of public places. The paper referred to the axiom that more depended on the placing of the important buildings than on the structures themselves. That would be true, the speaker suggested, in the school of formal civic design, but the opposite was also true when they came to the informal method of civic design. The latter arose from the adaptation of the natural lines of traffic and the obvious utilities of the primitive city, and it seemed to him that those cities which had been apparently laid out by instinct had acquired a charm which was lacking in those planned and laid out in studied design. They saw in the one case a school that said let us have buildings absolutely adapted to their positions, however curious and irregular they may be; let us study the irregularities of the site and secure every charm available. The other school said let us study the position of our buildings, and if the positions are reasonably good they will tell of themselves. He was sorry not to have seen an illustration on the screen of Mr. Triggs's scheme for a semicircular place at Hyde Park Corner, as the author's intention was not quite clear to him. With regard to the garage place opposite railway stations, he thought in England they were more in favour of circulating the traffic. The method adopted was more or less slip-shod, and he believed a great deal might be done to make the circulation easier and more gradual. In alluding to forecourt places, Mr. Lanchester said the arrangement had no doubt grown up from the feeling in the south of Europe that there should be a gradation in the act of passing from the outside air to the interior of a building. The planning of a building and its surroundings was not a distinct thing, and a passage was adopted from the open air to the building by *loggi*. In northern climates they did not feel there was the same need for graduating the transition between the building to the open street. Architecturally they could not help feeling the value of forecourts to important buildings, for even from the earliest periods it formed part of the general plan, and in the narthex of the early churches they had a familiar example of its importance.

Mr. PAUL WATERHOUSE seconded the vote of thanks, and said he regretted that the author of the paper was not able to be with them. He did not wish to enter into a discussion of general subjects, but he would like to make a few remarks on what he might call general grounds. He felt that the whole question of planning places or *Places*, so far as it had practical bearing for architects, must be intimately wrapped up with the general principles of town planning. Those general principles might be divided into classes—the needs of small provincial cities and those of a large metropolis, and in another division the entire new planning of an old city. The real trouble of their unhappiness in regard to London was that they did not see how the remodelling of it was to come within the range of practical politics. The Traffic Commission had achieved an enormous work in bringing together data of the very foundation of the difficulties of the traffic problem, and the speaker believed that if the scheme suggested by the Commission was nurtured architecturally and brought into harmony with some of the existing buildings, great benefit to the metropolis would ensue. Another solution of the traffic problem, he believed, could be found in regulated gyration and the making of subways in crowded centres; the viaduct system too might be adopted, for there were places in London where time was lost by the congestion of vehicles, and a remedy would be attained by overhead traffic.

Mr. H. H. STATHAM said reference was made to towns formed or planned on natural lines, and he asked what were natural lines. Thoroughfares might have begun as lanes passing fields, but he did not see in considering town planning what they had to do with natural planning. The town was an artificial thing, and they had to treat it as such. There was a great deal to be said for radiating streets, but he reminded them that from the point of view of buildings such schemes left a great many awkward plots, awkward to plan, and awkward to treat architecturally.

Messrs. Francis Hooper, W. Woodward, F. W. Speaight, and Raymond Unwin also supported the vote of thanks.

THE BRITISH SCHOOL AT ROME.

THE annual meeting of the subscribers and friends of the school was held on Tuesday last, Sir W. B. Richmond, R.A., in the chair, when the ninth annual report of the managing committee and Dr. Duncan Mackenzie's report on Discoveries in Sardinia were presented and taken as read.

The committee's report states that the year 1908-9 has been marked by two features of special interest—the successful excavations in Malta carried out by the Government of Malta with the collaboration of the school, and the comple-

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tion of the catalogue of the Capitoline Museum, which the committee have pleasure in announcing will be published in due course by the Clarendon Press.

Dr. Mackenzie's report deals with the discovery of dolmen tombs and the nuraghi, which in Sardinia "are of the very greatest importance, especially from the point of view of their strategic influence. They form a regular network as far as the sea, and one can see by studying their positions of vantage that they were all directly or indirectly in signalling communication with each other."

It may perhaps be supposed that from the stress laid on the excavations in Malta and the relics of the bronze age in Sardinia that the work of the British School at Rome is mainly concerned with prehistoric archæology. Such, however, is not the case, and the committee's report deals with the work of several of the students and associates who during the past year have given their attention to Roman work of the Classic Imperial time, to Mediæval and Renaissance colour decoration, to Renaissance architecture, as well as to subjects of more purely archæological character.

A collection of drawings showing the width of scope of the work of the school was exhibited.

Possibly the most interesting feature of the meeting was the suggested formation of a Society for the Promotion of Roman Studies on the lines of, and in collaboration with, the Society for the Promotion of Hellenic Studies, the Council of which latter Society has taken the initiative in the formation of the new body.

Sir W. B. Richmond said that his only claim to speak was that he was an enthusiastic amateur and that archæology had always had a great fascination for him. The fruits of a cultivated observation could, however, never be out of place in a gathering of scholars, for book-learning without it cramped the mind. As in an engrossing lecture the introduction of graphic examples is necessary, so archæology brings to history vitality and accuracy.

Archæology is essentially a modern science. Though scarcely a century old it has converted dead into living pages of history and illuminated much that was obscure. The study of archæology is perhaps the most practical way to learn history. A hundred years ago the knowledge of Egypt was practically nil, now through the labours of archæologists it lives again. Schliemann, despite opposition, broadened our views of the Greek races and directed attention to Crete, where Arthur Evans, Mackenzie and Hogarth have since attained revolutionary results. Boni and Lanciani, following on Rossi, have traced the annals of Italian races. These and others have, in a sense, remodelled history and shown the building up of ancient civilisations. Their labours have been most serviceable to artists, whose spontaneity and technical artifices need not be hampered by being inexorably truthful when the mind can be projected into the very atmosphere of ancient life. It is possible to give such local colour to ancient themes that they now possess as much raison d'être for art as any modern subject can provide. Yet curiously it is banal to do so, as if no fine work of art could be produced except the motive be the everyday and the commonplace.

Although Italy has been thrown open to an extraordinary degree, all archæologists seem to have concentrated round the Capitol. To some extent this was inevitable. But a more or less fresh field for the operations of the British school might be found in many important centres where Italian life has been working its destinies from prehistoric periods to to-day. Italy is full of variety and possessed of abundant manifestations of individual though related art. The whole country is a mine of unexplored treasures; and to spend two or three weeks in some of the smaller and more out-of-the-way cities is only to have enough time to begin to know people who would aid in researches, and to touch only too lightly on the fringe of what might prove to be unknown treasuries. Everywhere a local archæologist is to be found, struggling sometimes to bring out a book, with small funds and a pittance to live upon, learned in his way, and ready to give up his time to an eager stranger.

There are one or two places which might be mentioned as offering reward to the well-equipped and strenuous student. All know of the treasures found at Palestrina, but how few really know the place whence they came. Summer would be the best time, when long days can be spent unravelling the countless links of a chain which bind ancient "Prenesti" to modern life. Prenesti gained its independence before Rome, and is in its way as interesting. This little city, on a spur of the Sabine Hills, is contained within the area of the Greek Temple of Fortune, whose Cyclopean walls cover a line of some three miles. It possesses historical evidence from prehistoric times, through Etruscan rule, the great Republican period and the Empire, the latter ending with great restorations by Hadrian, probably immediately after his return from Egypt.

Here foregathered great engineers and architects. It was the seat of a religious cult of fortune, and a great centre of a mysterious kind of cave worship. Around the cave, which has been at some time apparently cased with metal, there gradually arose a college of priests. The Temple grew up under Etruscan, Republic and Imperial sanction, until erected on several hewn-out terraces it became perhaps the largest and most important in all Italy. One can almost see the majestic pile, the various altitudes of terraces, the culmination of splendour which rose up at the extreme altitude, surrounding the sacred cave whose floor still displays the mosaic pavement, set there possibly by Greek and Egyptian artificers, elaborate in detail, finished as workmanship, and strangely romantic in its design.

The basilica erected over the sepulchre of the martyr Agapito is as a growth from the ancient shrine; it is encrusted with tablets; Christian and pagan signs jostle one another, giving evidence of the subtle interweaving of pagan and Christian votaries. Several fragments of Egyptian obelisks have been discovered; and in many parts of the mediæval town highly ancient pavements and walls crop up, some Cyclopean or Pelasgic, others of the Republican periods. In this small area there must be yet undiscovered history. A restoration of the temple was made by an Italian architect, and since its publication some excavations have been carried out, but there remains much to be done. Mention must be made of a group of colossal scale, carved out of the rock, unfinished, but noble in the extreme, probably by Michel Angelo when he stayed self-exiled with the Colonna family. This group has been strangely overlooked. It seems to be the work of that master in his prime, unfinished, though the greater parts of it are; the figure of the dead yet living Christ could scarcely be the work of any other hand than his.

Volterra is another town but little visited. In the summer it is one of the most delightful places in all Italy, and teems with possibilities for the student of nature, art and archæology. The distasteful invasion of philistinism has not yet reached even the outskirts of its ancient walls, or at least it had not done so eight years ago. The muniment rooms of the Palazzo Publico contain thousands of details, chronicles and literature on every conceivable subject connected with the city. There is no museum of the kind to be compared with the Etruscan Museum of Volterra, either for the quantity or the quality of the works mainly executed in alabaster, and often exhibiting a local genius for design neither Greek nor Roman in character, but obviously the apex as it were of an indigenous art, if there is such a thing. The subjects range from reliefs relating to death and the travelling soul, to episodes from the Iliad, especially of the story of Helen and Paris, some of which not being at all archaic, but highly accomplished art, are remarkable for spontaneity and freedom of design. Scattered about in various churches there are very fine pictures, besides some unfinished frescoes by Ghirlandajo, of first-rate importance as regards the fresco painter's technique.

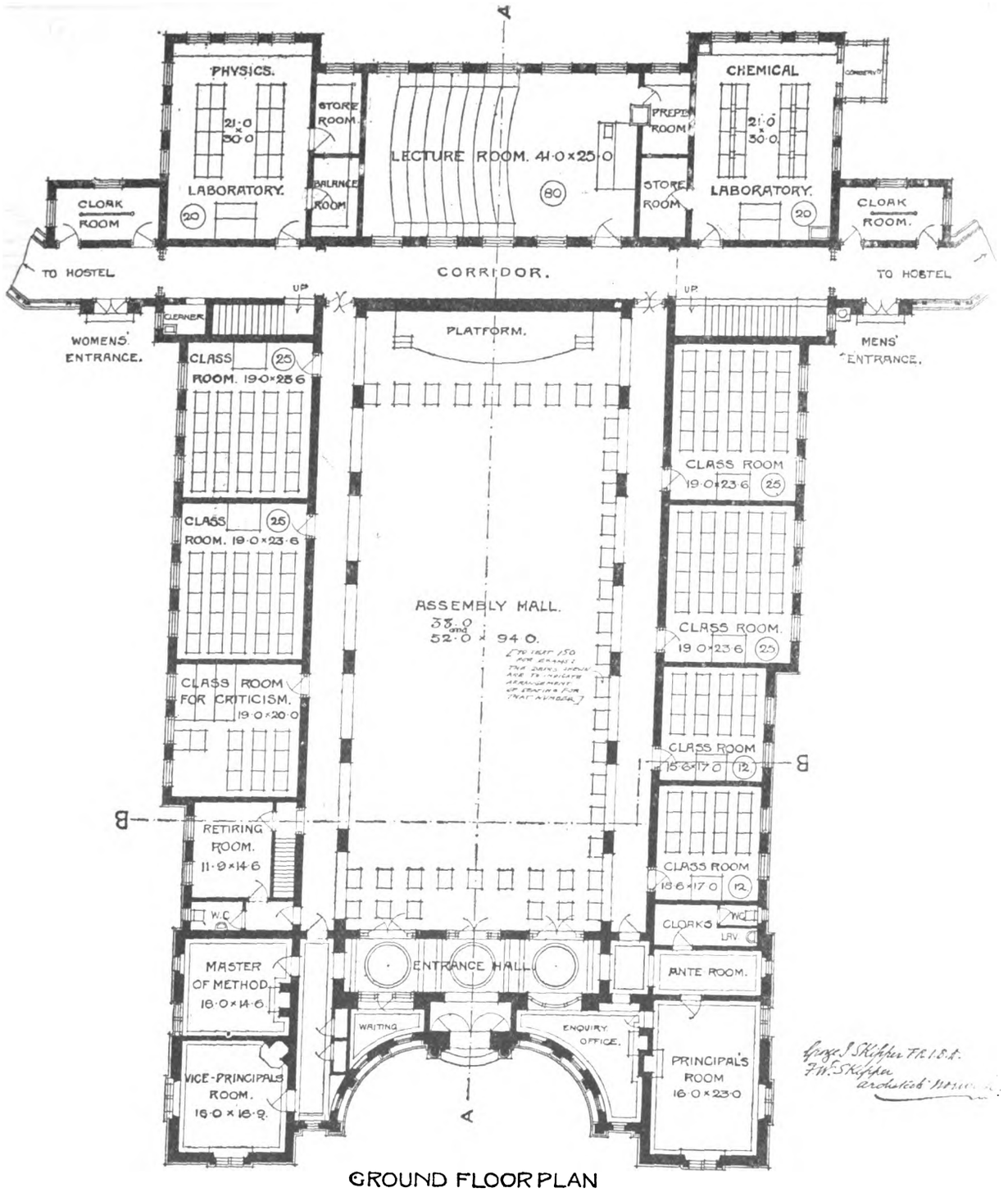
The fact is we have only been permitted a glance at the treasures contained in Italy, treasures which may still await the student in most unexpected places. If in a summer wandering one only found a single important work, or even clue to one, that would be a reward for roughing it a little in a glorious climate and among a delightful people.

Another field for a student of the British school at Rome would be the investigation into the unsolved problems of wall paintings. In the Museo Nationale at Rome there are some fragments of such inscribed with Greek names, which are of great beauty of design, execution and colour. One longs to know the methods of those ancient masters, the pigments they used, what technique was employed.

The scholars of the school need be no "dry-as-dusts" in the face of all the fresh conquests there are before them to achieve, if with energy and enterprise they manfully attack hitherto unvanquished difficulties, and lead to others as extended knowledge is gained and experience accumulates. The prompting voice of enthusiasm will call out enterprise, and solid hard work undertaken gravely and in earnest, must in time make the young English school at Rome an important factor in the history of Italian archæology.

Sir Rennell Rodd, K.C.M.G., in seconding the adoption of the annual report, said he had only just returned from Rome, and he could report that the school was getting on very well. What was most wanted was students, and these would, he trusted, be attracted to the school by the knowledge of what they could obtain from it. To be absolutely candid, it was impossible to look at the sister institution of the United States without envy. There was lots of room for more students so

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GROUND FLOOR PLAN

COMPETITION DESIGN FOR TRAINING COLLEGE, HULL.—Unit C. By MESSRS. G. J. & F. W. SKIPPER, Architects.

long as Italy presents such enormous fields that have been hardly investigated, and it was to be hoped they would go to Rome from England as they do to Athens. In archives alone the resources of Italy were practically limitless. It was true that there were not the same facilities for exploration as in Greece, but that for many reasons was impossible. The school was very vigorous and flourishing. The work of the director and the assistant-director would alone justify its existence.

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 22, MR. JOHN W. SIMPSON, F.R.I.B.A.

MR. JOHN W. SIMPSON has filled the office of vice-president of the Royal Institute of British Architects and acted as the energetic representative of the Council in the endeavour to secure for British architects the benefits of an international law of copyright. Mr. SIMPSON has recently been elected a member of the committee of the British School at Rome.

NO. 23, MR. A. N. PRENTICE, F.R.I.B.A.

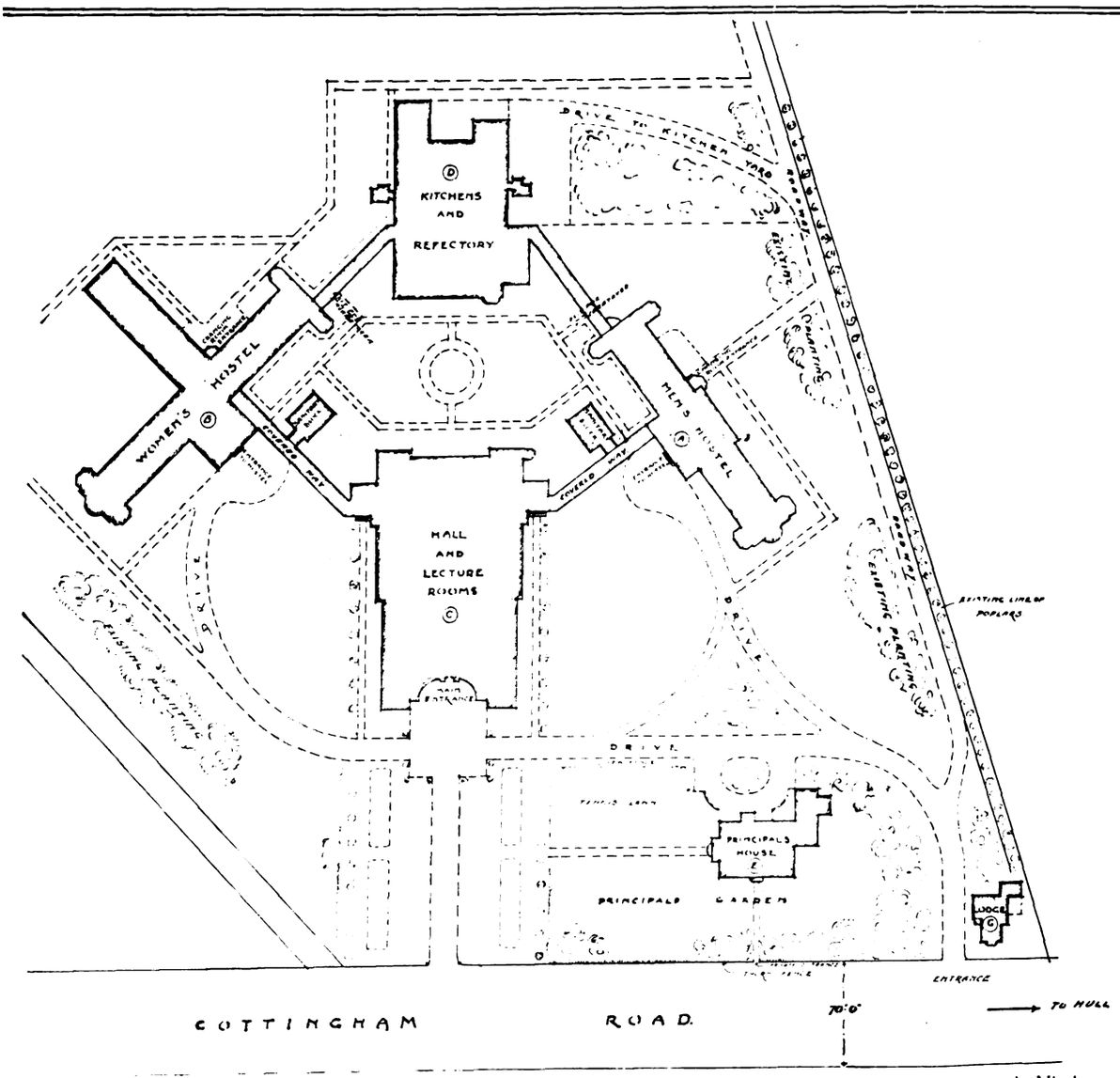
MR. PRENTICE is one of the younger generation of our prominent architects, who first made his mark as the introducer to English students of the Plateresco period of Spanish Renaissance architecture. Always an able draughtsman, Mr. PRENTICE has shown ability and originality in his designs for domestic work. His latest achievement, the fitting up of the s.s. *Orvieto*, is to be visited by the Architectural Association to-morrow.

COMPETITION DESIGN FOR TRAINING COLLEGE, HULL.

THE very carefully drawn conditions in this competition led the authors of this design to conclude that the promoters demanded a scheme embodying the greatest possible *utility*, perfection in *sanitation*, and *economy* in regard to *working expenses* more than economy in first cost. The conditions were complex: in the scheme submitted the authors venture to think that all essential points in the conditions are complied with.

Some of the advantages of the scheme are:—(*a*) The freest exposure of all parts of the building to external air

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COMPETITION DESIGN FOR TRAINING COLLEGE, HULL.—Block Plan. By Messrs. G. J. & F. W. Skipper, Architects.

and sun, (*b*) most direct means of communication between all parts of the building, (*c*) the general disposition of buildings adapts itself to the peculiar shape of site, (*d*) direct supervision—no study bedrooms on ground floor—(as being objectionable in the case of a mixed college), (*e*) isolation of sanitary blocks, (*f*) the required isolation of the sick rooms, which are cut off from the rest of the hostel, having a separate staircase of their own, and being quite near to the refectory block.

The request for special spacing of desks in study rooms and in the assembly hall necessitated much larger rooms than the superficial area laid down by the Education Department. Worked out on these lines, economy was not a ruling factor; had the authors known that economy was the object to be achieved, without interfering in the least degree with the plan of their scheme, by reducing sizes and heights to the lowest possible standard, they could have effected a saving of many thousands of pounds. The price per cube foot, being fixed at the rate of 7*d.*, necessarily worked out to great disadvantage in the case of a design developed not on the most economical principles. The total cost amounted to 54,222*l.*

The architects were Messrs. George J. Skipper, F.R.I.B.A., and F. W. Skipper, of Norwich.

Church of St. Anselm and St. Cecilia, Kingsway.

This church takes the place of that which was long known as the Sardinian Chapel, Lincoln's Inn Fields, which was taken by the London County Council in connection with the forming of the new Kingsway thoroughfare. There was a tradition that the old chapel was designed by Inigo Jones, who did so much other work in the vicinity, but having been completely wrecked during the Gordon riots, and afterwards restored at the expense of the Government in apparently as cheap a way as possible, it bore no trace of any architectural character that could be thought attributable to its reputed designer. It was, however, the oldest post-Reformation Catholic place of worship in London, and existed under the protection of the Sardinian Ambassador until such help was no longer required. The new church is designed in the Early Renaissance style (as being considered most suitable to its traditions), and consists of a nave and chancel with one wide aisle on the south side, the sacristies being beneath the chancel. A feature of the interior is the rood loft beneath the chancel arch, in connection with which are two side galleries to accommodate the organ. The church accommodates about 500 people, and together with altar and furniture and a residence for three priests has cost about 12,500*l.* Mr. Fredk. A. Walters, F.S.A., of 37 Old Queen Street, is the architect; and the contractors are Messrs. James Smith & Sons, Ltd., of South Norwood.

Detail of Competition Design for Berkshire County Council Offices, Reading.

The competition for the Berkshire County Council offices was remarkable for the many excellent details submitted with the designs, two of which we illustrate this week, those by Messrs. Wenyon & Potter and Messrs. Crouch, Butler & Savage.

Oxford College Series, Brasenose.—Chapel.—Organ Screen in Chapel.

We this week complete our series of views from Brasenose College, the descriptive account of which appeared on October 1.

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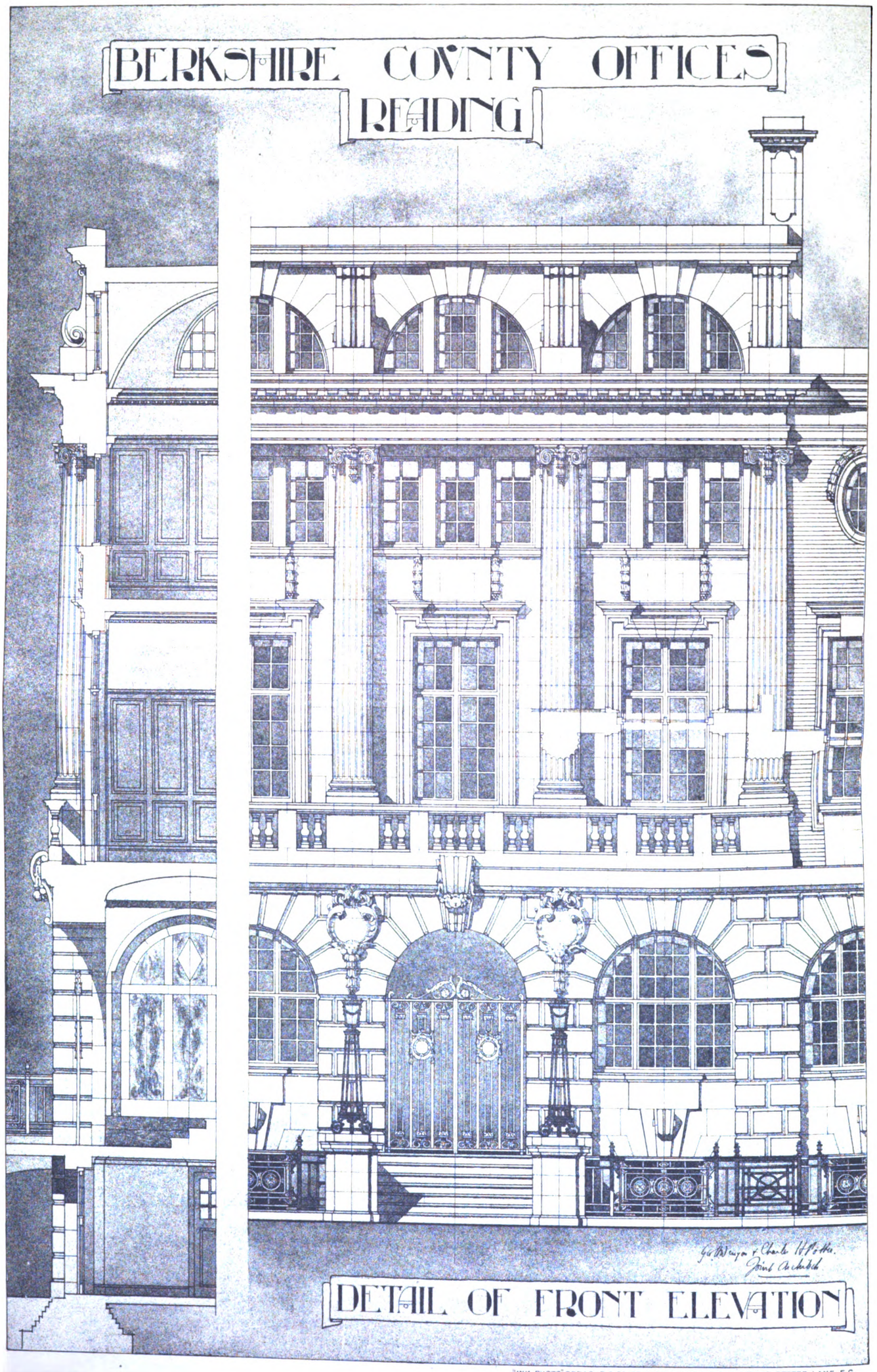
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OXFORD COLLEGE SERIES. No. 61.—BRASENOSE: CHAPEL.

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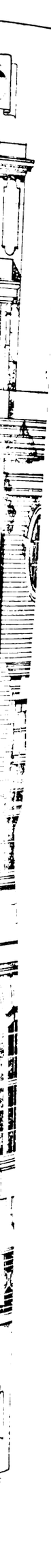


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DETAIL OF COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING,

Messrs. GEO. H. WENYON and CHAS. H. POTTER, Joint Architects.

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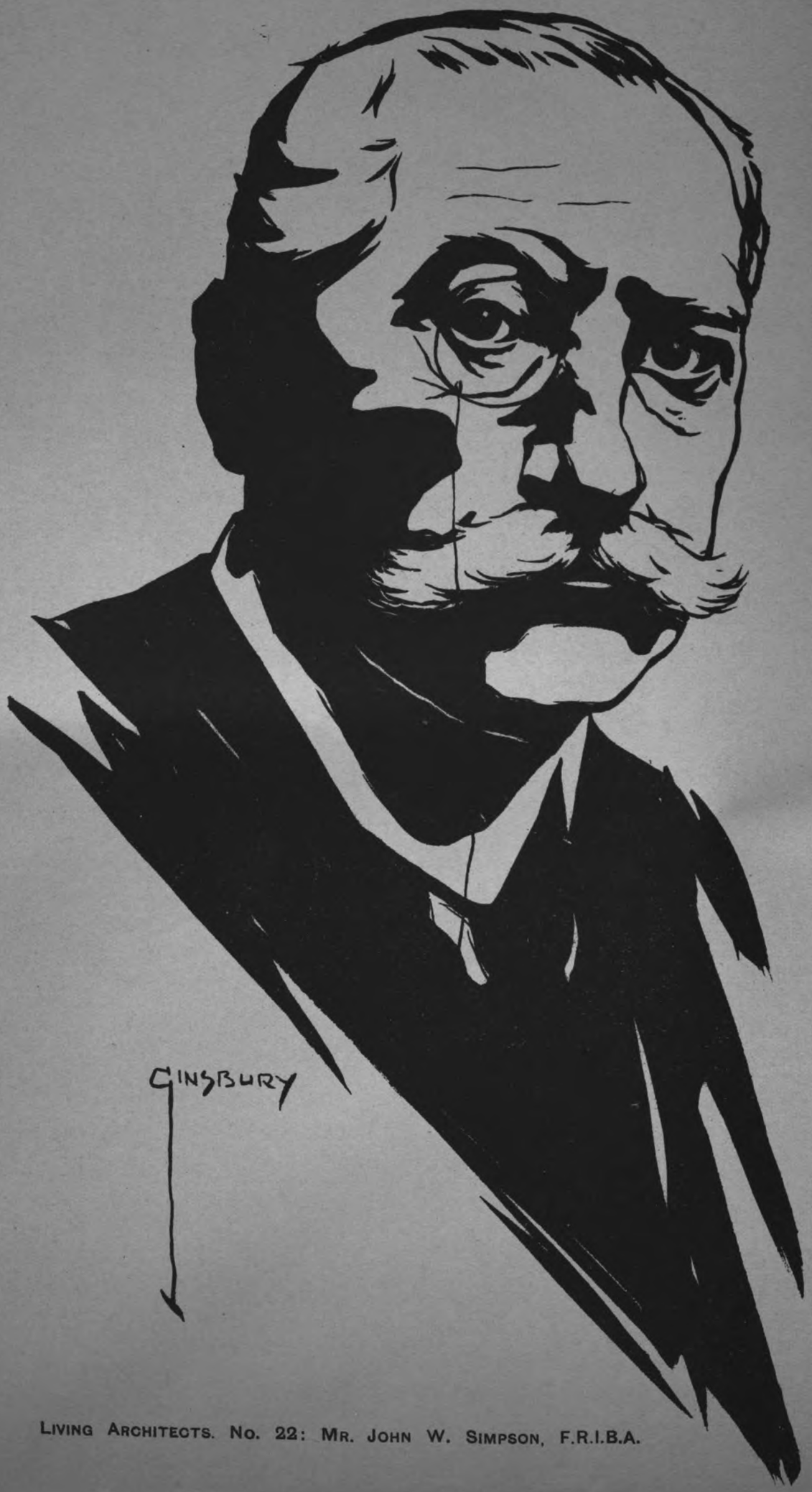
CHURCH OF S. ANSELM AND S. CECILIA, KINGSWAY.

F. A. WALTERS, A.R.I.B.A., Architect.

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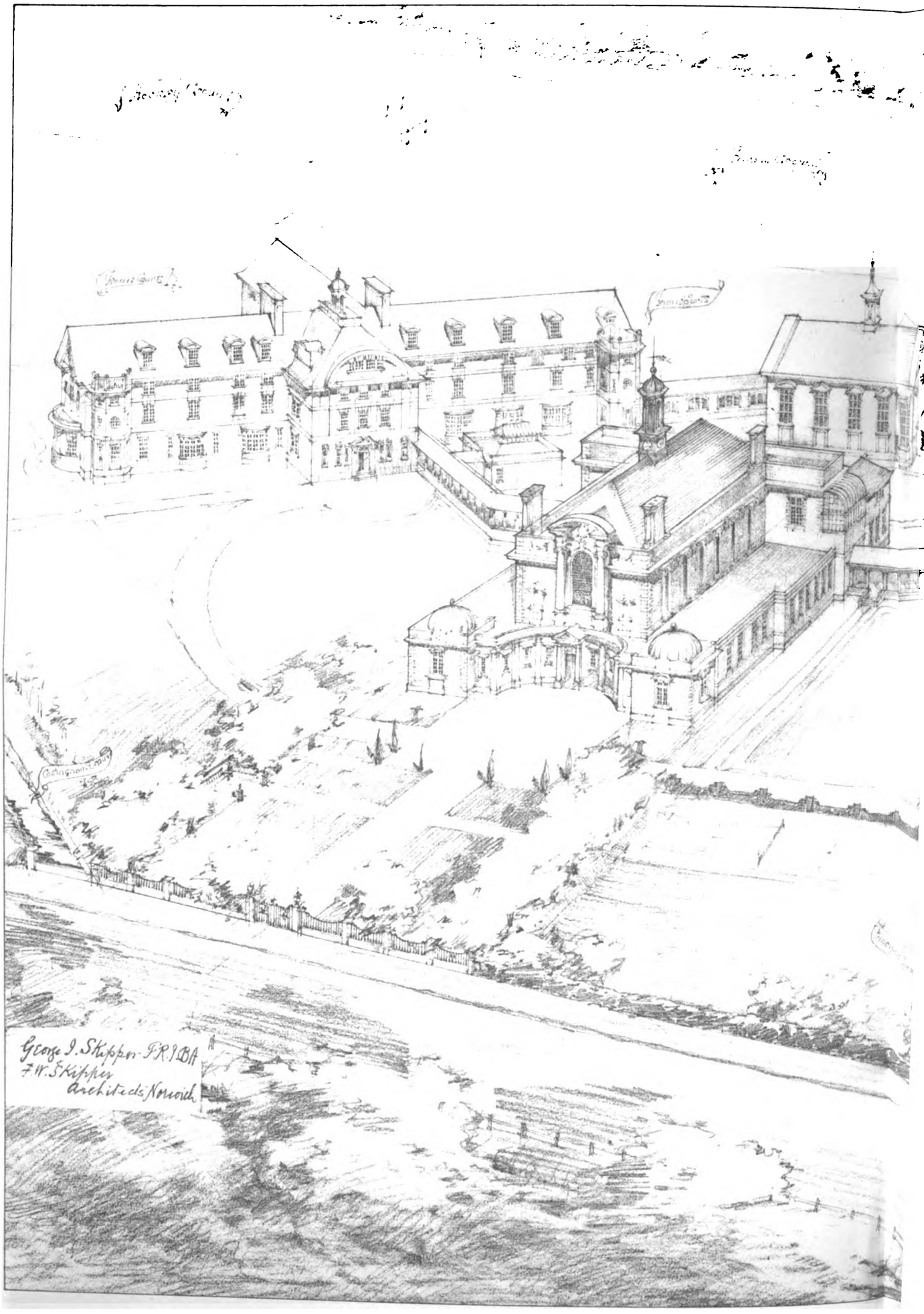


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W. SKIPPER, Architects.

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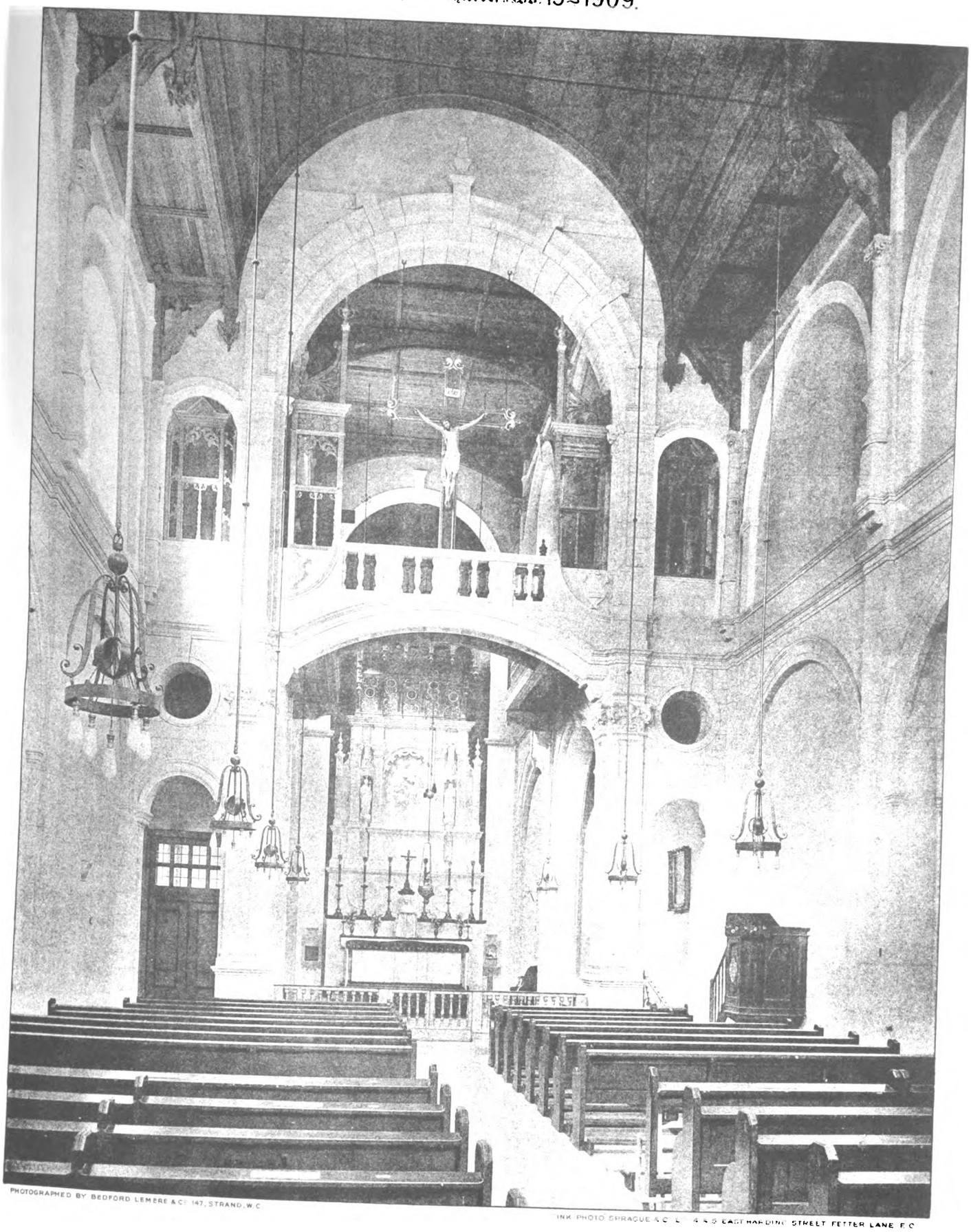
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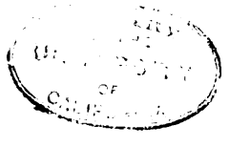


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DETAIL OF COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

Messrs. CROUCH, BUTLER & SAVAGE, Architects.

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OXFORD COLLEGE SERIES. No. 62.—BRASENOSE: ORGAN SCREEN IN CHAPEL.

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HOUSE DRAINAGE AND SEWAGE DISPOSAL.*

(Concluded from last week.)

COMING now to the subject of sewage disposal, although my remarks should be confined to that part of it which most concerns the architect, namely, the drainage of country houses, it may be well to say something about the general principles which should apply when adopting what is known as the bacterial system of sewage disposal, which was the first to apply in this country, deliberately and in a practical form. It is needless to say that as a matter of fact the final purification of all foul matters has been due to the work of micro-organisms from the beginning of life on our planet, and that their work has been to restore organic wastes to their inorganic elements so as again to allow of their being used for building up the life processes of plants and animals through successive generations.

On the occasion last year of giving the course of Chadwick Lectures on Sanitation at the London University I attempted to explain the processes that are now being invoked for the purification of sewage in a popular form, and, after dealing with the chemical aspects of the subject from the practical side, I endeavoured to describe the biological conditions that are necessary in order to arrive at satisfactory results. As these were put in the simplest way, avoiding technicalities as much as possible, I hope I may be allowed to make one or two quotations. There are two terms, aerobic and anaerobic, which are in constant use, for which we are indebted to the illuminating genius of Pasteur. They represent the dividing-line between two kinds of micro-organisms, viz., those than can and those that cannot live without air; but it is a line that is frequently crossed. Without going into details, it is sufficient to observe that whether or not a particular organism can or cannot work in only one or in both of these conditions, the difference between the results achieved by the two classes of bacteria is of the most remarkable kind.

The anaerobic changes come under the general term of putrefaction, and the aerobic of oxidation, but they each break down organic substances into simpler molecular forms. About the great difference that exists between the two processes there cannot be any doubt, seeing that one produces gases that can be used as illuminants, and the other, the aerobic group, those that will put out the light of a candle. The work of the two kinds of organisms, from a practical standpoint, must be judged from the effect they have in carrying on the required changes to the necessary standard of purification in any particular case, and the whole object of the process is to take the greatest possible advantage of their natural functions. Unfortunately the subject has hitherto been approached from an altogether unscientific standpoint, seeing that it has never been subjected to any method of measurement. The result has been, what must always be expected from rule of thumb, that no real progress in a scientific sense has been achieved at all, and though a Royal Commission has been sitting for more than ten years and spending large sums of money upon the collection of a vast accumulation of facts and figures, these can be of little value until they can be correlated in terms of a common standard of comparison, in comprehensible terms. In such a case an architect who is only concerned with practical results, but who is anxious to obtain some reasonable and definite knowledge such as he can obtain in other branches of his profession from text-books that deal with accurate and scientific data, may well be forgiven if he is quite fogged when a client appeals to him for advice on the subject of sewage treatment by bacterial processes, and I am afraid that if he applied to the Royal Commission on Sewage Disposal for specific advice they could only refer him to reports and minutes of evidence and appendices that would make confusion worse confounded and be altogether beyond his comprehension.

One point is fairly obvious, that an architect has to deal with the problem in one of its simplest forms because, while there are many disturbing factors in the case of town sewage by reason of trade wastes and other complications, he has to deal with it in a fairly normal and uniform condition. It follows that if any real progress had been made in the direction of a standard method of disposal the architect should have been the first to be able to take advantage of it.

Turning your attention for a few minutes to what actually does occur when micro-organisms convert organic matters into their inorganic elements, it may be well to refer you to the highest results that have ever been obtained in the purification of purely domestic sewage by bacterial processes. It happens that the information is given in a much more detailed form than in any other experiments, because the changes are shown as they actually occur during the process of filtration. They are known as the Ashtead experiments, and are clearly set forth in the table. Without going into technical details it will be sufficient to point out that the great object is to convert the polluting nitrogenous substances into the mineralised form of nitrogen as nitric acid, in which they were originally assimilated by the life processes of the plant or animal. This is done by the conversion of the ammonia, and you will see from the table that as the one of these is decreased there is a corresponding increase in the other. This may be regarded as the whole *rationale* of the process. The results were obtained by first subjecting the sewage to the action of the anaerobic or putrefactive fermentation carried on by organisms that do not require air, but assimilate the chemically combined oxygen in the organic matter itself. It was long a question as to how long this putrefaction should be allowed to continue, but as the result of experiments which I carried out for a committee of the Surrey County Council quite recently it was shown that with a well-arranged filter a wide range in the period of the putrefactive fermentation was permissible without seriously affecting the results.

The most recent installation that has been carried out on these lines has been for Messrs. Forsyth & Maule at a large country house in Berkshire. Here the sewage is first delivered into a chamber in which a deep dip-stone is fixed. The effect of this is to force the incoming sewage in a downward direction so as to allow the heavy inorganic matters to fall to the bottom, provision being made for its removal as occasion demands. The sewage overflows from the forward end of this chamber into the same kind of apparatus which I used in my Ashstead experiments, and to which I gave the name of a "cultivation-tank." The object of this arrangement is to allow the sewage to impinge upon the surfaces of stones, with which the tank is filled, and which provide a permanent nidus or resting-place for the anaerobic bacteria. Whether it is the best arrangement possible may be called in question, but at any rate it is the one which has given far higher results than any other as regards the final effluent it discharges from the filters. The sewage remains in the "cultivation-tank" for a period that depends upon the ratio between the rate of flow of the sewage and the cubic capacity of the tank, after deducting the displacement due to the flints or stones, and this must necessarily vary much longer during the night, and much less during the day, and so on. In order to meet the case of the house being empty or full, the tanks are arranged in a group of four. All irregularities are no doubt a disturbing factor, but from the recent experiments referred to a considerable range of variation makes no material change in the results. The effluent from the cultivation-tanks escapes at practically the same level as the intake, and is then carried in a pipe to a distributing apparatus, known as Fidian's, which is self-acting, and is revolved by the weight of the liquid itself, which falls evenly over the surface of the filter and discharges by its own gravity, first, through 3 feet of graded filtering material, and then through another pipe and distributor over and through another filter which was provided to meet the case of having to discharge into a river celebrated for its trout. Although this arrangement is practically the same in most respects as the one which I used partly as regards the preliminary anaerobic tank in 1892, and wholly in the Ashstead experiments in 1897, I do not think it fails in any way to give effect to the most advanced ideas of the present day, but it has one great disadvantage, and that is its cost. Although I have devoted nearly twenty years to its development and have contributed a full share of my time in attempting to put the whole subject on a more scientific and satisfactory footing, I cannot but think that in the case of country houses, at any rate, there must be some more simple and inexpensive means of arriving at equally satisfactory results. I must also admit that, although the apparatus I have described was based upon the results of long experience, it, too, has been carried out to some extent by rule of thumb, and it is a question with me as to whether it would not have been better to get the actual facts beforehand with regard to this particular sewage. The difficulty is that doing so would have entailed the employment of a chemist and the use of a testing-apparatus beforehand, which in the case of small installations would be regarded as too expensive, though in nine cases out of ten it would be far the cheapest procedure in the long run.

In towns, where millions of pounds of the ratepayers' money have been absolutely wasted upon schemes that have been approved by the Local Government Board, but have proved futile, it is a different matter, because in such schemes the cost of arriving at definite information and safe conclu-

* A paper read by Mr. W. D. Scott-Moncrieff at the last meeting of the Architectural Association.

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sions beforehand would be trifling, whereas in the case of an ordinary country house it may be prohibitive.

One thing I ought to refer to is the question of nuisance arising from smell in small bacterial installations, and the other is that of the attention required to keep them in proper working order.

I have found that in cultivation-tanks and similar arrangements there is a period in their maturing that generally occurs about a fortnight from the sewage being first applied, when very offensive odours may be expected, but that this passes off in a few days and afterwards smells only occur during certain changes in the weather that are not frequent, such as when it is thundery or during a very low barometric pressure. This, of course, is not pleasant, but in the light of recent knowledge there is no reason to suppose that these odours have any really bad effect on health. Of course, this may not hold good in the case of nervous people who make up their minds that an illness and a smell are in the nature of cause and effect because they noticed a smell so many days before the illness commenced, but the experience of those who have to deal constantly with sewage works, and who are an exceptionally healthy body, shows that these smells are not dangerous. The case of Birmingham may be quoted, where twenty millions of gallons of septic sewage are being actually sprayed into the atmosphere within a short distance of the town without a protest of any kind. This is, I think, carrying matters too far, and, even if my prediction that Birmingham will one day have a rude awakening by reason of an epidemic of some sort is not realised, in any case the system is most offensive.

When these cultivation-tanks receive a little intelligent attention they go on doing their work for years without trouble of any kind. One installation occurs to me which was put down by Mr. Philip Webb about fifteen years ago in the neighbourhood of East Grinstead, and has worked quite satisfactorily ever since.

Where a sufficient fall is available and an efficient system of bacterial filtration adopted there is no difficulty in disposing of the effluent by passing it into any stream that is not used for drinking. In the case of Staines it is allowed to pass into the Thames direct from the filters. When filtration is not available it requires a very porous soil to admit of the discharge being disposed of in underground open-jointed pipes. In such cases it is better to pass it through long shallow channels on the surface of the land, though this, of course, can only be done when the necessary land is available.

I still think that some more simple devices may be found for dealing with the drainage of country houses than those which I have described, and I hope it may fall to the lot of some of the younger members of the Architectural Association to discover them.

Mr. W. H. Seth-Smith, in proposing a vote of thanks to the author of the paper, said he supposed every architect even with a few years' experience had had to deal with the disposal of sewage and drainage. To the architect it was a problem of direct and personal interest, and often it meant very great anxiety. It was said that a little knowledge was dangerous, but he wholly dissented from that opinion when they were considering such a subject as drainage. There could be no question that unless they began with a little knowledge they would never gain more, and therefore it was of immense importance that the members of the Architectural Association should get preliminary knowledge of such matters, so that as their practice increased they would become experts in the drainage of their own houses. He was interested to hear the lecturer's view as to the degree of leakage which could be discovered by the water test, and his warning or condemnation of a drainage system under the house. In clay soil it was questionable whether leakage ought to be allowed to continue, because the pipes were apt to become congested by any large amount of leakage, though they would not be justified in going to the expense of reconstructing the drain if the leakage was small. The question of the ventilation of the municipal sewer up the house drains had for architects more than one point of interest. They had all of them felt how hideous were the municipal ventilators, and they would do a great deal to banish such eyesores, but they had definite views as to the danger of allowing the sewer to be ventilated up the pipes of their houses. The most important point raised by the author of the paper for them as practical architects was the dealing with drainage in a country house and the disposal of the sewage in a small area on a small site, where there was no public sewer. He was not sure, from what they had heard, how far the instance of Messrs. Forsyth & Maule would help them on the point. He wished to know the distance between the house and the septic tank, and again from the septic tank to the aerobic beds. It was comparatively easy to adopt such a system where the distances were considerable, and he had used it in an instance of his own, where 3,000 gallons of sewage per day had to be treated. They must ask, therefore, for a little information and advice as to the best method of disposing of sewage on small sites. It was easy on a chalk soil, when a cesspool could be made 20 feet deep, but when the soil was not of that nature, even if it was soft, light sand, the system was a dangerous one, and in soft clay it was impossible.

Mr. Ernest Herbert seconded the vote of thanks, and agreed that in dealing with a moderate-sized country house they all found difficulty in the disposal of sewage. Even at the present time there was little definite information to help them decide whether they were right in adopting one of the filtration systems or whether it was not better to rely upon the old-fashioned cesspool. Personally, he preferred in the country to adopt earth closets, for, with a man to look after them, they were better than a bad water system. The point that he particularly asked the author to elucidate was the question as to what he thought was the better system to adopt in an ordinary sized house where the spraying system was prohibited. The speaker's own view was that for smaller houses, where manual labour could be used in getting rid of all that was offensive by turning over the ground into which the sewage was allowed to drain, the cesspool system was to be preferred.

Mr. F. J. Osborne Smith said the question of the defective drain, as to whether it should be renewed or not, depended, of course, very much on its position in relation to the building. If the drain ran near the foundations, and the soil happened to be clay, the leakage would certainly be detrimental to the structure. Then, again, it was not while the drains were working perfectly that trouble occurred, but when they were choked and the water test was applied. With regard to soil pipes, he was in favour of keeping them as small as possible. Referring to the drainage of country houses, the speaker said the trouble they had to deal with was, as much as anything, the intermittent flow of the sewage. The house would frequently be uninhabited for long intervals, and the whole system got out of order. If Mr. Scott-Moncrieff could give some suggestions for overcoming the faults due to an intermittent flow, they would be most useful to many architects.

Messrs. Horace White, H. W. Mann, R. A. Dibdin, and Dr. E. Stanhope Kitchin also joined in the vote of thanks.

Mr. Scott-Moncrieff, in his reply, said the difficulties of the architect were inversely proportioned to the amount of land at his disposal. The problem of dealing with sewage on a small site was extreme, and the speaker said he frankly admitted that some such system as that of Mr. Poore's could be accepted as the best solution of it. The method of the cesspool was still an unsolved problem, and in the neighbourhood of a sufficiently closely inhabited district, the author thought a public system of drainage was the best arrangement to adopt.

THE SOCIETY OF ARCHITECTS.

A MEETING of the Society of Architects was held on Thursday evening, the 11th inst., Mr. G. E. Bond, President, in the chair.

Mr. T. R. Richards, F.R.I.B.A., hon. auditor, made a report on the revenue account and balance-sheet. Taking into consideration, he said, the fact that the past year had been exceedingly bad from a business point of view, and that the Council, recognising this, had written off many debts for arrears, it might perhaps be a matter for congratulation that the Society was able to show an increased revenue from its main sources of income and also a very considerable surplus for the year.

On the motion of the President the balance-sheet was formally adopted.

The President then delivered an address, the full text of which was published in *The Architect* of November 12.

Mr. F. Eedle moved a vote of thanks to the President.

Mr. Ellis Marsland seconded the motion and congratulated the Council of the Society on the spirit it had shown in tackling successfully the question of new premises. In their new home they would be able to conduct the business of the Society with greater efficiency, but he impressed upon the members the need for a hall for holding their meetings, and urged them to complete the new building in that respect. Referring to the President's remarks on registration, he said that looking back on the attitude of the Institute it was curious to

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remark how every year brought them nearer to the views of their Society on that subject, and in time he believed the Institute would adopt the proposals contained in the Bill in their entirety.

Messrs. C. P. Monson, C. H. Mead, David Morgan and G. A. Birkenhead also joined in the vote of thanks to the President.

EGYPT EXPLORATION FUND.

THE twenty-third ordinary general meeting was held at the rooms of the Royal Society on Friday last, the President, the Right Hon. the Earl of Cromer, in the chair, when the members of committee and other officers were elected. The report of the Hon. Treasurer was read, and the President delivered his address. Lord Cromer said:—

Gentlemen,—I feel that I owe you some apology for addressing you at all on the present occasion. A great English novelist and scholar, Thomas Love Peacock, once said to a friend, "Don't talk to me of anything that happened less than 2,000 years ago; it is not worth knowing." I fear I cannot nearly attain to Peacock's high antiquarian ideal, for, in fact, during my long connection with Egypt my time was so fully taken up with the affairs of to-day that I had but little leisure at my disposal to study the history of the remote past. I had, however, at times a good deal to do with what I may term the administrative side of Egyptology, and I will presently refer more precisely to some of the difficulties which had to be encountered in treating this aspect of the question. First, however, let me allude briefly to the great and satisfactory change which during the last few years has taken place in the interest which this subject evokes amongst our own countrymen. When I first went to Egypt, now more than thirty-two years ago, Egyptology was a sealed book save to a very few Englishmen. Since then a whole school of British Egyptologists has sprung into existence, some distinguished by the trained intelligence and perseverance which they have brought to bear on the work of excavation, others by the learning and research which they have displayed in interpreting the history of the past. The names of Petrie, Sayce, Naville—whom we may almost claim as a countryman—Budge, and many others will readily occur to you. Younger men are treading in the footsteps of these veterans—Lyons, whose departure from Egypt is a great loss in many ways, Griffith, Newberry, Hunt, Grenfell, Quibell, Weigall, and others. These have gone hand in hand with those representatives of the Anglo-Saxon race who live on the other side of the Atlantic, for instance, with Davis and Breasted.

These, gentlemen, are satisfactory symptoms. We are no longer in the ruck, but in the van of that learned and inquisitive army which is advancing with the fixed determination to discover whatever secrets the sands of Egypt have still to reveal. Then, gentlemen, there is another change which has perhaps not yet taken place, but of which I am sanguine enough to hope that the dawn is not far distant. It may confidently be stated that the time is gone, never to return, when any indigenous Egyptian authority would suggest such an act of vandalism as the employment of the massive blocks of the pyramids in the construction of a dam on the Nile. The spirit of modern Egyptian government is more accurately symbolised by the unfeigned regret displayed by the various authorities concerned when the cruel necessities of engineering obliged them at Philæ to choose between the alternative of respect for the work of past and neglect of the interests of present and future generations. Never again can there be any question of applying portions of those beautiful mosques, which Herz Bey has done so much to preserve and restore, to such ignoble services as forming the lintels and doorposts of some *café restaurant*.

Gentlemen, there is no surer barometer of the progress a nation has made than the extent to which it takes an interest in its past monuments. It has been truly said that men never begin to study the antiquities of their country till they are saturated with civilisation. Well, gentlemen, modern Egypt is now so far saturated with civilisation that the advance in material prosperity during the last quarter of a century has been unexampled in the history of the world. The foundations of all that we call civilisation have been well and truly laid. Moral advance naturally lags behind, and limps painfully onward, like prayers following on sin in the famous metaphor of Homer. But it is not too much to hope that in the earnest, though perhaps at times somewhat erratic, endeavours now being made by the present race of Egyptians to rise to higher ideals than any which would have been cherished by their forefathers, they will not forget the claims of their historic past. I trust that in no very distant future it may be possible to include some Egyptians in the category of distinguished Egyptologists.

And now, gentlemen, I turn to another point. I have said that I have had at times a good deal to do with the administrative side of Egyptology. Let me say in this connection that I do not think that in the course of my long connection with Egypt I remember a single question of importance arising which it was possible to treat exclusively on its own merits. If some change was proposed in the fiscal or judicial system of the country to which the assent of the Powers was necessary—and in most cases of importance their co-operation was indispensable—considerations which at first sight appeared not even remotely connected with the special point under discussion had to be taken into account. At one time an eye had to be cast on the relations between the British and German Governments in the distant Pacific Ocean. At others, French policy in Madagascar, or Italian policy in connection with Abysinnia, might have to be weighed in the balance. As was to be expected, questions of a different character to those which attracted attention in the early days of the occupation are now acquiring some prominence; but it cannot be too clearly understood that throughout the preliminary period of Egyptian reform, which lasted for wellnigh all the years during which I held office, the main difficulties which had to be encountered arose from the cosmopolitan character of Egyptian institutions, and from the diverse and often conflicting interests of non-Egyptians in Egyptian questions. The fact was unfortunate, but nevertheless practical men had to recognise its existence. That even Egyptology could not escape from this taint was abundantly proved by the negotiations which took place in 1904. Dead Pharaohs were able to revenge themselves for what they would have considered the desecration of their tombs by casting the apple of international discord amongst those who disturbed their ancient solitary reign. I am aware that it is held by some whose opinions are entitled to respect that in the course of the negotiations of 1904 Egyptology was to some extent sacrificed to policy. That Egyptology had to be considered in the course of those negotiations I readily admit, and I may add that I make the admission with some regret, for personally I favour the opinion that all matters connected with endeavours to add to the stock of knowledge of the world should be kept wholly outside the domain of politics. But I altogether demur to the statement that the interests of Egyptology were sacrificed. Consider what has happened. At the instance of the French Government, an engagement was taken that the head of the Archæological Department in Egypt should always be a Frenchman. Was this an excessive demand on the part of the French? I cannot think it was. The French were really the fathers of Egyptology. It surely was not surprising that national pride should have been evoked in maintaining some supremacy in a branch of knowledge rendered illustrious by the names of Champollion, Mariette and others. Would it not have been, to say the least, ungenerous to deny the validity of this claim at a moment when, in spite of every effort to avoid friction, a proud and sensitive nation was wincing under what they considered a loss of predominant influence in Egyptian affairs? I think it would have been so, and for my own part I may say that it was real friendship, rather than political necessity, which impelled me to advocate this concession. Nevertheless, had I thought that the essential interests of Egyptology would suffer, I should have withdrawn my advocacy. But in what way can those interests suffer? We have a right to expect two things of the French, and my firm hope and belief is that in neither shall we be disappointed. In the first place we have a right to expect that the head of the Archæological Department shall be a man well fitted to fill the post, both as regards knowledge of Egyptology and in respect to other qualifications. I do not suppose that France, or, indeed, any other nation, is suffering from what I may call a plethora of Masperos; but although it may be difficult to find anyone endowed with the very special qualifications possessed by the very distinguished Director-General of the day, I see no reason to doubt that on his retirement, which I hope is still far distant, his mantle will fall on the worthy shoulders of a countryman trained in his own school of learning, conciliation, and liberal thought.

The other thing which we have a right to expect is that there shall be no exclusiveness either in appointments to the Archæological Department or in the treatment of unofficial explorers—in other words, that the traditions of M. Maspero, or I should rather give him his well-earned English title, Sir Gaston Maspero, shall be continued. I hope and believe that in this respect we shall not be disappointed.

Gentlemen, it may perhaps be thought that I am not an impartial witness on this subject, for I frankly confess that I

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know more of politics than I do of Egyptology. Moreover, I regard the Anglo-French agreement of 1904, followed, as was anticipated, by the friendly understanding with Russia, as the most important incident connected with the foreign relations of Great Britain which has taken place for many years past. I shall always look back with pride and satisfaction to the fact—which you will perhaps pardon me for mentioning—that for more than twenty years I laboured incessantly, through good and evil repute, to create a state of things in Egypt which facilitated the conclusion of that agreement. The very numerous critics of Egyptian affairs who dwell on the shortcomings in Egyptian reform—shortcomings of which none are more aware than myself—perhaps hardly lay sufficient stress on the very serious evils which would certainly have arisen had impatience at the obstacles to reform been allowed to predominate, and had any attempt been made to cut the tangled knot of Anglo-French petty dissensions instead of slowly and laboriously unravelling them. But for all that it would be a matter of unfeigned regret to me if I thought that these advantages had been gained at the cost of sacrificing those very important objects in which the audience I am at present addressing are specially interested. I trust that the observations which I have ventured to address to you may serve to remove from your minds any impression that such a sacrifice has been made.

The work of the Society during the past year was summarised in the address of the Hon. Secretary (Mr. J. S. Cotton), who first referred to the losses by death that the Society had sustained, particularly Mr. Frederick George Hilton Price, the late President, and Lord Amherst of Hackney. The Hon. Secretary said:—

As regards the Egypt Exploration Fund proper, you will recollect that in 1907-8 we had no expedition; but we started some excavations again last winter on a concession at Abydos, under the direction of M. Naville, with the assistance of Mr. Ayrton and Mr. Loat. The work at Abydos itself consisted mainly in clearing and preparing ground for the coming season. A large piece of untouched ground on the south of the tombs of the Old Kingdom, and behind the temple of Rameses II., was dug over, and the remains of two roads, formed of late pottery vases laid in long parallel rows, were discovered, and several small objects were found. Further, the upper edge of an immense trench was traced, which it is hoped may prove to be an analogous construction to that discovered seven years ago behind the temple of Seti I., the so-called Osireion, partly excavated by Professor Petrie, and described by Miss Murray. This new trench lies in the axis of the temple of Rameses II., just as the Osireion lay in the axis of that of Seti. To the north of the temple of Rameses were found the remains of a Coptic church, built on the foundations of a small temple of Thothmes III., which we shall clear out in the coming season. A cemetery of the Vth Dynasty of some four hundred graves was cleared, and yielded a variety of objects, including a considerable number of copper vessels.

Whilst these excavations were proceeding, information was received through native sources that a pre-dynastic cemetery was being plundered at El-Mahasna, some eight miles north of Abydos. So soon as the necessary permission from the Egyptian Government had been procured, the camp was moved thither, and in the space of a month the cemetery yielded a large number of objects of the greatest interest, many of which were on view at our exhibition in July. Among them was a pottery vase, with hippopotami moulded in relief on the rim, and another with painted hippopotami; a group of important ivories, including figures of men and animals; vases, wands, bracelets and combs, slate palettes, and a copper harpoon. The last-named object is of great interest, since by carefully dipping the end into paraffin wax it was proved that a rope had been attached to the head, as in the familiar hieroglyph for *wa* "one."

The other two branches of the Fund, the Archæological Survey and the Græco-Roman Branch, had no expeditions in the past year. The former was allowed to lie fallow, as we had completed the work at El Amarna, and Mr. N. de Garis Davies had taken over work for the Metropolitan Museum of New York, and there was sufficient material for publication on hand. It was desirable, moreover, to accumulate funds before proceeding to a new field of survey, to which I shall have to refer later on. The Græco-Roman Branch has also been inactive owing to the illness of Dr. Grenfell, which has thrown so much work on his colleague, Dr. Hunt, that it was impossible for him to go out. This Branch also will, however, resume work in the coming winter.

I will now briefly report on the work that has been done by other Societies and workers in Egypt during the past season. It has been a rather quiet year. There has been no sensational discovery, but plenty of solid work has been done.

The Egyptian Service of Antiquities has expended its energies largely on the survey of Nubia, which was rendered necessary by the decision of the Government to raise the dam at Assouan. It was continued by Dr. Reisner, and carried southwards a little beyond Kalabsha. Then he resigned his position as director, which was taken over by Mr. Firth, who has since continued the survey to Koshtamna, sixty-five miles south of Shellâl, leaving about forty-five miles still to be surveyed. Their work has consisted chiefly in exploring cemeteries of various dates from quite early times down to the New Kingdom, after which there is little evidence of remains till Ptolemaic times. Valuable ethnographical results are promised. Besides this, Signor Barsanti has carried on the work of repairing and strengthening the temples in the same region which have been so much neglected in the past, and are now threatened with destruction by drowning. Unhappily, archæologists who have been there recently do not give very favourable reports of the way in which the restorations have been carried out. Scholars of various nationalities—M. Gauthier, Dr. Roeder, and Messrs. Blackman and Dixon—have been engaged in copying the inscriptions.

At Thebes Mr. Weigall has continued his admirable work of protecting the existing monuments and enlisting the interest of the natives in their preservation. At Karnak M. Legrain has been hard at work with his re-erection of the fallen columns in the hypostyle hall of the temple of Amon. It will soon be restored very nearly to the state in which it was in the time of Rameses II.

Further north, at Saqqara, Mr. Quibell has devoted his season to uncovering the monastery of Apa Jeremias. A space of nearly four acres has been excavated, presenting a mass of irregular buildings, which date from about A.D. 520 until their final destruction, probably in the eighth or ninth century. The earlier architectural work was very fine, and is displayed in a large number of capitals and sculptured blocks of great beauty in themselves, and of importance in the history of art, as their material shows them to be of local workmanship. Two churches have been found: a small earlier one, in which the capitals were all of the Corinthian type, and which seems to have been converted later into a burying-place for the archimandrites and other principal officials. In the later and larger church the capitals offer a great variety of details, and approximate in type to the Byzantine style, as seen in St. Sophia and at Ravenna. The largest room found was the great refectory, a hall 22 by 13 metres, with a small chapel to the south-east, once separated by a wooden screen. The floor of the room was almost untouched, and on it were many inscriptions, often merely names, with the prints of men's feet cut in the stone. These must have marked the places where the brethren stood or squatted at meals. In an open paved yard south of the refectory was a pulpit, much like the Arabic *mimbar* in appearance, and probably its ancestor. A series of cells of monks was found. Some of the monks seem to have had more than one room; in this case it was the inner room that contained the prayer-niche or oratory. A considerable number of wall paintings have been uncovered, which will afford material for the future historian of Coptic art. Among the inscriptions found is a list of feast days for the year, with the allowance of wine for each feast. Unfortunately, no MSS. have yet been discovered, though this monastery must have been one of the most important in Egypt. Doubtless its proximity to the capital exposed it to an early and too thorough destruction at the hands of the Arabs.

Among English expeditions, the most important work was done by Professor Flinders Petrie for the British School of Archæology in Egypt. He worked with success on two sites, first at Gourneh, on the west bank of Thebes. There, on the top of the cliffs, was found a chapel of King Sankhere of the XIth Dynasty, which Professor Petrie believes was erected on the occasion of the King's Sed festival. He also discovered a new temple-site of the XIXth Dynasty, and a remarkably complete and interesting burial of a lady of the XVIIth Dynasty, one of the finest untouched private burials ever found in Egypt. He further found some new painted tombs, one containing an interesting group of dancing girls of the XVIIIth Dynasty. Later in the season Professor Petrie moved to Memphis, where he discovered the palace of Apries (the Pharaoh Hophra of the Bible). It is a building 400 feet long by 200 feet wide, with walls preserved from 10 to 15 feet high. The middle court is well over 100 feet square, and the stone columns in it were over 40 feet high. The stone-lined halls, of which seven remain, were over 40 feet long and half as wide. The brick halls were nearly

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as large, and the walls were about 15 feet thick. A still larger court extended on the north side, in which lie capitals of columns which must have been about 50 feet high. In spite of the difficulties with water, &c., the work at Memphis promises to yield results of the greatest importance for Egyptian history.

At Abydos Professor Garstang dug through several cemeteries, and discovered a number of objects of interest belonging to almost every period from the IInd Dynasty to Ptolemaic times. They include fine alabaster vases from the VIth Dynasty and a set of coppersmith's tools and utensils, two good XIIth Dynasty daggers, and some gold jewellery of the XVIIIth Dynasty.

America has furnished the sinews of war for several undertakings. In Nubia Dr. Randall MacIver and Mr. Woolley conducted excavations for the University of Pennsylvania, and explored an XVIIIth Dynasty town opposite Wady Halfa. Within the town walls they found some graves of the XIIth Dynasty, one of which yielded a fine collection of jewellery, while another produced the earliest iron weapon recorded from the Nile Valley. It is a socketed, leaf-shaped spear-head, about nine inches long. This work is unfinished, and will be continued in the coming season.

At Thebes Mr. Theodore Davis prosecuted his researches in the Valley of the Kings. In a tomb which appears to have belonged to a noble of the reign of Tutankhamen and Ay he found an alabaster figure of the deceased man, executed in a modified El Amarna style; while on some fragments of gold foil Tutankhamen himself is depicted in his chariot slaying Asiatics.

At Thebes, too, Mr. N. de Garis Davies has commenced a great work for the Metropolitan Museum of New York. He proposes to copy the more important private tombs in full and in exact facsimile, and where advisable in colour. He has already made good progress, as he has completed the tomb of Thotemheb, and has some two-thirds of the charming little tomb of Nekht in colour and to full scale. This tomb will be vividly remembered by all who have visited the Theban necropolis.

The Metropolitan Museum was also responsible for the work of Messrs. Lythgoe and Mace at Lisht, where the XIIth Dynasty pyramids and tombs are being carefully explored. Mr. Lythgoe, further, has excavated an extensive Coptic cemetery in the oasis of Khargeh.

Germany has been represented by an expedition to the Fayûm in search of papyri, and Dr. Zucker has taken back to Berlin a considerable collection discovered on the site of the ancient Philadelphia. A very useful work has been accomplished by Professor Schäfer and Dr. Junker, who have made a complete set of copies by photography and otherwise of all the inscriptions on the Temple of Philæ, the original records being doomed to disappear before very long.

Such are the principal results of the season's work. And now I will say a few words as to our forthcoming publications. For the Fund proper we shall shortly publish a final or possibly two volumes on the XIth Dynasty temple at Deir-el-Bahari, giving full architectural plans and details; and later on a volume by Mr. Ayrton, giving an account of the results of the work at El-Mahasna.

For the Archæological Survey the next volume will deal with the first results of Mr. Griffith's work in the Sudan, to which I shall refer immediately.

The Græco-Roman Branch will be represented by another volume of *Oxyrhynchus Papyri*, number VII. of the series I need say no more as to this, as you will have the advantage of hearing Dr. Hunt tell you something about it this afternoon.

And lastly, I have a word to say on the work that we propose to carry out in the coming winter.

Our principal effort will be at Abydos, where we shall have an expedition under the direction of Professor Naville as heretofore. I regret that we can no longer avail ourselves of the services of Mr. E. R. Ayrton, who has done such excellent work for us during many years, as he has accepted an important archæological post from the Government in Ceylon. We have secured a successor to him in Mr. T. Eric Peet, an archæologist with a wide knowledge of Italian and Ægean antiquities, as he has shown by his recent important volume on the Stone and Bronze Ages in Italy. He has had a training under Professor Garstang in Egyptian work, and has worked with him at Abydos, so that he is well acquainted with the ground, and will be in a position to take up the work at once with a full knowledge of the local conditions, and we may look forward to a prosperous season there. I may add that Mr. Peet was a Craven Fellow at Oxford, and has recently been elected the first Pelham Student in that University. He will have Mr. J. A. Dixon as assistant. M. Naville is here, and has kindly undertaken to fill in the details of the proposed campaign.

For the Archæological Survey we are entering on a new phase. As you know, for some years Mr. Davies was occupied for the Survey in reproducing the paintings in the private tombs of El Amarna. His records will be of permanent and very great value, as the originals are rapidly disappearing. He completed his admirable work with the sixth volume of "El Amarna," and he has now passed into the service of the Metropolitan Museum of New York. So we have had to look out for a new field. It was felt that as England had made itself responsible for the development of that great tract of country which lies south of Egypt proper, viz. the Sudan, and as the Sudan contains a number of antique remains belonging to races which for centuries were subject to Egypt and were imbued with Egyptian civilisation, it would be very desirable that our Society should take a share in working out these relics of the old Meroitic empire. The inscriptions of these remains are partly in Egyptian, that is the ordinary hieroglyphic, and partly in a language which has so far not been deciphered, but is written in two scripts, one a peculiar form of hieroglyphs, and the other a cursive character.

Recent finds have largely increased the number of Meroitic texts, and only three or four months ago Dr. Budge published the facsimile of a MS. recently acquired by the British Museum in the same cursive script; the subject of the work is guessed at with probability, but the MS. has not yet been deciphered. A complete decipherment of these old monuments of the kingdom of the Upper Nile would open a new and interesting chapter of history. Mr. Griffith, to whom the Survey is so much indebted in every way for years past, is now on his way to the Sudan for the purpose of collating the old and acquiring fresh Meroitic material; and he proposes to make this material and the resulting investigations the work of the Survey for the next two years. He is already well on the track of reading these inscriptions, and I believe there is little doubt that his efforts will be crowned with success.

With regard to the Græco-Roman Branch, we are proposing, as Dr. Hunt is prevented from going out himself, to send an expedition under Mr. A. M. Blackman and Mr. J. de M. Johnson to dig for papyri in the district between Behnesa and Ahnas, more familiarly known to you perhaps as Oxyrhynchus and Heracleopolis. Mr. Blackman has already worked under Drs. Grenfell and Hunt in the Fayûm, besides having considerable archæological experience in other parts of Egypt. Mr. Johnson, who has also had experience in Egypt in a civil department, was recently elected to a Senior Demyship at Magdalen College, Oxford, and proposes to devote himself to the study of papyrology.

This concludes what I have to say to you this afternoon, and now it only remains for me to thank you for listening so attentively.

Addresses by Dr. Hunt on the work of the Græco-Roman Branch and by Professor E. Naville on the excavations at Abydos were also delivered.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

AT the annual gathering of the Society at the Queen's Hotel, Leeds, on Thursday evening, November 11, Mr. Percy Robinson, F.R.I.B.A., delivered his presidential address. He said:—

In the first place I must express my thanks to you for electing me to this honourable position, and I can assure you that I shall continue to use my best endeavours to carry out the duties of the position so as to promote the interests and welfare of our Society.

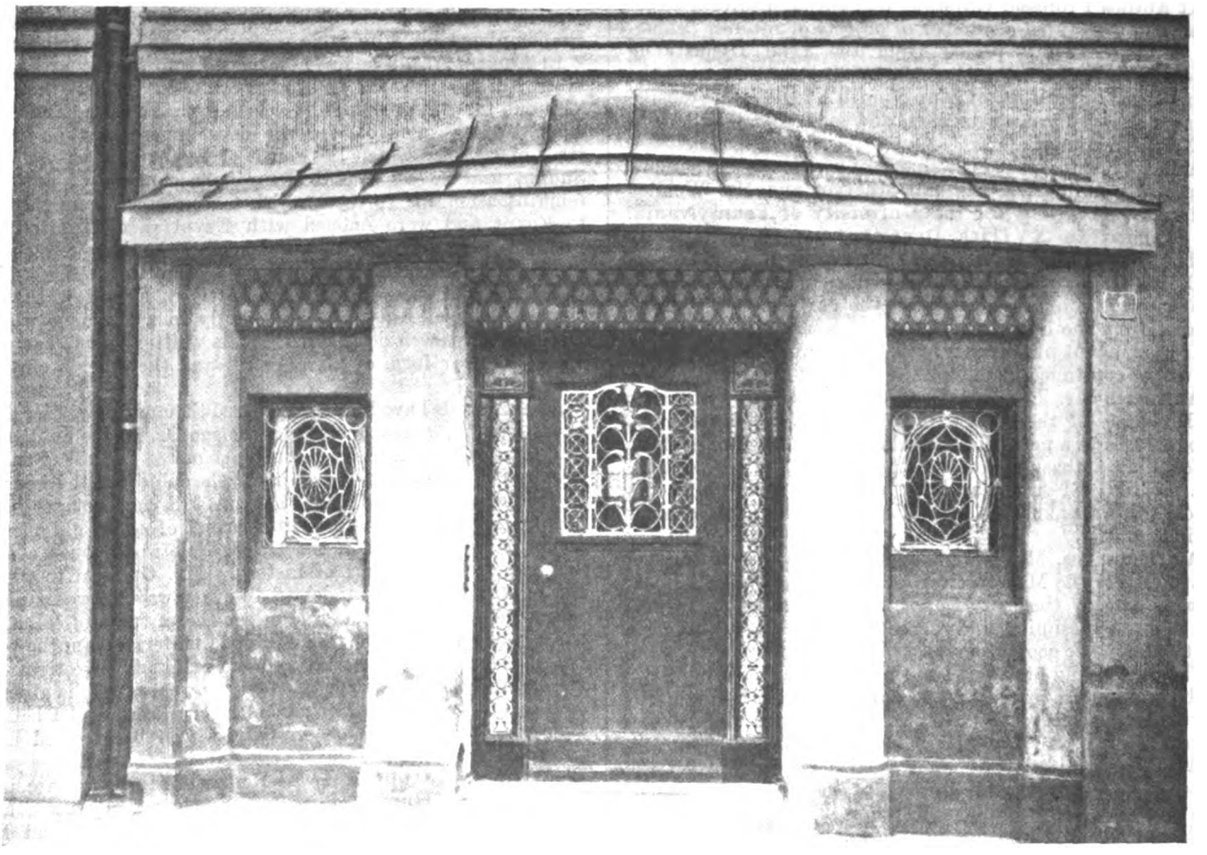
You will see from the Secretary's report that we are still maintaining our steady progress. Our membership is greater than ever before, and our financial position is as sound as ever, whilst the attendances at our lectures and meetings continue to show a marked improvement.

Amongst the events of the year locally I may mention the Health Congress which was held in Leeds under the auspices of the Corporation and University, acting in collaboration with the Royal Sanitary Institute and the Royal Institute of Public Health, when 1,100 delegates assembled to exchange their views on the various aspects of sanitary science. Your Council took an active part in assisting with the organisation, and one of our members, Councillor G. F. Bowman, was appointed chairman of the engineering and architectural section.

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MODERN EUROPEAN ARCHITECTURE.

BAVARIA.



DETAIL OF ENTRANCE TO BLOCK OF FLATS, AUGSBURG.—Krauss & Durr, Architects. [From *Der Profanbau.*

As your President I was invited to deliver an address, and selected as my subject "Some Aspects of Town Planning in Relation to Health," in which I took the opportunity of advocating the importance of due consideration being given to the artistic side in all city development, pointing out the relation or interdependence of beauty and health and the influence of environment upon the mind and life of the people.

Amongst other papers bearing more directly on architecture was one by Dr. Fremantle on Letchworth Town Planning. This was followed by an interesting discussion, in which Mr. E. T. Hall, V.P.R.I.B.A., and Mr. R. T. Kirkby, A.R.I.B.A., and other architects took part.

The question of town planning still looms large upon the architectural horizon.

During the year a deputation of German town planners has visited this country and was received by the R.I.B.A. A large number of English architects and municipal representatives interested in town planning have also visited the principal Continental cities in order to study the methods in vogue there and gain some idea of the results that have been obtained.

One of the most notable events in this direction during the past year has been the endowment of a chair of civic design at Liverpool University through the generosity of Mr. W. H. Lever, the founder of Port Sunlight and one of the pioneers of this movement.

Mr. S. D. Adshead has been appointed the first professor, and we have been fortunate in securing his services to deliver a lecture during the coming session on this question of town planning, when I trust, in view of the importance of the subject, we shall have a large attendance not only of our own members, but of municipal representatives and others interested.

The Town Planning Bill is still before Parliament and is receiving the usual buffeting about which invariably falls to the lot of controversial matters or legislation introducing new principles and ideas. It is to be hoped, however, that the Bill will not be sacrificed to meet the exigencies of the political situation, because whatever opinions there may be upon the methods of procedure and minor details, there is no doubt that the vital principle is good, and we as architects ought certainly to endorse it.

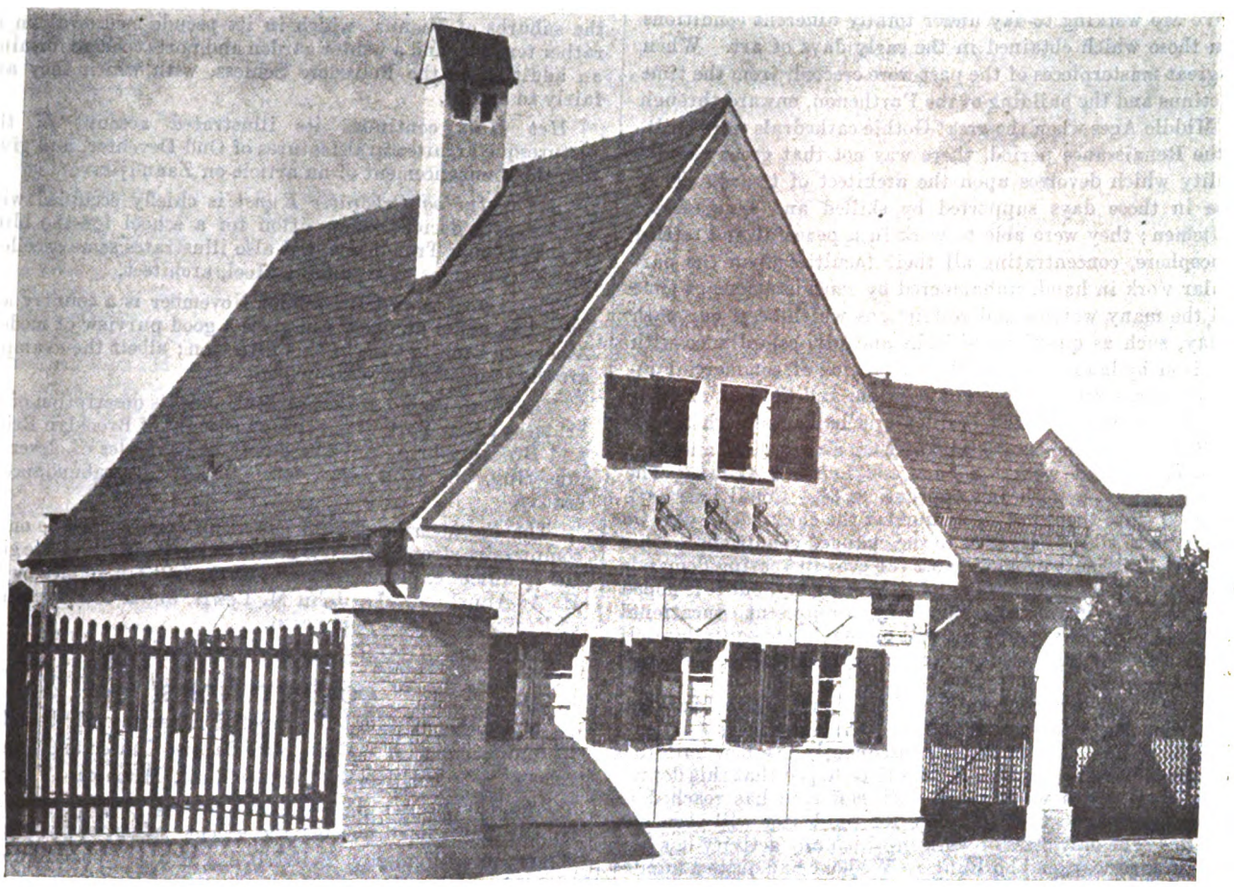
Speaking on this matter last year I suggested that the local advisory committees proposed to be formed in connection with town planning schemes might be useful not only in connection with the immediate object in view, but that the scope of their work might well be extended to watching over the artistic amenities and evolution of our towns and cities in other directions. This idea has taken a concrete form in New York, where, at the instance of the late President, Mr. Roosevelt, following a suggestion made by the American Institute of Architects of Washington, a Council of Fine Arts has been created, and directions have been issued that for the future "before any plans are formulated for public buildings or grounds or for the location or erection of any statue," the heads of executive departments, bureaus, and commissions must submit the matter to the Fine Arts Council and follow their advice, "unless for good and sufficient reasons the President directs otherwise." We have in such an action as this evidence not only of the enterprise of our brethren across the seas, but of their growing appreciation of architectural art, and it is an example that we might copy with advantage.

Leeds, like many other cities, has grown in a haphazard fashion without any definite plan of development, and as a result we are suffering in all directions at the present day from this lack of foresight. We have dog-legged streets wandering about in an apparently aimless fashion and leading to nowhere in particular. We have our public buildings scattered about in all directions and cramped up on ill-considered sites. Our library and art gallery in a back street, and our latest acquisition—the statue of Queen Victoria

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MODERN EUROPEAN ARCHITECTURE.

BAVARIA.



A PORTER'S LODGE.—KRAUSS & DÜRR, Architects. [From *Der Profanbau*.

—is stranded on its pedestal in a desert of cobble pavement without any relation or connection with its surroundings. All this is due to the lack of a properly thought-out comprehensive scheme in the beginning.

Civic art has even a commercial value quite apart from the influence it may have on the lives of the citizens. This fact is usually lost sight of by the man who is absorbed in business pursuits: he fails to realise that it pays to have beautiful streets and beautiful cities, but such is undoubtedly the case, and if Leeds is to become the shopping centre of the North, which is the ambition of our tradespeople, it is well that they should bear this in mind and do all in their power to render it attractive.

Then, again, had our cities been developed on town-planning lines, there would have been other and more tangible results which would appeal more directly to the average rate-payer. Enormous sums of money would have been saved which have been spent in street improvements and in undoing what has been done, whilst profits might have been made from the acquisition of undeveloped land. In several German cities no rates are levied, because long ago they foresaw the direction of the growth of the suburbs, acquired land for new thoroughfares, and bought cheap land, the rent of which now pays for the public services.

If we were able to start *de novo* with the assistance of a Town Planning Bill and the advice of a committee, such as has been suggested, we might produce a very different Leeds from that which exists to-day, but our efforts are perforce restricted to making improvements as opportunities arise. Much good work has already been done in this direction. The centre of the city has undergone a considerable transformation of late years, and at the present time a great area of insanitary buildings is being demolished and the district remodelled under the guidance of one of our members, Councillor G. F. Bowman, who is chairman of the development committee.

The work executed by our students shows a distinct advance year by year not only in draughtsmanship and a grasp of constructive principles, but it shows evidence of independent thought, new ideas, and, above all, ambition. The future of our art is in the hands of youth, and youth without ambition is an empty vessel; it is therefore encouraging to see these signs of new developments and the setting up of new ideals. Whilst we must recognise that we cannot cut ourselves entirely adrift from tradition, that the study of old work must be our starting point, yet we must also remember that it is only a means to an end, and not the end itself. Raking up the dry bones of the past will never produce a living structure, but we may draw upon the past so far as it will help us to solve the problems of the present and enable us to devote our strength to scaling new heights of achievement.

The desire for distinction of some kind tempts one at times to leave the beaten paths and to enter on experiments in new and unfamiliar methods. Such a course demands courage and inevitably leads to many risks and disappointments, but its tendency must be good in that it implies a desire for progress, and it is possible that this spirit which permeates the rising generation of architects, combined with the introduction of modern conditions and methods of construction which demand something outside the traditional forms of expression, may be the means of carrying forward our art in a manner comparable in some degree with the most active periods of architectural evolution.

The greatness of Greek art is due partly to the fact that it was not fettered by tradition, but was free to develop in the way that suited it best, and to establish its own principles, and partly to the favourable conditions and spirit of the age. The Greeks lived in a beautiful world which influenced and found expression in their works. But there is beauty in every age; even now in our restless modern life beauty is to be found by those who seek it, and the student cannot set himself a greater ideal than to produce an architecture true to and expressive of the life of to-day, to grapple with the com-

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plex and difficult problems which arise out of these modern conditions, and turn what appears to be a restriction into an advantage, to mould his difficulties into success, and triumph over his imposed conditions. This is the spirit which, if constantly pursued, is bound eventually to lead to achievement.

We are working to-day under totally different conditions from those which obtained in the early days of art. When the great masterpieces of the past were erected, from the time of Ictinus and the building of the Parthenon, onward through the Middle Ages when the great Gothic cathedrals were built, to the Renaissance period, there was not that great responsibility which devolves upon the architect of to-day. They were in those days supported by skilled and sympathetic craftsmen; they were able to work in a peaceful and settled atmosphere, concentrating all their faculties upon the particular work in hand, unhampered by considerations of time and the many worries and restrictions which beset our path to-day, such as questions of light and air, compliance with cast-iron by-laws, meeting the exigencies of commercial requirements, economy, speed of erection, and the host of other considerations which now perplex and baffle the architect.

Ruskin says the choir stalls at Amiens cost 400*l.* and kept some eight good workmen busy for fourteen years. The carvers got 1*s.* a week and apprentices 8*d.* Conditions have changed since then, but we cannot set the clock back. All we can do is to adapt ourselves to the changed conditions. This becomes a difficult problem with the ever-increasing demands which are imposed upon the architect of to-day, but it is hoped that with the advantages offered by our present educational system the budding architect will be enabled to equip himself in the best possible manner to cope with the difficulties which lie before him.

The past year has been one of the worst which Leeds has experienced, so far as the building trade is concerned, for a long time past, and there are consequently few new buildings of importance to chronicle. It is to be hoped that this depression from which we have all been suffering has reached its lowest point and that a change for the better will soon take place. The only class of work in which any activity has been shown is educational buildings. We have had quite a number of competitions for secondary schools, and in schemes on a larger scale we have had an important competition for a training college at Hull, which has been won by Messrs. Crouch, Butler & Savage, Mr. Thorp being placed second.

In conclusion, I think that although we have had a somewhat barren year from the financial point of view, we have done some good work in promoting the objects for which the Society was formed, and as regards the future of our art the prospect was never brighter.

The President was thanked for his address on the motion of Mr. Butler Wilson, F.R.I.B.A. In seconding the motion, Mr. Bowman took exception to the President's commendation of the Town Planning Bill, a measure which he, personally, regarded as having been framed by a body of gentlemen possessing little knowledge of town planning, and, as such, of little use to a city like Leeds.

The proceedings terminated with a successful smoking concert, which was warmly appreciated by numerous members and friends present.

During the evening the prizes awarded in the Society's annual competitions among the students were distributed.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* contains a third paper on the Architectural Exhibition at the Brooklyn Museum, by Mr. Wm. H. Goodyear, in which he deals further with the deviations in measurement from the normal at Pisa Cathedral and the leaning tower. The illustrations comprise a charming country house near Radnor, Pa., in the "colonial" manner, by Messrs. Cope & Stewardson; a house for the Superintendent of the State Hospital for Insane at Norwich, Conn., by Messrs. Cudworth & Woodworth, and the new Washington Hotel, Seattle, a "skyscraper" by Messrs. Eames & Young.

La Construction Moderne describes and illustrates the Florentine tribune containing the statue of David and other works of Michel Angelo. Other illustrations are a sepulchral monument at Père Lachaise, by M. Rouillière, of very original design, and the new central railway station of New York, *apropos* of the recent visit to Paris of Mr. Whitney Warren.

Deutsche Bauzeitung deals with village churches in reviewing the new monthly *Die Dorfkirche*, and very picturesque are some of the village churches of Germany. As a contrast our contemporary gives an illustrated article on New Synagogues, that in Posen being the text.

Architekten und Baumeister Zeitung illustrates a villa in the suburbs of Vienna, which in its pseudo-mediævalism is rather terrible, and a winter garden and porte cochère forming an addition to the Belvedere Schloss, with which they are fairly in accord.

Het Huis continues its illustrated account of the picturesque architectural features of Oud Deventer, and gives also the commencement of an article on Zaandjik.

Arkitektur og Dekorativ Kunst is chiefly occupied with the recently decided competition for a school for the blind at Dalen, near Trondhjem, but also illustrates some excellent furniture designs by Gudmund Hoel, architect.

The *Architectural Record* for November is a country and suburban house number, and gives a good purview of modern American architecture in this direction; albeit the examples are the residences of wealthy men.

The *Engineering Magazine* continues its description of the bridges of New York City, with an account of Brooklyn Bridge and Brooklyn bridges. These may be examples of clever engineering, but cannot lay claim to any superabundance of beauty.

The *Engineering Record* has an interesting article on the compressive strength of coke breeze concrete, in which are given the results of experiments made at Cornell University by Mr. H. A. Appel and Mr. John M. Lewis, under the supervision of Professor O. A. Johannesen.

COMPETITIONS.

Mitcham.—A limited competition has recently been held in connection with the proposed Baptist Church and Sunday school, to be built in the London Road, Mitcham. The committee invited six architects to submit designs, and from among these have selected the scheme submitted by Messrs. Thomson & Pomeroy, F.R.I.B.A., M.A., of 49 Hill Road, Wimbledon.

Preston. — The Preston Corporation recently organised a competition for a Boys' Grammar School, estimated to cost 12,000*l.* The designs had to be sent in by November 1. The premiums of 50*l.*, 30*l.* and 20*l.* have been awarded as follows:—1, Messrs. Woolfall & Eccles, FF.R.I.B.A., Liverpool; 2, A. J. Greenwood, Manchester; 3, Messrs. Packer, Druit & Druit, Southport.

Wellington.—The designs of Messrs. Shayler, Swan & Ridge, of Shrewsbury, have been selected, in a limited competition, for a secondary school at Wellington, Salop.

Whitchurch.—The designs of Mr. J. Holt, of Manchester, were chosen in a limited competition for a secondary school at Whitchurch, Salop.

GENERAL.

Mr. L. Rome Guthrie, architect, has changed his offices to 13 John Street, Adelphi.

The Llandrindod Wells Town Council have received the sanction of the Local Government Board for a loan of 6,000*l.* for the erection of a pavilion in the recreation ground.

The Joint Isolation Hospital Board recently constituted in the Isle of Wight has decided to erect, at a cost of some 8,000*l.*, a large permanent isolation hospital for the treatment of infectious diseases, on a site purchased near Newport.

The Local Government Board have sanctioned the borrowing of the money for the erection of the new Grammar school at Wolsingham, which will be proceeded with without delay. The cost of the new school will be about 10,750*l.*

The British Committee of the Venice International Exhibition of Fine Arts has been requested by the municipality of Venice to announce that it has been decided to hold the ninth Fine Art Exhibition at Venice in May of next year, and not in two years' time, as originally arranged, this decision having been arrived at in order that the exhibition may not clash with that to be held in Rome in 1911. At the exhibition last spring the sales of pictures in the British section were larger than those of any other country except Italy.

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The Architect.

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FORTHCOMING EVENTS.

Monday, November 29.

Royal Institute of British Architects: Business Meeting.

London Institution: Paper on "An Architectural Journey from Noyon to Rheims," by Mr. Henry Beaumont.

Tuesday, November 30.

Institution of Civil Engineers: Continuation of discussion on three papers read at the meeting on Nov. 9.

Wednesday, December 1.

Royal Archæological Institute: Paper on "The Symbolism of the Crocodile in the Middle Ages."

Monday, December 6.

Liverpool Architectural Society: Paper on "The Development of Suburban Building Estates," by Mr. C. H. B. Quennell, F.R.I.B.A.

Surveyors' Institution: Paper on "The Direct Payment of Rates," by Mr. C. P. Hall, agent to the Duke of Bedford.

WESTMINSTER ABBEY.

THE careful examination of the muniments of Westminster Abbey which has resulted in the publication some short time ago of the history by JOHN FLETE, a monk of the house from 1420 to 1465, and now in an account* of the facts recorded in the fabric rolls of the Novum Opus, the building of the nave, by the Rev. R. B. RACKHAM, has rendered possible a more correct and authoritative description† of much of the architectural history of Westminster by Mr. FRANCIS BOND, than the deductions from the fabric itself of Sir GILBERT SCOTT and Mr. MICKLETHWAITE.

The Rev. R. B. RACKHAM gives us many interesting details connected with the building of the nave of Westminster from 1376 to 1528. He tells us who were the men that found the funds and the sources from which they were derived, "the builders and architects who were original enough not to seek after originality in their work," but adhered to the lines of the design carried out for the eastern part of the church, the presbytery, choir, and transepts. We are informed of the localities from which came the stone, the marble, the timber, and the lead, the rate of progress and the vicissitudes and delays that occurred. Collecting the various sums recorded as having been spent on the building of the nave and making allowances for the years for which the accounts are missing, the cost of the work in modern values amounts to between 252,000*l.* and 315,000*l.*

As illustrative of the assistance that the examination of contemporary records has afforded to the correct historical understanding of the Abbey Church we may instance a point in which Mr. RACKHAM differs from the conclusions of Mr. MICKLETHWAITE. The latter in his diagram of the Abbey, given in FEASEY and MICKLETHWAITE's "Westminster Abbey," 1899, has marked the clerestory of bay 5 and the roof of bays 5 and 6 as "1500-1512." Mr. RACKHAM points out that Mr. MICKLETHWAITE did not know that the roofing was begun in 1469 and finished in 1479, with the exception of a portion at the west end, and that the stone vaulting was put up quite independently of the roofing and after the roof had been completed. Hence the clerestory walls of bay 5 must have been finished before 1479.

Mr. RACKHAM disagrees with the view held by Mr. BOND that Abbot ESTENEY began his vaulting of the nave at the west end, although admitting that this theory clears away the difficulty of the Tudor badges and would agree with the testimony of JOHN FELIX, a monk of Westminster from 1525 to 1537. Although allowing the possibility of Mr. BOND's view being correct, Mr. RACKHAM adheres to his own conclusion that ESTENEY began with bay 7 and worked westwards. Thus even the work that has been so well done in the investigation of the fabric rolls of the Novum Opus does not completely solve all the problems connected with the building of Westminster Abbey, but it adds very largely to our knowledge and to the data from which correct deductions may be made in many directions.

Mr. BOND's monograph of Westminster Abbey not only deals with the history of the Coronation Church of England which JOHN FLETE described as "Caput Angliæ diademaque regni," but is intended to illustrate the meaning of a monastic or collegiate church, and the standpoint of those who devised its form and of those who contributed to its magnificence. As the author emphatically explains, such churches as Westminster were not built for the purposes of a congregation, for the use of man, but for the glory of GOD and the Saints; hence the planning is not arranged to suit the convenient accommodation of a large body of people, but for worship by small numbers at frequent intervals—in fact, practically continuous day by day, month by month, and year by year.

In his elucidation of the plan of Westminster, Mr. BOND cleverly explains in popular terms the use of the church (1) by the monks, (2) by pilgrims, (3) by the general public, (4) by Royalty, (5) by the King's Treasurer, and extols the excellence of the arrangements made and provided for the several functions that the building was intended to fulfil. In his explanation of the plan the author shows how this was modified from time to time, starting with the Norman Church of EDWARD THE CONFESSOR. With regard to this we quite agree with the suggested plan as Mr. BOND presents it, both because it closely follows the practically universal type of Romanesque apsidal churches prior to the full development of the chevet, and because we cannot understand the meaning of *subter et supra* in the passage quoted otherwise than as referring to chapels projecting both from the transepts *subter* and from the apse *supra* of the *principalis aræ domus*.

When we come to Mr. BOND's chapter on "Principles of Design" as exemplified at Westminster, we cannot say that beyond some pretty writing he has at all made out his case that the measurements of 511 feet long, 100 feet high, and 35 feet broad, and no other, were the most suitable dimensions for Westminster. Especially is it trifling with common-sense to assert that the accom-

* *The Nave of Westminster.* By the Rev. R. B. Rackham, M.A., of the Community of the Resurrection, communicated by the Dean of Westminster to the British Academy. (London: Henry Frowde. 5*s.* net.)

† *Westminster Abbey.* By Francis Bond, M.A., F.G.S., H.A.R.I.B.A. (London: Henry Frowde. 10*s.* net.)

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modation required "could not be compressed into less than 511 feet" of length, or that "to make the church a single foot longer would have meant unnecessary expense and waste." In this we think Mr. BOND has allowed his justifiable enthusiasm for the beauty of Westminster to run away with his judgment. He is on far more solid ground when he explains the simple and admirable proportioning of nave arcade, triforium, and clerestory.

Few will be inclined to agree with the conclusion at which our author arrives that the Church of Westminster was designed by a French architect whose name is unknown, and carried out by English architects, HENRY of Westminster, JOHN of Gloucester, and ROBERT of Beverley. Our author should not be too dogmatic on the point, for in the time of HENRY III., Westminster, both court and monastery, was French to the core. Neither English nor Latin were allowed to be spoken, but French only, and HENRY of Westminster must have been quite as French as the monks of the cloister. It is not impossible, then, that in setting out the lines of the church HENRY of Westminster may have been the architect who designed Westminster in accord with French fashion. Certainly we think Mr. BOND is again carried too far by his enthusiasm when he says, "No English architect, whether he went to France on a short or on a lengthened visit to study French Gothic on the spot, could have designed Westminster." It cannot be maintained that an English architect, impregnated with French sympathies, could in the thirteenth century be less capable than in the nineteenth, the eighteenth or the seventeenth, of adapting the feeling and principles of an alien method of design.

In his account of the building of the nave of Westminster, the work of the fourteenth and fifteenth centuries, Mr. BOND follows very closely the history as gathered by Mr. RACKHAM from the office rolls of the Novum Opus, though, as we have already noted, he does not necessarily or always agree with the deductions drawn therefrom.

The building of HENRY VII.'s Chapel is the occasion of much enthusiastic laudation from our author, albeit he points out how far from its founder's original desire the execution of the scheme departed. In all this, whilst ostensibly teaching the purport and meaning of architecture, Mr. BOND is writing for the Philistine, for whom his book is clearly primarily intended. Hence the explanation of the inclusion of a Visitors' Guide as a large part of the volume on Westminster Abbey. Admirably written and containing a wealth of historic information, Mr. BOND'S latest work is rather one for the layman than for the professional student, and it is therefore regrettable that the author should have made dogmatic assertions on matters of opinion in which few serious students of architecture would be ready to agree with him.

NOTES AND COMMENTS.

THE important meeting of auctioneers, estate agents, and surveyors held on Thursday in last week at the Cannon Street Hotel, London, should be sufficient to convince any fair-minded person, and even an out-and-out supporter of the present Government, that the land taxation clauses of the Finance Bill are not only dangerous in principle, but unworkable in practice. The meeting was absolutely non-political, as every one practising as an auctioneer, estate agent, and surveyor in and around London had been invited to attend. It was also a meeting of those who knew what they were talking about, who were better fitted than any other body of men to comprehend what would be the effect of the land taxation clauses if they were carried, and what were the difficulties, one might say almost the impossibilities, of correctly arriving at the valuations that the Chancellor of the Exchequer's proposals involved.

THE resolution of protest against the land clauses affirmed that in the opinion of that representative meeting of the professional men of this country who know most about land and land values, "that if the land clauses of the Finance Bill become law the result will be disastrous to the nation, as the effect will inevitably be permanently to destroy all confidence in what has been hitherto rightly considered the premier security for investment of capital; values cannot fail to be very considerably depreciated; owners and mortgagees of properties will suffer heavy losses on realisation; development of land for building will be seriously interfered with, and to a great extent stopped; and capital which has hitherto been invested in land and house property and in mortgages, by means of which building operations have been financed, and large numbers of people have been assisted in purchasing properties, will be withdrawn and sent out of the country."

AMONGST the defects of the land clauses pointed out at this great gathering of experts were that the taxation proposed is a serious inroad on the capital of the country; that there is no monopoly in land, but at the present time there are thousands of acres wanting purchasers; that land and land values are not to-day the property of the rich, but of the thrifty poor man; that the cost of valuations required by the Bill, which the Government estimated at two millions sterling, could not be carried out for anything like that amount; that there is absolutely no basis for the estimation of site value apart from the buildings and other improvements placed upon the land, and above all, that whilst inflicting serious damage and creating widespread distrust the proposed taxes were utterly useless for revenue.

To architects and to architecture the injury to the building trade and to the employment of capital in building that has already resulted from even the proposals of the Finance Bill, and that must be still more intense if the Bill were passed, is sufficient to condemn the attack on landed property that is the real object of the proposed land taxation and valuation.

THE House of Lords in its judicial capacity has given an important decision in allowing the appeal in a Scotch action of the North British Railway Company against the Budhill Coal and Sandstone Company and others, whereby it is laid down that building stone is not included in "the mines of coal, ironstone, slate, or other minerals" which by the Railways Clauses Consolidation (Scotland) Act, 1845, as by the English Railways Clauses Act, a railway company is not bound to purchase with the land required for their purposes. That is, freestone or other building stone, being the ordinary rock of the district, is not a "mineral."

THE past season's work at the excavations of Old Sarum has been principally occupied with the removal of fallen masonry and rubbish from the inner bailey, hence not many objects of interest have been as yet discovered, though there are a number of architectural fragments that give information as to the character and date of the great tower, "the tower above the postern," referred to in a Literate Roll of 1246. Some Roman as well as mediæval bric-à-brac, indicates the possibility that earlier antiquities than the Norman period may later on be brought to light.

AN agreement of useful character between quantity surveyors and master slaters and tilers is recorded in "The Standard System of Measurement of Slating and Roof Tiling" adopted by the Quantity Surveyors' Association, and the "Customary Rules of Measurement" issued by the London Association of Slate Merchants and Master Slaters. Difficulties have sometimes arisen in recent years owing to the different methods of measurement in use for cuttings and other extras on slating and tiling. These have now been brought into line by the simple plan of lineal measurement by quantity

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surveyors, and an agreement as to how much superficial area should be recognised by the master slaters as intended to be conveyed by the lineal measurements. Thus the old practice of adding an allowance to the superficial area of slating by quantity surveyors will be abandoned, whilst the master slaters will still be able to charge their customers by superficial measurement.

THE grievance of the "Trafford Park Estates, Ltd.," a company trading in land, at the injury they would suffer by the land clauses of the Finance Bill has been formulated in an appeal to the House of Lords, and is an illustration of the hardship which would be inflicted not only upon this company, but upon many other owners who have bought land on which an increment has arisen prior to the purchase by the present holders.

THE Board of Education has agreed to modify the arrangement of the paper in Perspective in the Board's Art Examinations by dividing into two the section of the examination which contained questions involving the use of instruments and requiring accurate measurements for their solution, so that candidates may select an easy question if they aim at no more than a "second class" success, but must take one of the normal difficulty if they aspire to the Art Class Teacher's Certificate. The section of the examination dealing with what we may call the freehand application of perspective remains unaltered.

WE note that in the course of his Hermione lectures at Alexandra College, Dublin, Sir WILLIAM RICHMOND, in speaking of Greek sculpture and the work of PHEIDIAS, drew attention to the fact that amongst the Greeks the cold colour of marble was felt to be unsatisfactory, and that the chryselephantine statue of ATHENA was but one example of the general use of colour upon statues, of which the eyebrows, eyes, and borders of garments were painted, the lips touched with red, and even upon the cheeks was implanted the flush of health. But, said Sir WILLIAM, there was in this colouring nothing offensively life-like; on the contrary, instead of realistic representation, the treatment was no more than a suggestion of life made with taste and skill. How this colour was applied was largely a matter of conjecture: probably it was done with wax. The colour sense of the Greeks was very likely derived from the Persians. It cannot, we think, be too often repeated that in the best periods of both sculpture and architecture—Egyptian, Greek, Roman, Mediæval, and Renaissance—colour was always an accompaniment of form. The idea of pure white marble or stone as the most fitting means of expression for architect or sculptor was a heresy that was unknown before the eighteenth century, and even so was not generally accepted until the nineteenth century.

Is it worth while to win a competition for the post of architect to a municipal building? Judging from the experience of Messrs. SILCOCK & REAY with the Cornwall County Council offices one would say not. After many months of delay and interviews with committees, some of them apparently, from what was said at the last quarterly meeting of the Council, not very pleasant for the architects, it has been decided that tenders may be obtained on the understanding that they shall not exceed 15,000*l.* including the Council Chamber. How very pleasant to win a competition with about the cheapest design submitted, and then spend months in fighting to prevent it being utterly ruined by what is probably foolish cheese-paring. The great economist of the Council expressed his desire at the quarterly meeting to knock out the portico. Evidently the Cornwall County Council want their office building to be a work-house and to look as much like one as possible.

ESSENTIALS IN ART.

AT the Dowdeswell Galleries in New Bond Street, W., there has been on exhibition since the commencement of the month, and will continue open until December, a collection of pictures, church and domestic decoration, &c., by Mr. Reginald Hallward. The reception offered to them by the critics of the London and provincial papers has been marked by the greatest diversity. Their originality—to use a mild phrase—could not possibly meet with unanimous acceptance, for anything that is a departure from time-honoured principles always arouses instinctive distrust and scepticism. Some critics regarded the exhibition as the work of an earnest apostle of a new gospel, while others looked upon it as the spurious product of a trickster and poseur. Mr. Hallward was moved to attempt to justify his aims and incidentally to protest against the cant and superficial knowledge that he considered passed for competent criticism. It is always refreshing to listen to a man with strongly individual and rational views. Hence, when it was announced that Mr. Hallward would lecture on "Essentials in Art" at the Gallery on Thursday of last week, it was not surprising to find that the room was well filled. But many must have gone away disappointed if they came expecting to hear an attack on newspapers and their critics, for Mr. Hallward in his first words explained that his intention was not to deal with the essentials in his own art, but with the principles of art as old as the Egyptian and Greek sculptures. Such a subject could scarcely be treated in the pure abstract under such personal circumstances, and, as a matter of fact, there is a strong personal, though not egotistical, note throughout the lecture.

One of the difficulties that beset the artist is, he said, the necessity he is under to create the means of his own expression. Despite the conflicting views of different schools, he is more likely to be condemned than praised for not adopting one or other of the modes in vogue. The public bring all their prepossessions to assail the unfortunate artist who, having his own special vision of beauty, has to create his own self-expression. Those who preach the prevailing theories about art seek to interpret it in a narrow way and to exclude all that does not answer to a very shallow and partial interpretation. Above all they promulgate that formula which dates the birth of painting from Velasquez, thereby confusing the issues of art and detaching it from life. They treat art as an exotic for the rich and the cultured and having its roots in vice. Whereas to others art is rather the flower of a nation's life springing from the nobility and happiness of a people. Such theories only consider those directions of art which are purely external and naturalistic.

Mr. Hallward described its axiom—"truth to nature"—as being no less nauseous than "art for art's sake." A moment's attention and comparison of a work of great art like Gainsborough's "The Watering Place," or "The Virgin of the Rocks," by Leonardo da Vinci, with nature will, he asserted, explode their theory that art is only imitative and not creative. Goethe wrote that the artist has to raise nature to his own conceptions—meaning that it is the idea penetrating the form that gives value to art. The theory of art for art's sake, which would detach it from any intention or idea, is contradicted by the "Sower," a picture by Jean François Millet, in which is heard almost the very voice of religion itself.

The nation has been led too long, declared Mr. Hallward, by those who interpret the arts not as they minister to the well-being of life, but as they minister to selfish ambition, pride, and exclusiveness. One leading critic wrote that what was now desirable was "not vastness and strength and iron durability, but lightness, swiftness, delicacy, and a ready and sensitive response to the slightest currents of feeling," and that the right vehicle of the age was not fresco but water-colour. This philosophy is no more true than the statement that the arts are dependent on mere trading and fashion and whims.

The effect of all these doctrines has been to enormously increase the difficulties of artists who do not conform to them and whose object is the love of beauty and desire for its expression, whose desire is to transmit their feelings and ideas through the vehicle of form and colour. People are only now beginning to free themselves from these widely-disseminated heresies. The moment they understand that art is not nature, but the interpretation of nature (a language totally different to the "truth to nature" theory), they will find it interpreting their own lives and giving satisfaction and happiness. The essential quality of art is that it is the vehicle of moods, ideas and feelings which dominate and guide the form—which is not nature, but nature interpreted through the language

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of art. The greatest philosophers unite in declaring it is the idea behind it which is the force in a work of art.

Mr. Hallward, in applying these principles to the State encouragement of art, said it is evident that as the only source of art is the artist himself, the best evidence of true encouragement is the occupation of the best artists and craftsmen in the widest use of their powers. Yet what employment was offered to Blake (who lived on 10*s.* a week), Rossetti, Alfred Stephens (who ended his life with a pistol-shot), Maddox Brown, Watts, and others in their lifetime by the State? Almost none. The money is devoted not to the help of men of genius, but in the creation of art-masters and the enlistment of more and more students. Surely there is a grave defect in a system which leaves the artist out. The only encouragement offered to them is to cease to be artists by selling their birthright for lucrative official posts and thereby to escape the cares, toils, and privations which beset the artist of independence. The volcanic force of the arts is in struggle and aspiration, in independence from power. The State-endowed artist, with all the advantages of his official position, influence, and income, competes with his brothers who are confronted with hardships and struggles, and finally he loses sight of the sources of strength and comes to hate independence.

The art school stereotypes craft. Professor Lethaby, its leading spirit, in a recent interview, stated, "What we mean by art needs to be explained as quality of workmanship." But this, said Mr. Hallward, is not art at all; it is purely craft. Plato said that art was a low thing unless attached to the idea, and it is that low thing that is being fostered throughout the country at the cost of art. Craft of all kinds is easily learnt. Raise it to art and express something through these crafts, and only then do the mighty difficulties begin. So long as one kind of technical proficiency is made the test the public will look for the wrong thing and encourage the bad. Happily an uncertainty is gathering in the public mind as to the reasonableness of continuing to subsidise more officials and to extend a system so ill-informed as to the nature of art. Professor Lethaby has spoken of the desirability of a Conference; what is needed, in Mr. Hallward's opinion, is a Commission to inquire into the working of the whole system and to effect those reforms which are so urgently needed.

Mr. Hallward, in summing-up what he had said as to essentials in art, affirmed the following points:—

1. That art is a language through which the artist transmits feelings and ideas which he has experienced. It is emotion realised in form. Or, as a great writer has said, "Art is a human activity consisting in this, that one man consciously, by means of external signs, hands on to others feelings he has lived through, and that other people are infected by these feelings and also experience them."

2. That therefore the "art for art's sake," or any other partial theory which robs art of this extreme value to life, is false altogether.

3. That a system of art education carried on by public funds which makes the craft standard, and only one aspect of that, the source of art is wholly opposed to its welfare.

4. That as a result of this the public mind is hopelessly confused as to the real purpose and nature of art and its importance to life.

5. That as a direct consequence of this the life of the creative artist having to find his own interpretation is largely a martyrdom, harder than it ever was before.

6. That a Commission is urgently needed to inquire into the whole system, which Commission should be fully representative of unofficial artistic opinion.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last at the premises in Tufton Street, Westminster, Mr. H. Tanner, F.R.I.B.A. (president), in the chair.

The following gentlemen were elected members:—Messrs. W. B. Stedman, R. G. Hopcraft and W. Paramor.

Mr. C. Reginald Enock read a paper, illustrated by lantern views, entitled:—

The Architecture of the Incas of Peru.

A study of the architecture of the Incas of Peru, he said, takes us back into the interesting—almost fascinating—past of what we now call the "New" World. Upon the plateaux and slopes of the great snow-crowned Cordillera of the Andes, fronting upon the boundless Pacific Ocean, towards the setting sun, we encounter a series of ancient buildings and stone structures so remarkable as can only be compared with those of the Nile; to which, indeed, they have a certain analogy, as we shall see.

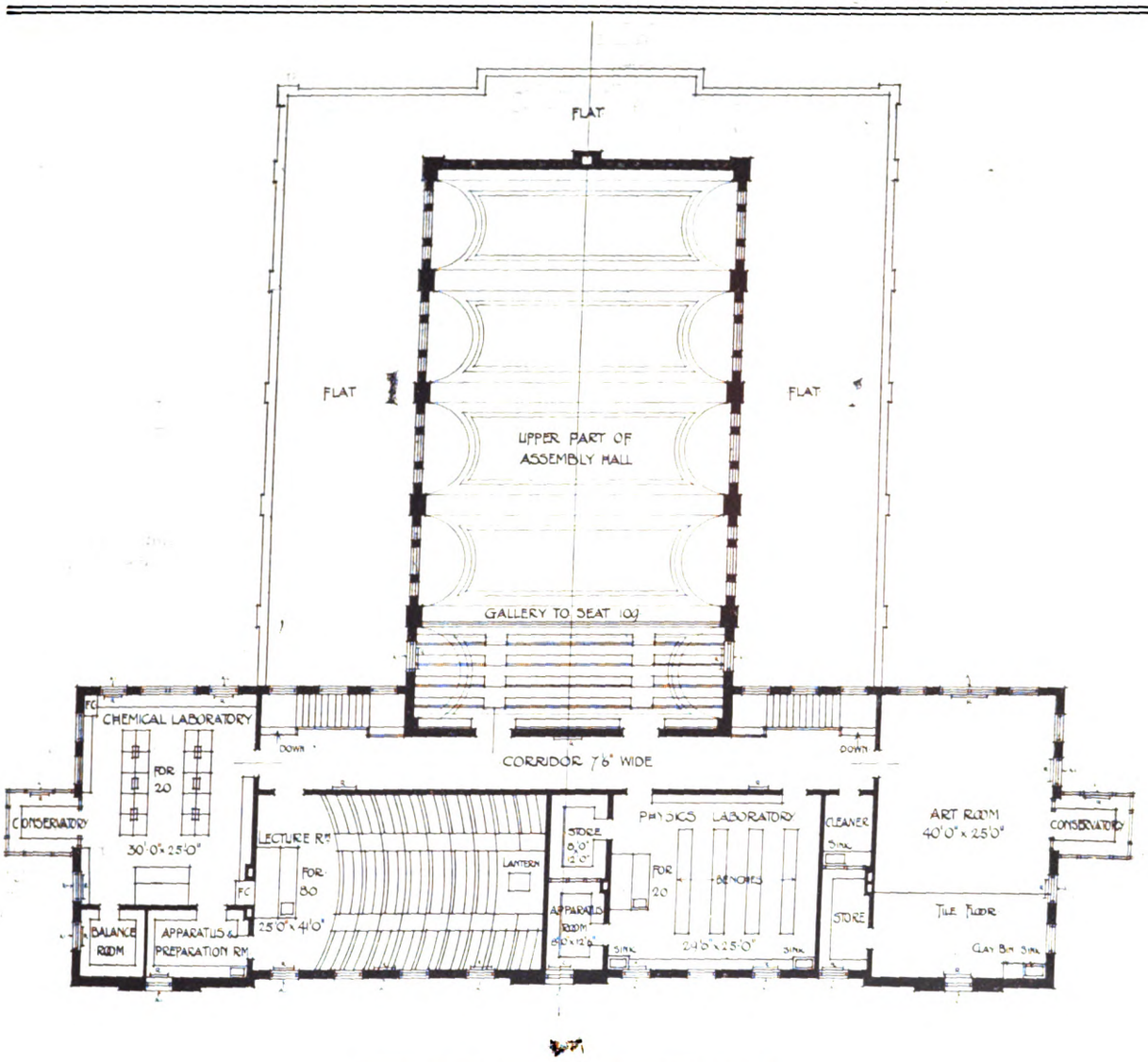
First of all, let us briefly consider—and it is necessary to a proper understanding of the subject—the topographical conditions surrounding the old Empire of the Incas. As we approach Peru from the sea we are confronted with a long, sterile shore, beaten by tearing surf between the few havens. There is no sign of life upon the seaboard, except the cry of the seals and the occasional flights of guano-producing seabirds, which fly at times in veritable clouds upon the face of the water. As for man and his habitations, except for the few seaports and the streets and houses clustered around them, and the irrigated plantations in the vicinity of the few rivers which descend from the Andes to the sea, across the 80 to 100 mile wide strip of coast lands, there is nothing to be seen. The coast lands are mainly sunbeat deserts, which for hundreds of miles separate the valleys where agriculture is possible under irrigation. For the coast-zone of Peru, lying between the foot of the Andes and the Pacific Ocean, is a rainless region—rain never falls there—1,400 miles long, extending southwards into the appalling deserts of Tarapaca, in Chile. Nevertheless, it is upon this coast-zone, which enjoys a generally excellent climate in other respects, that the Spanish-American peoples have mainly taken root; and Lima, the handsome capital of the Republic of Peru, is situated thereon, a short distance inland, as well as other cities.

Crossing this dry coast-zone we rapidly ascend the Andes, and encounter climatic conditions exactly the reverse of those we have left below. Heavy rainfall and snowfall, bracing and rarefied air, and perpetual snow upon the summits are the characteristics of this lofty region, the roof of the South American world. Topographically this region consists of great, high, bleak plateaux, from 10,000 feet to 16,000 feet above sea-level, absolutely treeless; and to reach these from the coast or from the interior, or indeed from each other, we have to cross the intervening ranges of the Andine Mountain system; vast parallel ranges whose passes are rarely less than 14,000 feet above sea level, and whose summits rise in some cases to more than 20,000 feet elevation, far above the line of perpetual snow. I have crossed these inclement plateaux, passes, and summits on many occasions, and retain strong recollections of toilsome yet pleasurable days and months spent on mule-back amid their alternating sunshine, rain, and snow. Some of the snowy passes and peaks, indeed, which I crossed or ascended on foot over the perpetual snow-cap had never been trodden previously by the foot of a white man, nor, indeed, of any human being. The mountain sculpture of the Andes is beautiful and striking; the rising or setting sun tinges the snow-crowned peaks with that ruby glow known only to the Andine or Alpine traveller, and the vast heavenward-pointing ridges of upturned strata of the Silurian or Cretaceous period, and the great uplifts of plutonic rocks form mighty façades and far-reaching Andine towers and aisles—an eternal architecture which surmounts the work of man's hands that lies below, and perhaps has influenced its character.

I have dwelt thus upon the climate and topography of Peru because it bears in an important way upon the architecture of the Incas and pre-Incas who flourished there in past ages. The mural remains of these people, their great monuments in stone and sun-dried brick are found all over the region of the Cordillera, and to a lesser extent upon the coast; and their character varies much in accordance with their situation and climatic environment. Thus upon the rainless coast-zone the buildings were largely of adobe, or sun-dried earthen bricks; the well-known material used throughout Spanish-America to-day, whether in Mexico, Peru, or Chile; whilst as we rise to the rainy region of the mountains we observe that they are of stone, shapen or unshapen. The adobe lasts for centuries on the dry coast plains; it would have perished long ago upon the rainy plateaux and become obliterated; and here it is that the beautiful examples of the stone-shaping art of these pre-Hispanic people is found in its perfection. The whole region over which these monuments are found may be taken as more than 1,500 miles long by 300 miles wide, extending throughout what is now Ecuador, Peru, Bolivia, and part of Chile—an enormous range of territory for a semi-civilised people to influence, and greater than that which included the civilisation of the Euphrates and the Nile together.

The Inca Empire, it will be recollected, flourished as far as can be ascertained from the time of the first Inca, Manco Capac, who founded the dynasty at the beginning of the eleventh century of our era, to the time of the arrival of Pizarro and the overthrow of Atahualpa, in 1532. But the Incas were not the first civilised people of Peru. They were preceded by, and probably inherited their civilisation from, the Aymaras, whom they probably overthrew. The various

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FIRST FLOOR PLAN

SECOND PREMIATED DESIGN FOR TRAINING COLLEGE, HULL. UNIT C.
WILLIAM H. THORP, F.R.I.B.A., Architect.

mural remains throughout the country are, therefore, of different people and periods—some only nine to five hundred years old, others being of much more remote epochs, measured possibly by thousands of years.

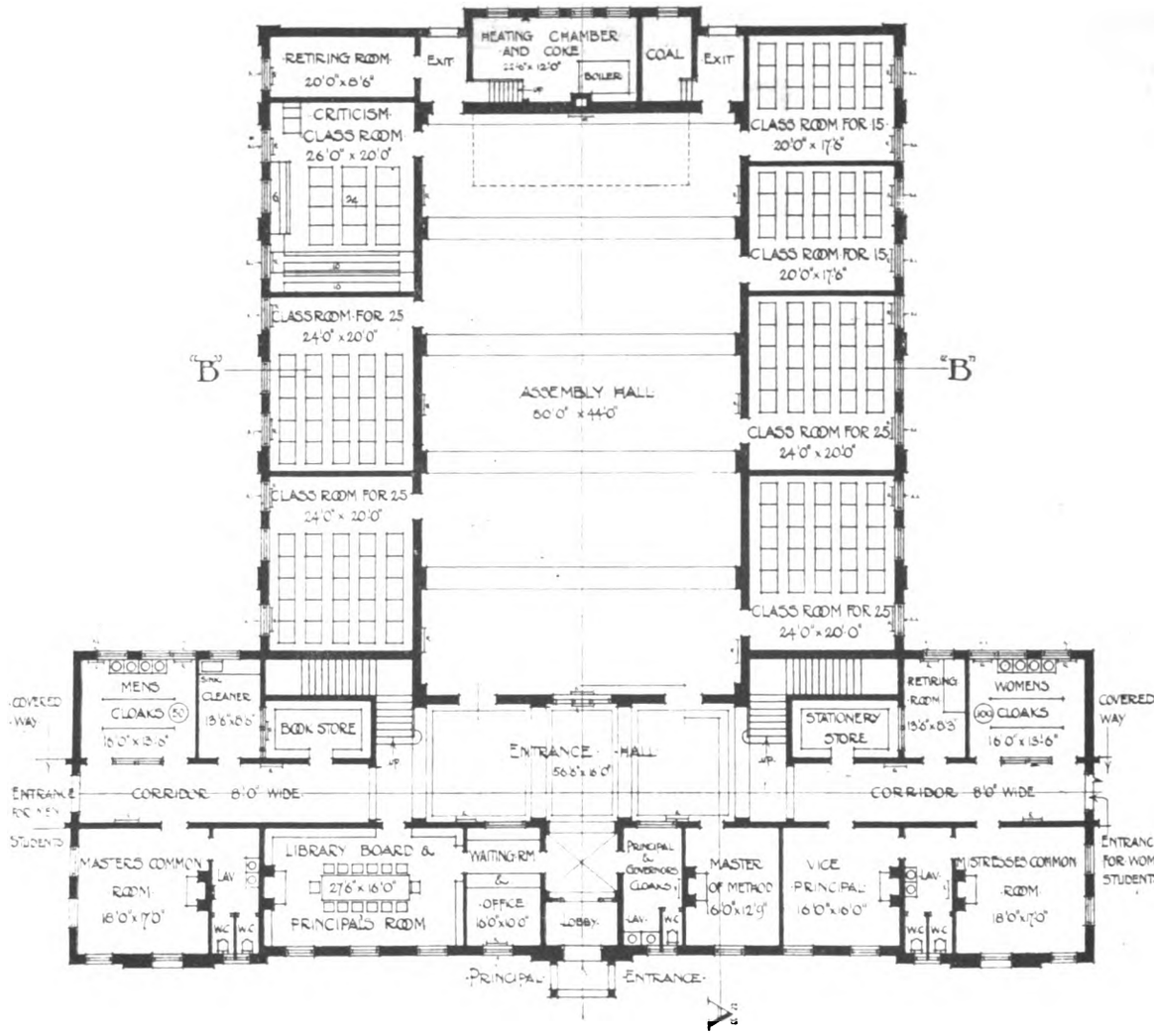
The Empire of the Incas, at the time of the conquest of Peru in 1532, had as its main centre Cuzco—the word itself signifies "the navel"—in modern Peru, and Quito, the capital of Ecuador, upon the equator; and these centres were connected by the famous Inca roads, which some historians—generally those who have not seen them—have described as equal to the roads of the Romans, which statement is far from being true. They were, however, means of communication of the utmost value to the Empire, and although they were nothing more than trails for the llamas, those wonderful camels of the Andes which were the only beasts of burden known to the people, who consequently possessed neither horses nor wheeled vehicles, they gave access from place to place, and were traversed by the remarkable system of posts and postmen maintained by the Inca Government. These roads, from Cuzco to Quito, were more than 1,100 miles long—a distance greater than that from the Euphrates to the Nile. Moreover, as engineering structures even, these roads were of considerable merit, crossing by rock-hewn steps the summits of the Andes above the perpetual snow-line, passing swampy lands by stone causeways, and rivers by means of the remarkable suspension bridges made of woven grass or osiers, and by stone structures.

There were two main roads. They both traversed the country longitudinally along the line of least resistance paralleling the ranges of the Andes. One, the most remarkable, ran along the high plateaux and summits of the Andes; the other followed the lowlands of the coast. The groups of buildings which we are to consider are in some cases disposed along the line of these roads, or are adjacent thereto, portions of the roads only remaining here and there. The structures consist mainly of castles and fortresses, temples, palaces, astronomical observatories, tombs, and groups of habitations or towns. All of these are now abandoned and in ruins, with the exception of some which form part of recent Spanish-American structures at Cuzco. In passing, it may be said that the Moorish type of building inherited from Spain looks exceedingly incongruous and evanescent in comparison with the solid massive Inca masonry beneath it, in the few instances where the two are encountered together.

To describe first the ruins of most notable occurrence. These are situated in the neighbourhood of Cuzco, and upon the region bordering upon the great Lake Titicaca. This lake, it will be recallected, is of its kind the most remarkable in the world, being 12,350 feet above sea-level, and so large that we may navigate upon it out of sight of land. It is remarkable also in being, in company with some other lakes, a hydrographic entity which has no outlet or means of exhaustion for its waters except that of evaporation, as far as is known.

Cuzco is about 200 miles from the lake, and was the great Mecca of the people and the seat of government. Overlooking the city—which to-day is an important, populous place, standing 11,000 feet above sea-level—is what is perhaps the most remarkable prehistoric building in the New World, and indeed in some respects in the whole world. This is the fortress of Sacsaihuaman. It consists of a series of four or more great walls, from 12 feet to 25 feet high, forming terraces up the hillside 1,800 feet long. The walls are built as great revetments, with twenty salients at regular intervals, the

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GROUND FLOOR PLAN

SECOND PREMIATED DESIGN FOR TRAINING COLLEGE, HULL. UNIT C.

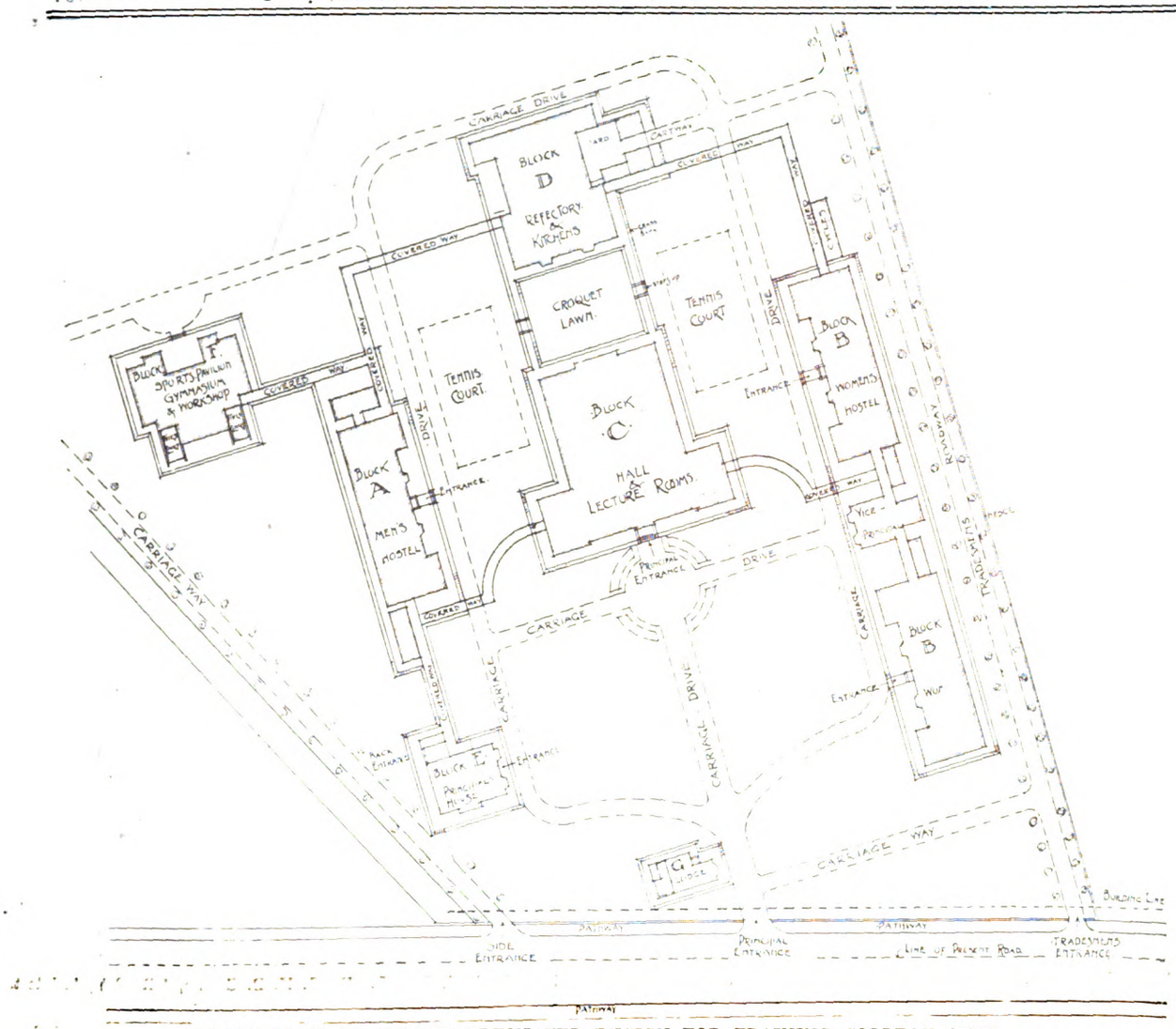
WILLIAM H. THORP, F.R.I.B.A., Architect.

masonry being formed of Cyclopean worked stones, which in some cases are nearly 20 feet high, weighing many tons. Indeed, we are at once struck on observing the walls of this fortress, as well as those of others of the Inca buildings, with the remarkable character of the masonry, not so much by the size of the monoliths as by what is either a singular disregard of uniformity and alignment in the joints, or is a curious, purposeful variation of these. Thus we see that each stone is an individual, not a counterpart; a polygon, not a cube. In many cases the stones are cut out to fit each other in a way such as must have involved much labour, especially when it is recollected that the Inca masons probably had no means of laying out angles; so that presumably the stones were made to fit each other by the laborious method of constantly removing and replacing. It has occurred to me, although I may be wrong, that this giving of an individuality of form to each stone was a nice and purposeful art, or carried out for some now unknown reason. Notwithstanding this diversity of surface, the contact between the stones is generally so perfect that a knife-blade cannot be inserted; and there is no mortar. In some of the temples—it is stated by the Inca historian, Garcilaso—gold and silver was used as a bedding material for the stones. Whatever may have been the reason for this lack of uniformity in the Inca masonry, it is singularly beautiful and unique, and the walls have well resisted the ravages of time and the elements. In the streets of Cuzco some well-preserved examples of Inca walls form part of modern buildings, as before mentioned. A good example is the wall which was the base of the Palace of Huayna Capac, one of the later Inca emperors. Here massive stones are encountered, polygonal in form, fitting perfectly into each other. One of these, it may be observed, is a twelve-sided polygon. This wall forms part of an Inca street which is used to-day. In the city of Cuzco there are various other buildings, notably the remains of what was the Temple of the Sun. Overlooking the valley we have also the singular steps or terraces, cut out of the living rock, which is termed "the seat of the Inca," and it is stated that the Inca emperor took his seat here to watch the construction of the great fortress.

At about a day's ride from Cuzco we reach the head of the Yucay Valley and see its base 4,000 feet below. Upon the slope of this remarkable valley—it is one of those which drain into the affluents of the Amazon—the ruins of another remarkable fortress are encountered—that of Ollantaytambo. This also consists of great terraces of Cyclopean masonry. In this structure a common feature of Inca architecture—the series of niches in the walls with their characteristic trapezoidal form—give a unique and handsome effect. No style of building could accord so well with its environment as these massive structures of the Incas. Possibly the builders were influenced by the mighty mountains which overhang their valleys, as I have before averred, and strove to adapt their work to the stupendous Andine architecture on every hand, fashioned by the "Unknown God" to whom their temples were raised.

Another remarkable group of ruins in the same region is that of Intihuatana and Pisac. The latter is another imposing fortress upon the summit of the mountains, a remarkable situation with an extensive view of the surrounding cañons. But this fortress of Pisac had its own sacred purpose. It enclosed—and still encloses—the temple wherein stands the famous astronomical stone or pillar of Intihuatana.

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BLOCK PLAN OF SECOND PREMIATED DESIGN FOR TRAINING COLLEGE, HULL.
By WILLIAM H. THORP, F.R.I.B.A., Architect.

This word means in the Quechua tongue, "the seat or throne of the sun," or the place "where the sun's rays are collected." The pillar was, in fact, the instrument by which the Inca astronomer-priests determined the solstices. The column, now broken but still existing, is worked out of the solid rock. It is enclosed by a circular tower, and in this the priests observed the shadow of the column upon an east and west line inscribed upon a circle which surrounded it. When the day approached great feasts were celebrated, and a golden stool was placed upon the shaft so that "Inti," the sun, might "sit down" upon it for the solstice. There were others of these astronomical pillars throughout Peru and Ecuador, but they were generally destroyed by the Spanish priests after the conquest, as "things of the devil." The fortress and buildings surrounding the column-chamber are beautifully executed—stone-built corridors, halls, and chambers; whilst the whole place, surrounded by beetling precipices and protected by revetments of granite masonry, is impregnable. In the rock walls of the valley are seen ancient tombs in absolutely inaccessible positions to-day. These great fortresses commanded the valleys leading down to the region of the Amazonian forests below, and were to protect the empire from the incursions of the savage tribes dwelling there. Even to-day the forest region beyond the Andes is a savage unexplored territory in great part, inhabited by bands of Indians, although the business of rubber gathering is opening it up to some extent.

(To be concluded.)

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 24, MR. ARTHUR C. BLOMFIELD, M.A., F.R.I.B.A.

MR. ARTHUR BLOMFIELD, with his brother, Mr. CHARLES J. BLOMFIELD, not only carries on the practice founded by their father, Sir ARTHUR BLOMFIELD, but has made his mark in particular as a designer of banking premises in the City of London, which are worthily representative of English architecture at the present time.

NO. 25, MR. PAUL OGDEN, F.R.I.B.A.

MR. PAUL OGDEN is one of the prominent architects of Manchester, and has recently filled the office of President of the Manchester Society of Architects.

DESIGN FOR A CHURCH IN EAST ANGLIA.

THE drawing from which our illustration is taken was exhibited in the Royal Academy this year, and is the work of a young architect who has not yet attained his majority, Mr. WILLIAM H. COATE.

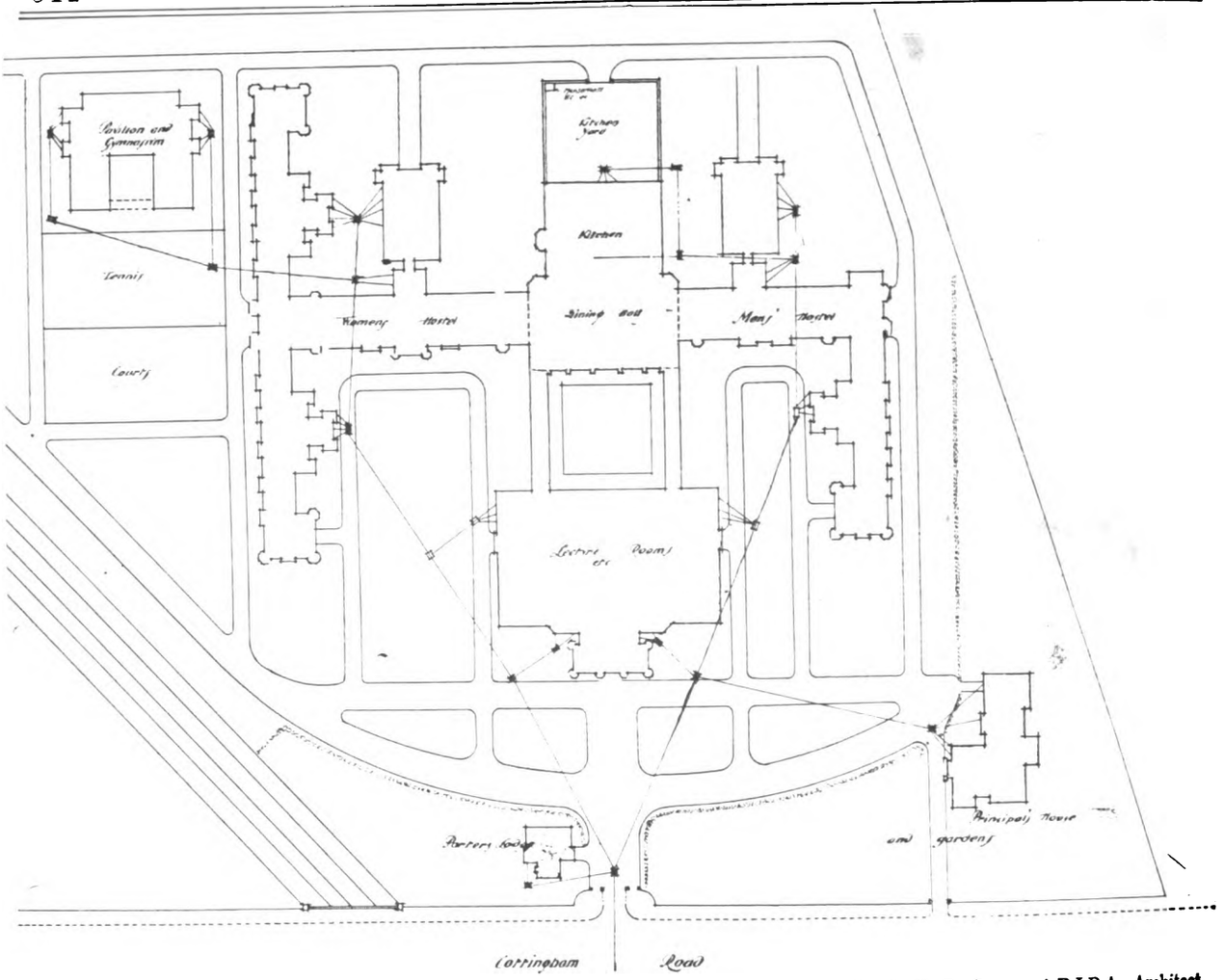
A DESIGN FOR GLAMORGAN COUNTY OFFICES.

THIS drawing also was exhibited in this year's Royal Academy, and represents Messrs. GARRATT & SIMISTER'S unsuccessful competition design for the new offices at Cardiff for the Glamorgan County Council.

NEW OFFICES FOR THE SCOTTISH UNION AND NATIONAL INSURANCE COMPANY, LEEDS.

THE building erected for the above company is constructed with KAHN'S system of reinforced concrete for the walls and floors, the former being faced with keyed terra-cotta blocks having a glazed face. These blocks are made by the Leeds Fireclay Company at their works at Burmantofts, and are known by the trade name of "Marmo." Messrs. W. NICHOLSON & SON, of Leeds, were the contractors for the whole of the works. The heating is on the cable system, and was installed by the Leeds Marble Company. The electric lift serving all floors was provided by A. & P. STEVENS, Glasgow. Mr. THEWLIS, of Leeds, modelled the terra-cotta and plaster enrichments. The insurance company occupy the ground floor, above a well-lighted basement which is let, as are all the upper floors, for offices. The architects of the building are Messrs. PERKIN & BUDMER.

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BLOCK PLAN OF THIRD PREMIATED DESIGN FOR TRAINING COLLEGE, HULL. By G. H. B. GOULD, A.R.I.B.A., Architect.

NORTHERN ASSURANCE COMPANY'S OFFICES, MOORGATE STREET, E.C.

THIS new building has frontages of 76 feet to Coleman Street, to Lothbury of 104 feet, and to Moorgate Street of 80 feet. The site is freehold belonging to the trustees. The foundations are at a depth of about 29 feet below the existing pavement level. Two basements have been constructed. There is a spacious ground floor and five floors above, besides a sixth floor for the housekeeper's quarters. The elevations are designed in a bold Classic style, a large Ionic order being used above the ground floor, with columns 30 feet high supporting the main cornice. The whole of the exterior is faced with white Aberdeen granite from the Kemnay quarries, finished with a fine tooled face. Some of the blocks weighed seven tons. One of the requisitions of the freeholders was that the building should be so designed that it could be divided into three separate buildings. There are therefore three staircases—one entered from Lothbury, another from Moorgate Street, and one for the exclusive use of the Northern Assurance Company. The board room, committee rooms, luncheon room and general manager's room are situated on the fourth floor, and are panelled and finished in wainscot in the Georgian style. Electric passenger lifts (of which there are four) have been provided adjacent to each staircase by the Otis Elevator Company, Ltd. The building is fireproof throughout and of the most solid construction. The steel stanchions and girders, supplied and fixed by Messrs. LINDSAY, NEAL & Co., of Paddington, are encased with fireproof material. The floors and internal partitions are formed of frazzi. The work of erection was commenced in November 1907. The contract (amounting to over 100,000*l.*) has been carried out by Messrs. TROLLOPE & SONS and COLLS & SONS, LTD. The architects appointed to design and superintend the construction of the building were Mr. E. A. GRUNING, F.R.I.B.A., F.S.I., and Mr. E. W. MOUNTFORD, F.R.I.B.A. But both these gentlemen died during the progress of the work, Mr. MOUNTFORD on February 7, and Mr. GRUNING on December 29 of last year. On the death of Mr. MOUNTFORD his place was taken by his partner, Mr. F. DARE CLAPHAM, A.R.I.B.A.; and since the death of Mr. GRUNING, Mr. H. ALEXR. PELLY, F.R.I.B.A. (who succeeds to Mr. GRUNING's practice) continued to advise the company. Among the contractors who have not been already mentioned are The Well Fire and Foundry Co., Ltd., 33 Dover Street, W.; Rust's Vitreous Mosaic Co.; Val de Travers Asphalte Paving Co., Ltd.; The Turk System Drying Co.; Mr. J. GIBBONS; The British Challenge Glazing Co.; and the Buttermere Slate Co., of Keswick.

SECOND PREMIATED DESIGN FOR TRAINING COLLEGE, HULL.

THIS design was criticised at some length in the review of the competition for the Training College, Hull, included in our issue of November 5. We give, in the text, the plans of Mr. THORP's design for Unit C, which we considered especially excellent.

THIRD PREMIATED DESIGN FOR TRAINING COLLEGE, HULL.

THE guiding idea of this plan was that the hostels are better under the same roof as the dining-hall and kitchen so long as the departments are kept distinct and disconnected; and in this plan the dining-hall effectively separates the men's and women's hostels from each other and from the kitchens. The other main desideratum was that all corridors should be well lighted and ventilated, and with this express object it was decided to avoid the use of corridors flanked on either side with rooms, but this, of course, made the plan of a more extended character. All living and sleeping rooms receive sunlight from the south, west, or east, while the sick-rooms are lighted from the south only. The class-rooms are ranged round a lofty south-lighted assembly hall, and form a separate block nearer Cottingham Road, being reached from the main building by short covered ways. The elevations are of a Tudor character, and would have been carried out in brick and tile. The whole scheme was estimated to cost 36,207*l.* The author was Mr. G. H. B. GOULD, A.R.I.B.A.

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SECOND PREMIATED DESIGN FOR TRAINING COLLEGE, HULL.

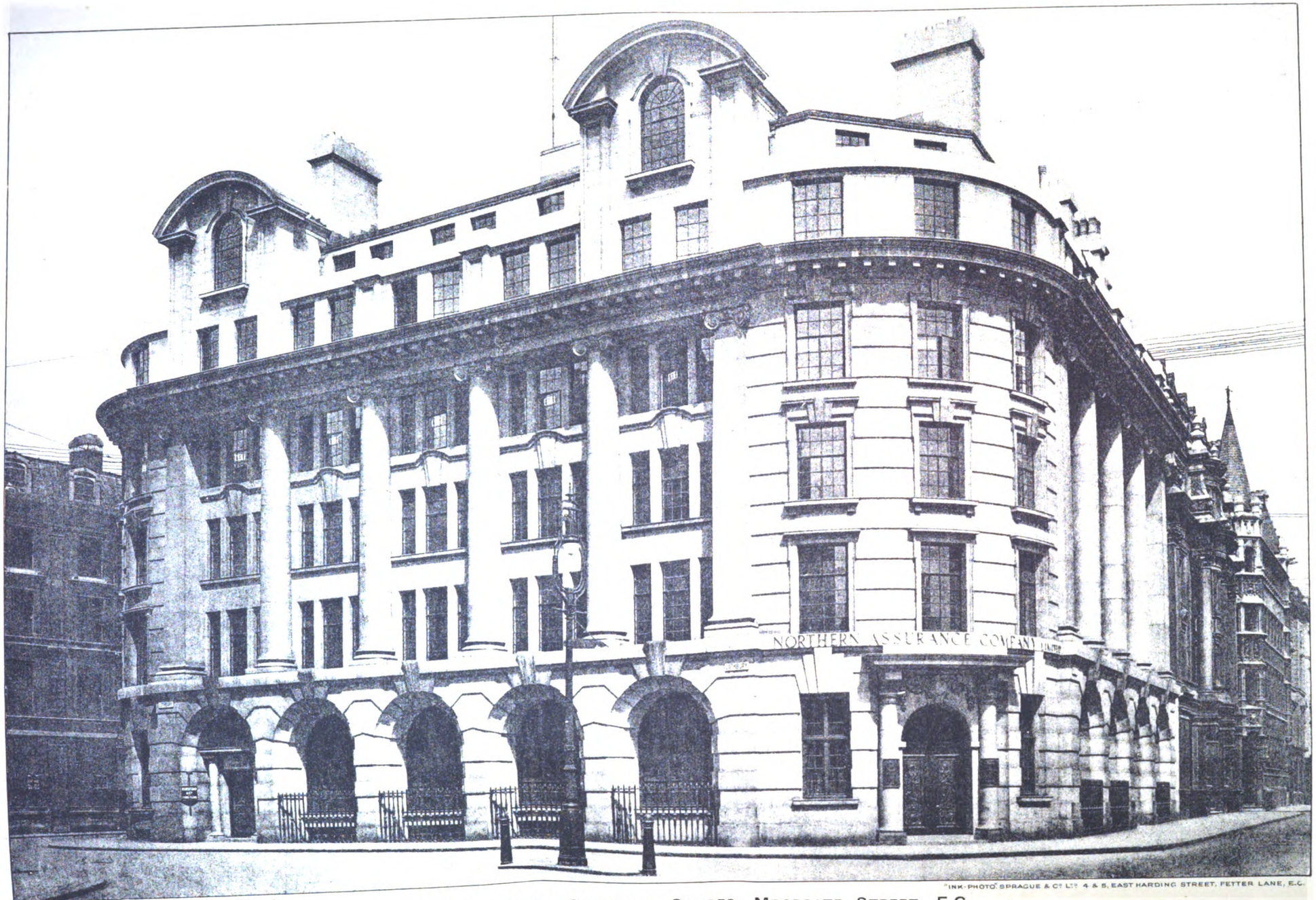
WILLIAM H THORP, F.R.I.B.A., Architect.

PHOTO-LITHO SPRAGUE & C. L. 445, EAST HARDING STREET, FETTER LANE E.C.

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NORTHERN ASSURANCE COMPANY'S OFFICES, MOORGATE STREET, E.C.

The late E. A. GRUNING, F.R.I.B.A., and
The late E. W. MOUNTFORD, F.R.I.B.A. } Joint Architects.

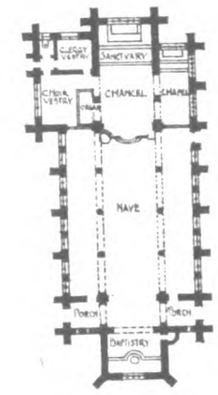
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Design for a Church in East Anglia.

William H. Coate, Architect, Lyton.



The Architect, Nov. 26th 1909.

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LIVING ARCHITECTS. No. 24: MR. ARTHUR C. BLOMFIELD, M.A., F.R.I.B.A.

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Feb 26th 1909.

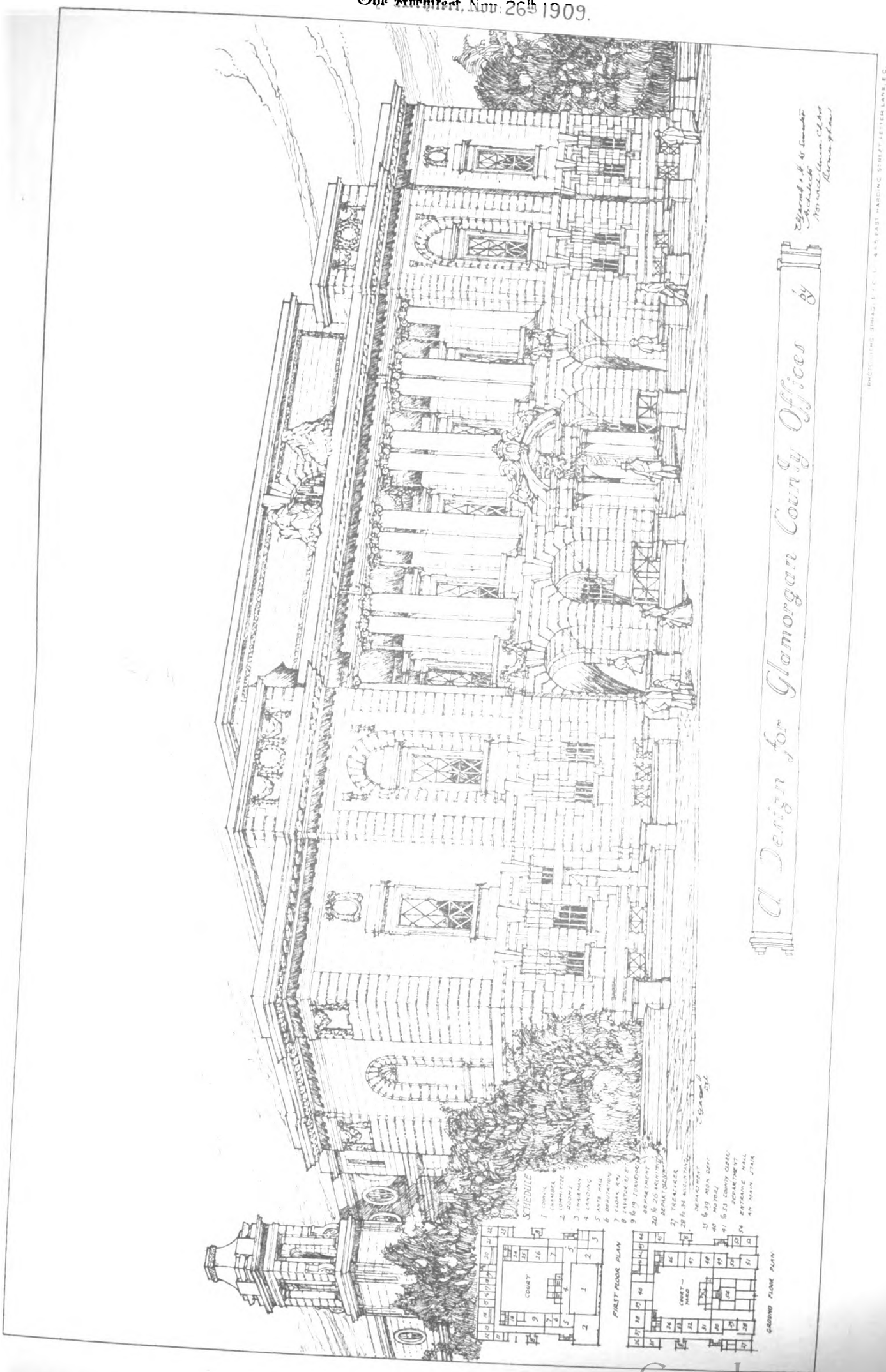


LIVING ARCHITECTS. No. 25: MR. PAUL OGDEN, F.R.I.B.A.

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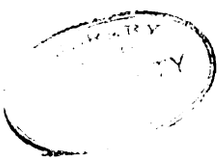


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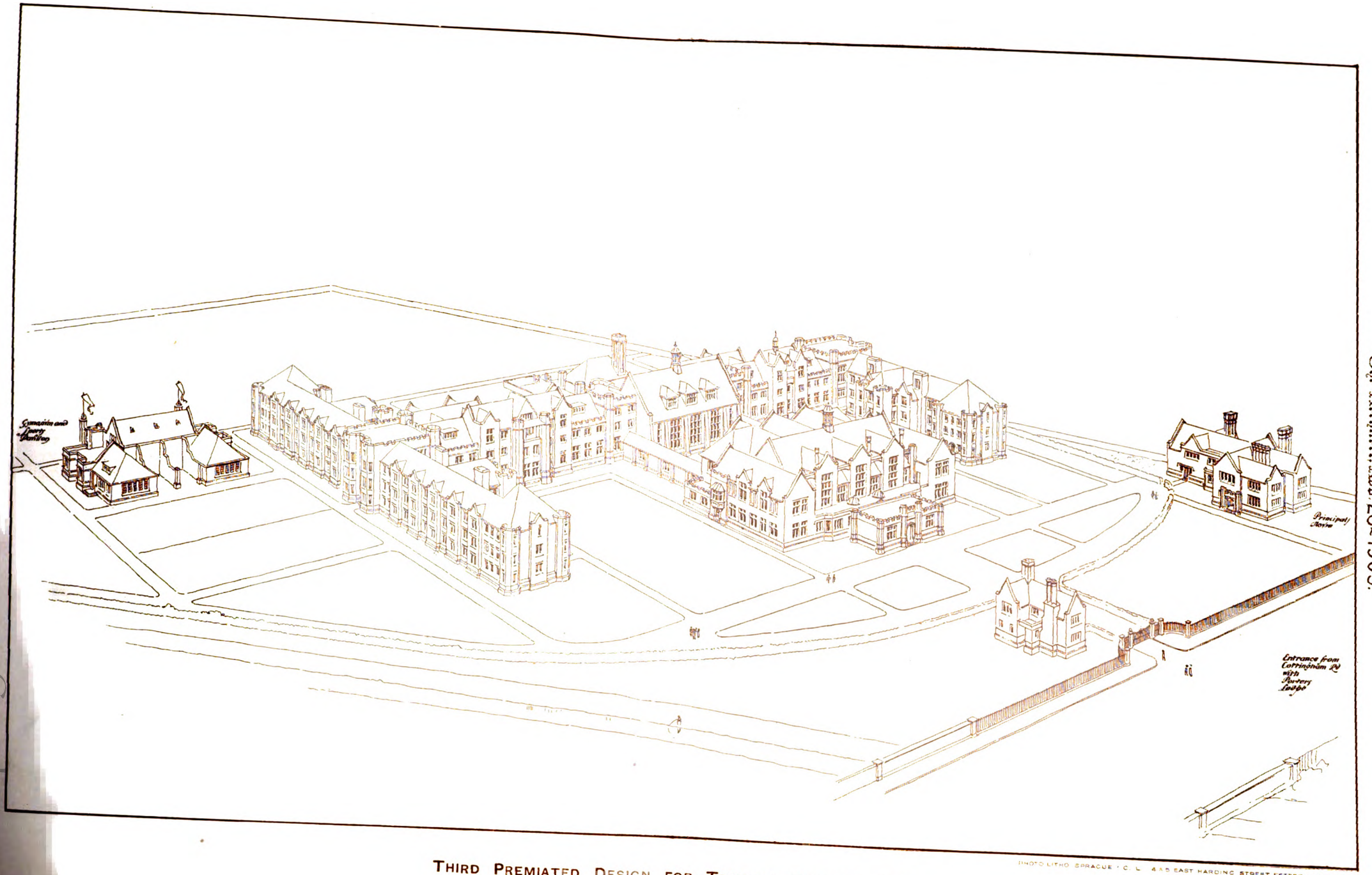
NEW OFFICES FOR THE SCOTTISH UNION AND NATIONAL INSURANCE CO., LEEDS.

Messrs. PERKIN & BULMER, Architects.

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THIRD PREMIATED DESIGN FOR TRAINING COLLEGE, HULL.

G. H. B. GOULD, A.R.I.B.A., Architect.

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THE OLD PALACE, RICHMOND, SURREY.—COURT AND GATEWAY

RICHMOND PALACE AND ITS FOUNDER.*

THE derivation of the names of the places we visit is frequently the cause of much learned dissertation, but Richmond is accounted for at once, and it was so named by Henry VII., whose title before he succeeded to the throne was Earl of Richmond (Yorkshire).

According to Mrs. Arthur Bell's charming little book on Richmond, there was a royal residence there, or thereabouts, long before his time, but it was called Sheen. Henry I. was there shortly before his death. Edward I. also resided there occasionally, but it was not until the time of Edward III. that it assumed much importance; he greatly enlarged and beautified the house and spent much time here with his queen. It was here he received the news of the death of his son Edward the Black Prince, and he himself died here a year later. Richard II. and his first queen stayed here, and the poet Chaucer, who also was somewhat of an architect, was employed by them to superintend some alterations to the Palace. Henry V. and his son Henry VI. both used the place as a residence from time to time. The widowed queen of Edward IV. came here after her sons were taken from her, and stayed till she was dispossessed by her son-in-law Henry VII., who, after an extensive fire, practically rebuilt the place, with great additions and improvements, and gave it its name of Richmond Palace. Henry was constantly at Richmond, and it was here that the contracts of marriage were signed between his son Arthur and Katherine of Aragon, and his daughter Margaret and James IV. of Scotland. Arthur died about a year after his marriage, and Katherine then came and lived at Richmond. She was kept in great penury, could not pay her servants' wages, and had to go short of food and clothing; only half her dowry had been paid, and the question then arose with Henry whether to give up the half he had, or get the other half. He ultimately decided she should marry his second son, and a dispensation was obtained from the Pope, and they were betrothed, much against the wish of Katherine. Henry came to Richmond in his last illness, and died there in 1509. He was succeeded by his son Henry, who shortly afterwards carried out his marriage with Katherine, he being eighteen and she twenty-four. Their first child, a son, was born at Richmond Palace, but died soon afterwards. There were other children, but none lived except the Princess Mary. Henry was only occasionally here afterwards, though a mound is shown in the grounds of Pembroke Lodge, in the Park, where tradition says he watched for the rocket which was to notify the execution of his second queen, Anne Boleyn. He was privately married to Jane Seymour immediately afterwards, and they spent their Christmas at Richmond; but she died the following year, after giving birth to the future Edward VI. The next queen, Anne of Cleves, was married and divorced very quickly; Henry had an aversion for her from the first, and a divorce was arranged on the ground of a supposed pre-contract between her and the Marquis of Lorraine when both were children. She was allowed Richmond Palace as a residence, and lived here until she was turned out by the Protector Somerset on the death of Henry VIII. The King visited her here several times, and they seem to have been very good friends, though he could not like her as a wife.

He was succeeded by his son Edward VI., who resided at Richmond for a time, and whilst here witnessed the marriage of Robert Dudley, afterwards Earl of Leicester, and Amy Robsart.

Queen Mary spent her honeymoon at Richmond, but later on had her sister, the Princess Elizabeth, kept here as a prisoner, though she afterwards received her as a visitor shortly before her own death.

Richmond Palace was a favourite place of residence with Elizabeth, and here she held Councils, received Ministers, and carried on flirtations with Leicester and other favourites. It was here she signed the death-warrant of Mary Queen of Scots, though after the execution she said her Secretary was told the warrant was not to be acted on. It was here she died in 1603.

James I. never troubled Richmond very much, but he gave it to his son, Henry Prince of Wales, who spent large sums on it. Charles I. resided here for a time, and he it was who enclosed Richmond Park, although it met with great opposition. His children were prisoners here for a time during the Commonwealth. Soon after the execution of Charles I. commissioners were sent to survey and report on the Palace, and it is from their report that we have some conception of what the Palace was like. They describe it as a very large and beautiful range of turretted buildings, including a hall 100 feet long by 40 feet broad, a chapel 96 feet long by 30 feet broad, a large library well stocked with valuable books, a beautiful gallery 100 feet long, and extensive buildings with numerous rooms, stables, &c.

* A paper read at a meeting of the Upper Norwood Atheræum by Mr. George Thatcher.

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In 1650 the Palace was sold, but on the Restoration again became royal property, and was assigned as a residence to the widowed queen of Charles I.

The two sons of James II. by his first marriage died here as children, while under the charge of their governess.

After this a great deal of the Palace seems to have been pulled down from time to time, and it was not until George I. allowed his eldest son and wife to reside here that it was used by royalty again. They complained that there was not room enough for their attendants, and the houses on the Green, still called Maids of Honour Row, were built to accommodate them.

Queen Caroline, wife of George II., lived here occasionally, and it was here that Sir Walter Scott laid the scene of her memorable interview with Jeanie Deans. Since her time it has never again been inhabited by royalty.

The story of Henry VII., who may be called the founder of Richmond, reads more like a romance than mere history. His grandfather, Owen Tudor, was a handsome young Welshman, and fought in the rank and file at the battle of Agincourt. Henry V. made him one of his own squires for his bravery on that occasion. After the death of Henry, Owen was promoted to the office of Clerk of the Wardrobe to the widowed Queen Katherine, and ultimately they were secretly married. Their eldest son was Edmund Tudor, and this gentleman was created Earl of Richmond by Henry VI., his half-brother, and married Margaret Beaufort, the only child and heiress of John Beaufort, Duke of Somerset. They had one son, the future Henry VII. Henry's father died when he was only five months old, and his mother was maid, wife, mother and widow before she was fifteen. Henry's title to the throne, if indeed such a pretension can be dignified by such a term as title, is shadowy to a degree until his marriage; and to understand it, and really to understand the reason for the Wars of the Roses, we must go back to Henry III. and his sons.

Henry III. had two sons, Edward, who succeeded him, and Edmund Crouchback, Duke of Lancaster. Edward I. was succeeded by his son Edward II., and he by his son Edward III. The latter king had seven sons, the eldest being Edward the Black Prince; the second, William of Hatfield, who died in infancy; the third, Lionel, Duke of Clarence; the fourth, John of Gaunt, who by marriage with the great grand-daughter of Edmund Crouchback, son of Henry III., became Duke of Lancaster; the fifth, Edmund of Langley, Duke of York; the sixth, Thomas of Woodstock, Duke of Gloucester; and the seventh, William of Windsor.

Richard II., the only surviving son of the Black Prince, died without issue, having first been deposed by Henry Bolingbroke, afterwards Henry IV., who was the eldest son of John of Gaunt, fourth son of Edward III.; but there was then a daughter living of Lionel, the third son of Edward III., who had married Edmund Mortimer, Earl of March; but she was a widow, and although she had sons and daughters, the eldest was only seven years old, and their rights seem to have been absolutely passed over. One of her grand-daughters, however, married one of the great grandsons of Edmund Langley, Duke of York, the fifth son of Edward III., and it was through her that the Dukes of York claimed in priority to the descendants of John of Gaunt. On the other hand, to lend colour to his claim, when he caused the deposition of his second cousin, Richard, Henry IV. put about the story that Edmund Crouchback was really the eldest son of Henry III., but as he was deformed his brother Edward had been put forward as the eldest, and Henry said he was entitled to the Crown, as son of his mother, Blanche, the last lineal descendant of Edmund Crouchback.

The rival claims of these two houses involved the country in civil war for thirty years (1455-85), with varying fortune, and as this war went on it was conducted with increasing ferocity on both sides. Every success was followed by attainder and confiscation of the estates of the defeated party, and the execution of such as were taken. Many who escaped death were reduced to abject poverty; for instance, we read of Hugh Holland, Duke of Exeter, barefooted and in rags, begging in Flanders from door to door, although himself of royal descent and married to a sister of Edward IV. The Countess of Oxford supported herself and her children by her needle for fifteen years during the time her husband was imprisoned by the Yorkists. It is true that attainders were reversed and estates restored when fortunes changed, but the families of many were practically extinguished, and very few of our nobility can show an unbroken title earlier than the close of the fifteenth century.

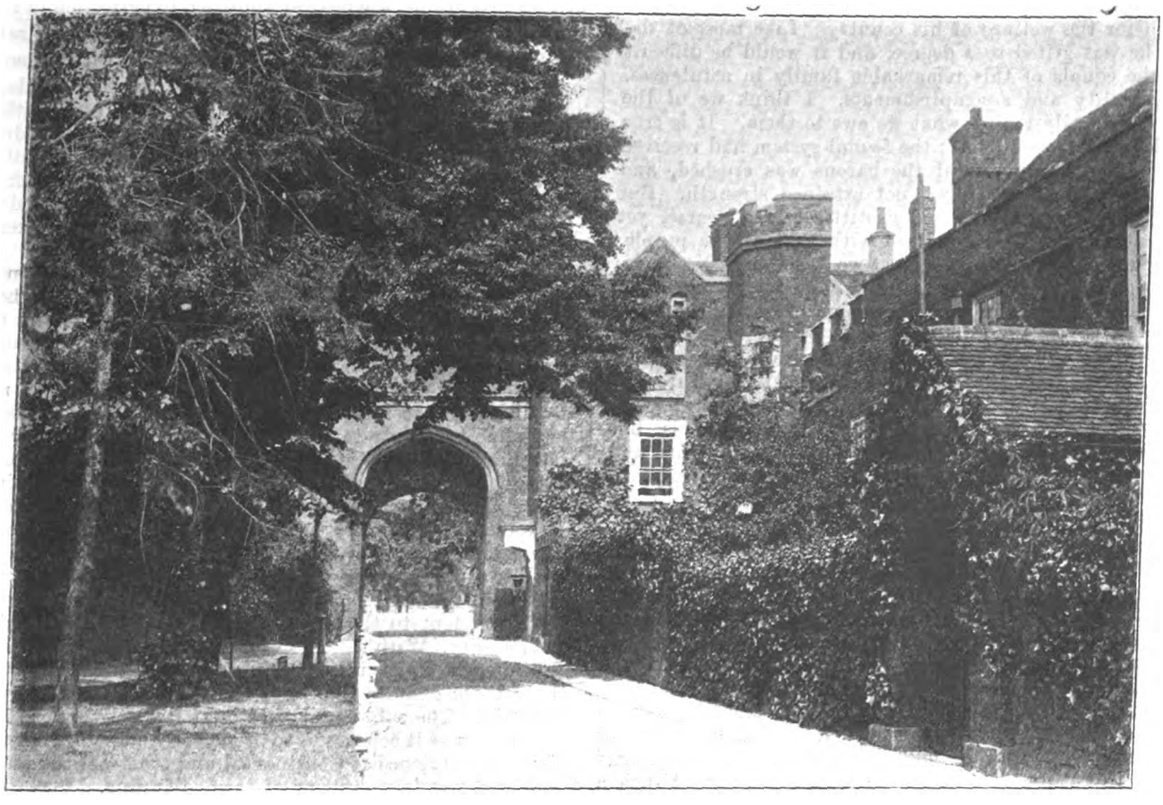
The death of Edward IV. and his infant sons, and the usurpation of Richard III. and his tyrannical rule, brought matters to a climax, and at the instigation of the Duke of Buckingham (himself of royal descent) and Morton, then Bishop of Ely, and afterwards Archbishop of Canterbury, the wiser heads of both parties met with a view to some course which should ensure peace by uniting both; and it was decided to invite Henry, Earl of Richmond, to be king, provided he would marry the eldest daughter of Edward IV., and thus unite in their children the claims of both houses. He accepted the invitation, and landed at Milford Haven, and was met at Bosworth by Richard III. and his army. The battle was decided by the defection of the Stanleys and their retainers, who had been forced to join with Richard; at a critical moment of the battle they changed sides, and Richard was defeated and killed. Henry's life is said to have been saved by Sir William Stanley, and Richard's crown was placed by Stanley upon Henry's head.

Henry VII.'s claim was as the representative of his mother, Margaret Beaufort (who was still living at the time); she was also descended from John of Gaunt, through her ancestor John Beaufort, Earl of Somerset, who was an illegitimate son of John of Gaunt by his mistress, Catherine Swinford. It is true the children of this connection were afterwards made legitimate by Act of Parliament, but it was provided in the patent that they should be incapable of inheriting the throne. To say nothing of this obstacle, there was a large number of persons entitled to inherit before Henry. There were, in the first place, the five daughters of Edward IV.; then the descendants of Edward's brother, the Duke of Clarence; then the De la Poles, the descendants of his sister Elizabeth; then with regard to the House of Lancaster itself there were the descendants of the second marriage of John of Gaunt. Henry got over the difficulty by Act of Parliament confirming his title as king, which, however, is prudently silent as to his right to it, and he made it good for his descendants by marrying Elizabeth, the eldest daughter and heiress of Edward IV. The Pope's dispensation had to be obtained to the marriage because Henry and Elizabeth were said to be within the prohibited degrees, being third cousins once removed, their common ancestor being Thomas Holland, Earl of Kent. A strained interpretation seems to have been put on the canon which prohibited marriages within the seventh degree, and the degrees seem to have been counted by generations and not by relationship, as is now the practice in the Roman Church. The real reason for the dispensation seems to have been to obtain the Pope's official recognition of Henry's title as king, and the draft of the dispensation was sent back to Rome three times before it was so worded as to be acceptable to the king, and the marriage had been celebrated some time before it was finally settled and signed. Bacon says Henry was not an affectionate husband; at all events he was not a liberal one, for although his queen brought him a large dowry as Countess of Clare, yet her accounts show very few items for new clothes, but there are plenty for turning and mending old ones.

Almost one of the first acts of the new king was to make a recurrence of the civil war impossible. The nobles were ordered to disband their retainers, and not to maintain more than a certain retinue; and so severely was this enforced that it is related that when the king was on a visit to the Earl of Oxford a steady and consistent supporter of the House of Lancaster, he observed that he was attended by a large body of armed men, and on his departure said to him, "I thank you for your good cheer, my lord, but I may not endure to have my laws broken in my sight; my attorney must speak with you." The interview took place, and it cost the Earl 10,000*l.*, equivalent to about 100,000*l.* at the present day. While he made the barons put down their retainers, he instituted a bodyguard for himself which he called the Yeomen of the Guard, and this body is the earliest established existing corps in this country, and the only one retaining its original uniform.

In a paper such as this it is impossible to give more than a very brief sketch of the events of his reign. Two rebellions took place in support of pretenders to the throne—the first on behalf of a lad named Lambert Simnel, who was put forward as the little Duke of York supposed to have been murdered in the Tower, and afterwards as the Earl of Warwick, son of the late Duke of Clarence, who was actually a prisoner in the Tower at the time. This was suppressed, and Henry granted a free pardon to all who submitted except some of the leaders, one or two of whom he executed, and the rest he let off with heavy fines. The other rebellion

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THE OLD PALACE, RICHMOND, SURREY.—WARDROBE COURT.

was of a more formidable character and occurred some years later, and lasted for more than seven years before it was suppressed. The pretender in this case was a young fellow named Perkin Warbeck, and also claimed to be the Duke of York. He very much resembled the late King Edward IV., and the probability is that he was really an illegitimate son of his; very many believed in him until his armies were finally defeated and he himself executed at Tyburn. The persons of inferior degree were again pardoned on submission, but the punishments of those of superior rank who had taken part were far more severe. Among those accused was Sir William Stanley, the king's Chamberlain. He was the brother of Henry's stepfather, had fought for the king at Bosworth, where he is said to have saved his life and placed the crown on his head. The only thing which seems to have been proved against him was that he had said if he were sure the young man were King Edward's son he would not bear arms against him. This was tortured into an expression of treason, and he was executed.

There was great doubt about the deaths of the young Princes, and it has never been satisfactorily cleared up. Henry had an inquiry made, and four persons were implicated, only two of whom were then living. The story was that Sir John Tirrell had temporary command of the Tower; that two soldiers, Dighton and Forrest, were let in, and smothered the children with pillows; that the bodies were buried by the priest of the Tower under some stairs, but that he afterwards removed them and buried them elsewhere; but he was dead, and the survivors did not know where he had put them, and the bodies could not be found.

Henry has been much blamed for the execution of Stanley, but there is no doubt that his severity in the case of such tried and proved friends as Oxford and Stanley was a strong deterrent to those who had no such claim.

In the third year of his reign Henry got an Act passed reviving and giving additional power and importance to the Court of Star Chamber. This Court can be traced as far back as the time of Edward III., or even earlier; it was really a committee of the King's Privy Council, and sat first wherever the king happened to be, but afterwards permanently at Westminster in a room with a painted ceiling representing the heavens at night-time with the stars. It professed to be instituted so that justice might be obtained by all king's subjects, which was sometimes impossible at the assizes and local courts owing to judges and juries and sheriffs being overawed by the barons and their retainers.

The Selden Society have recently issued a most interesting report of some of the Star Chamber cases, 1477-1509. The Act is 3 Henry VII., Chapter 1, an Act giving the Court of Star Chamber authority to punish divers misdemeanours. Bacon says the Court of Star Chamber (of which, by the way, he had been a member) was "one of the sagest and noblest institutions in this kingdom. The committees consisted of four kinds of persons—councillors, peers, prelates and chief judges. There were four kinds of causes—forces, frauds, crimes various of stellionate, and the inchoations or middle acts towards crimes capital or heinous not actually committed or perpetrated." It will be noticed that the mischief was that it not only dealt with crimes committed, but also with those intended or supposed to be intended, and was itself the judge whether there was an intention. Advantage was taken to make money out of this by the king, and his agents, Empson and Dudley, brought wholesale charges of treason or intended treason against all sorts of persons; capital punishment was seldom inflicted, but there were numerous and heavy fines, all of which went to the king. The sittings were nearly always in secret, and there was no jury and no appeal. From this and forfeitures on attainders the king became the most wealthy monarch of his time, and at his death his property in present money was about eighteen millions at least.

He died at Richmond on April 21, 1509, in the twenty-fourth year of his reign and the fifty-second year of his age.

Bacon's description of the king is:—"He was sad, serious and full of thoughts, full of apprehensions and suspicions, affable and fair spoken, rather studious than learned. There are no news of his pleasures. He had a comely person, a little above just stature, well and straight limbed, but slender; countenance reverend and a little like a Churchman. He had the fortune of a true Christian as well as a great king, in living exercised and in dying repentant."

His great fault seems to have been a love of money, and he descended to mean and petty tricks and deceits for the sake of it; but he was liberal to the Church and the poor, and was a great patron of the fine arts, especially architecture. He encouraged commerce and discovery, and was our first monarch to promote colonisation; he fitted out at his own cost an expedition by Sebastian Cabot, which discovered and took possession of Newfoundland, the first English colony. He was not a bloodthirsty man, and would always rather have peace than war; yet he proved himself a good and brave soldier on occasion, and tempered his successes with mercy

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to the vanquished. He was one of our greatest kings, and did much for the welfare of his country. Like most of the Tudors, he was gifted to a degree, and it would be difficult to find the equals of this remarkable family in astuteness, courage, ability and accomplishments. I think we of the present day hardly realise what we owe to them. It is true they ruled almost as despots; the feudal system had received its death-blow, the power of the barons was crushed, and that of the Commons had yet not attained strength. But although they were selfish and egotistical to a degree, yet they identified their own welfare with that of the people, and recognised that the two must go together. No corresponding period of English history shows such progress as was made in their time except the reign of our late beloved Queen. In agriculture, in commerce, in manufacture, art and literature the improvement was by leaps and bounds. The country had been largely pastoral, but agriculture was widely introduced; the commerce had been mainly export of raw material and the import of manufactured goods, but now instead of exporting raw wool it was spun into yarn and woven into cloth. Linen and silk weaving were introduced, and work was found for all who chose to undertake it. Commerce led to the improvement of ships and their larger use, to the search for and discovery of new countries and to their colonisation, to the necessity of so equipping and manning vessels as to enable them to resist the attacks of pirates and hostile fleets, and it fostered the development of some of the most skilful and daring seamen the world has ever seen, so that England at the close of the time of the Tudors was queen of the seas, as she has ever since remained. The close of the wars rendered a better style of domestic architecture available, and houses were built which are still the pride of our countryside. But in nothing was the advance greater than in literature, and no age or country can show such a brilliant constellation of genius as Shakespeare, Spenser, Johnson, Sidney, Raleigh, Moore, Greville, Massinger, Marlowe and others. Printing had indeed been introduced in the previous dynasty, but had met with appreciation by only a few, and by opposition from others; it was now fostered and encouraged, and its results were soon shown in the higher education of the upper and middle classes, and the consequent softer and more refined manners. Last, but not least, it is to the Tudors that we owe our printed Bible and the beginning of civil and religious liberty.

(The illustrations are from photographs by Mr. W. S. Stuart, of Richmond.)

TOWN PLANNING SYSTEMS.

At a meeting of the Surveyors' Institution on Monday evening last Mr. A. R. Stenning (President) in the chair, Mr. W. R. Davidge read a paper, illustrated by lantern views and plans, on "Town Planning Systems."

Town planning, he said, although so much in the air at present, is no new thing. It cannot claim to be an invention of the twentieth century or to be a new and startling discovery of the present generation, nor is it even due to the abilities of our immediate forerunners. Town planning has been practised, whether under that name or not, for many centuries. Opportunities of constructing a complete town at once, or from a fixed plan, have, however, been comparatively few, and even those opportunities have not, perhaps, always been utilised to the fullest extent.

In the older cities of the world an occasional disastrous conflagration, or the destruction of a portion of the city at the hands of friends or foes, has sometimes prepared the way for a grand and general scheme of reconstruction, and many perhaps of the greatest and most famed of the cities of Europe owe their present magnificence in no small degree to the extent of their past calamities. London owes something to the Great Fire, and might have owed much more had the rebuilding been carried out in the way Wren and others would have had it. It is instructive even now to compare the schemes proposed by John Evelyn and Sir Christopher Wren for the rebuilding of London. Vienna, Paris and Berlin are all indebted to the sacrifices and often to the sufferings of the past, and it is possible that the development of these cities would not have been so complete or so satisfactory had they been constructed at their earliest inception on the lines of some general plan instead of by the troublous and slow development, piece by piece, they have been forced to follow.

Many of the newer cities in America and the Colonies, and also in some cases on the Continent of Europe as well as in the East and Far East, have been completely planned from their very commencement, and here one would think, with all conditions favourable, the nearest approach to perfection in town planning should be reached. In many cases indeed the result is the construction of a fine and spacious town, with abundant open spaces and streets of ample width. The very regularity of such a city may however become almost painful, with its monotonously straight and never-ending lines of buildings, with street after street all apparently the same and all apparently endless. The pedestrian in search of the other end of a street wearies from physical and mental fatigue, and still that painful unattainable end seems as far off as when he started.

Partial town planning, such as that involved in the planning of suburbs and the general lines on which the development and extension of an already existing town shall proceed, is of more modern growth, and it is to this modern tendency that our attention is most naturally directed. Garden suburbs and model villages have been introduced in many localities, but so far the initiative in this direction has been left almost entirely to private enterprise. In very few cases has provision been made for anything like a complete or satisfactory scheme of transition from the bustling activities of the central portions of a city, through the districts devoted to trade and residences, out to the fresh beauty of the country beyond.

Town planning, as we know it, is but a development of the best points in existing systems and their adoption to a greater or less extent to the special requirements of the particular community. With the exception perhaps of the newer parts of Edinburgh, Eastbourne, Bath, and one or two smaller towns, very little definite planning has been carried out in Great Britain. The subject however is at last a living one in this country, and it behoves us to profit to the utmost of our powers by the experience of Continental and other nations who have adopted previous systems of town planning.

In Prussia and other parts of Germany, the municipal authorities have for many years been possessed of special powers to enable them to regulate the growth and extension of the towns under their control, and since the passing of the Prussian Street Lines and Building Lines Act, 1875, and even before that date, it has been customary for the town councils to prepare a building plan for the gradual extension of the town and the laying out of the principal new streets within a reasonable radius of the already built up area. With a view to securing healthy conditions, towns are frequently divided into zones or districts, special restrictions as to height and area of buildings being applicable to each zone.

Technical writers in Germany have also turned their attention to the compilation of many excellent works dealing in detail with the preparation of town plans and the study of the examples of the past. Among these may be mentioned the names of Stübben, Baumeister, and Sitte, the latter of whom has made a close study of a very large number of mediæval and other towns whose charm is undeniable, and in particular of the architectural effect produced by judicious planning and grouping of buildings. We all know the delightful fascination of those old world cities, such as Nuremberg and Rothenburg, whose main charm lies perhaps not so much in their scientific planning as in the apparent haphazard grouping of the buildings round some quaint old market place or minster. Even in England our cathedral cities and many of our country villages stand out as possessing in some way a character of their own, often enhanced by some local association or special object of interest, such as a market cross or a village fountain. There is room, much room, in our modern work-a-day world for many such villages, for anything which will give us inspiration and raise our thoughts out of the deadly monotony of the evergrowing and overgrowing suburbs of our modern towns.

One of the causes which has enabled many German towns to develop on a definite plan has been the existence from the earliest times of a large number of reigning princes and grand dukes, who have generally been in close personal touch with their cities and towns, and have thus been in a position continually to plan and improve the principal towns without opposition, the rivalry between neighbouring principalities also being frequently effective in securing magnificent improvements.

The rigidly rectangular plan possesses the advantage of being simple and easily understood, as well as of facilitating setting out and economical building. Direct transit from point to point is, however, from the nature of things impracticable in the majority of cases, though by the aid of a good system of tramways or public vehicles, this defect can be greatly minimised. It may be taken almost as a definite rule, however, that there are in every town or centre, whether new or old, certain well-defined, though possibly irregular

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lines of route or main roads leading from the outskirts into the central portions of the city, and the rectangular alignment of the streets thus frequently resolves itself into a series of separate districts sometimes aligned at varying angles.

The disadvantages to which a strictly rectangular system is subject, if there are no diagonal or other streets in an oblique direction, are plainly apparent, and to remedy this what may be termed the "triangular" system has occasionally been introduced. The object in such cases is usually to provide the shortest possible route between any two points, or in other words to facilitate "short cuts" for traffic; the incidental effects achieved should also be to open out architectural vistas in numerous directions, culminating in many instances in public monuments or monumental buildings. It must not be overlooked, however, that any triangular system of this nature inevitably produces irregular building plots, and also has the effect of concentrating traffic at the principal circuses or squares formed by the intersection of the rectangular or diagonal streets. Anyone remembering for a moment the effect of concentrating five or six streets at the corner of the Mansion House and the Bank of England will appreciate the necessity for ample space to be provided at such intersection if the traffic is not to be hindered unduly. It should be noted, too, that in that instance the principal lines of traffic are really only in two or at most three directions.

The radiating system is perhaps the ideal one, if the "hub" is of sufficient attraction or importance to the community. This system is well illustrated by the laying out of the town of Carlsruhe about 1715—another example of the power of ducal government. More modern examples of town planning than that of Carlsruhe are afforded by the cities of Cologne and Frankfort-on-Main. Both these towns have been fortunate in preserving the space formerly occupied by the encircling walls and fortifications as a ring of public gardens or parks around the inner city, thus obtaining a broad boulevard or ring strasse, something like that which has helped to make Vienna so famous. The development of the outer suburbs also is proceeding on a definite plan in both Cologne and Frankfort. The town plans in these cases have been prepared with a view to the probable requirements of the city for many years to come, and as will be seen from the official plan of Frankfort it will probably be many years before the full advantage of the scheme is obtained; in the meanwhile, however, many thousands of dwellers in the vicinity of the broad boulevards and tree-planted streets are receiving the advantages that come from abundance of open space and fresh air in pleasant surroundings.

But it must not be overlooked that these wide streets are very costly as regards both the land which they occupy and the actual cost of construction. In the majority of cases the whole cost falls upon the owners, and the natural consequence is that in order to recoup this outlay the rents are forced up and as many people as possible crowded into the high tenements or dwellings which are so often a feature of the German towns. Thus, although to outward appearance a fine city may be secured, it does not by any means follow that overcrowding and its attendant evils are removed. The population in the leading German towns varies from about thirty to fifty persons for each house, that of Berlin reaching 52.6 persons per house.

So far we have dealt mainly with straight lines and with regular systems, but probably the cities which really most charm us and which live in our memories long years after we have visited them, are the quaint old-world places, with their irregular streets, their quiet dreamy squares or their bustling market places, withal overshadowed by some grey old minster or some monument of the past; or perhaps our thoughts stray to some quaint cluster of houses nestling round its village green. Wherein lies their undeniable charm? To what extent, and within what limits can their quaintness, their subtle attractions, their very irregularities be imitated at the present day, or rather—is it still possible to catch a little of the spirit, a little of that innate love of the beautiful which seems to have been part of the lives of those old craftsmen who have gone before us? Much of the charm of these cities is undoubtedly due to their associations and to the atmosphere of antiquity which surrounds them, but beyond all these there are many things which may well be studied with advantage by the most-up-to-date of town planners. Sitte's book, already alluded to, deals with this aspect of town planning in a most fascinating manner, and shows how town after town of mediæval times owes its picturesqueness, its quaintness, and often much of its artistic charm to the skilful grouping of the buildings, and perhaps above all to the intuitive sense of proportion in the —to us—haphazard dimensions and arrangement of the public "places," and to the irregular outlines of the street frontages.

Modern requirements demand that the streets shall be of ample width, and there can be no two opinions that the tree-planted street with its welcome shade and refreshing greenness is to be preferred to the narrow street of the older type or to the barren and scorching wilderness of dust or paving which is unfortunately so often typical of the modern city. There does not, however, appear to be any reason why we should not adopt at any rate a few of the principles which seem to have guided our forefathers to such successful results. It sounds almost sacrilege to say it, but it is just possible that our building acts and bye-laws may be in some way a mistake, that our rigid enforcement of building lines and regulations apparently aiming at establishing a perfectly straight unbroken expanse of blank wall—miles of it—without a projection of any sort if it can be avoided, may be misguided.

In laying out a new town or portion of a town the necessities of the future will naturally have precedence over all other considerations, and due regard must be given to:—(1) The lines and widths of main routes and directions of principal subsidiary streets, having regard to prevailing winds, traffic requirements, preservation of views, &c.; (2) Public buildings to be provided, churches, schools, public halls, theatres, baths, libraries, post offices, municipal buildings, and such like—their number and probable size; (3) Open spaces to be provided for (*a*) playgrounds, parks, and recreation grounds, (*b*) public squares, having regard to probable extent and grouping of public buildings, monuments, &c.; (4) districts to be reserved for factories and dwellings, and zones for limits of heights of buildings (if any).

Modern traffic requirements demand that all parts of a city shall be accessible to rapidly moving vehicles and, particularly since the advent of the motor, the idea seems to be general that these streets shall be as straight as a dart. The widths to be provided for the various classes of streets are of the utmost importance, and the possible direction of future lines of route should as far as possible be anticipated. The lesser subsidiary streets will naturally be planned in each case with due regard to the contour of the ground, direction of prevailing winds, access to railway stations and other points, and last but not least the question will have to be considered whether a straight or curved street is to be adopted. The cost of making up streets, macadamised or paved the full width, is considerable, and it would in many cases be cheaper and more effective to make up only the width necessary for the actual traffic, leaving grass margins at each side.

The approximate widths of various important streets are given below:—

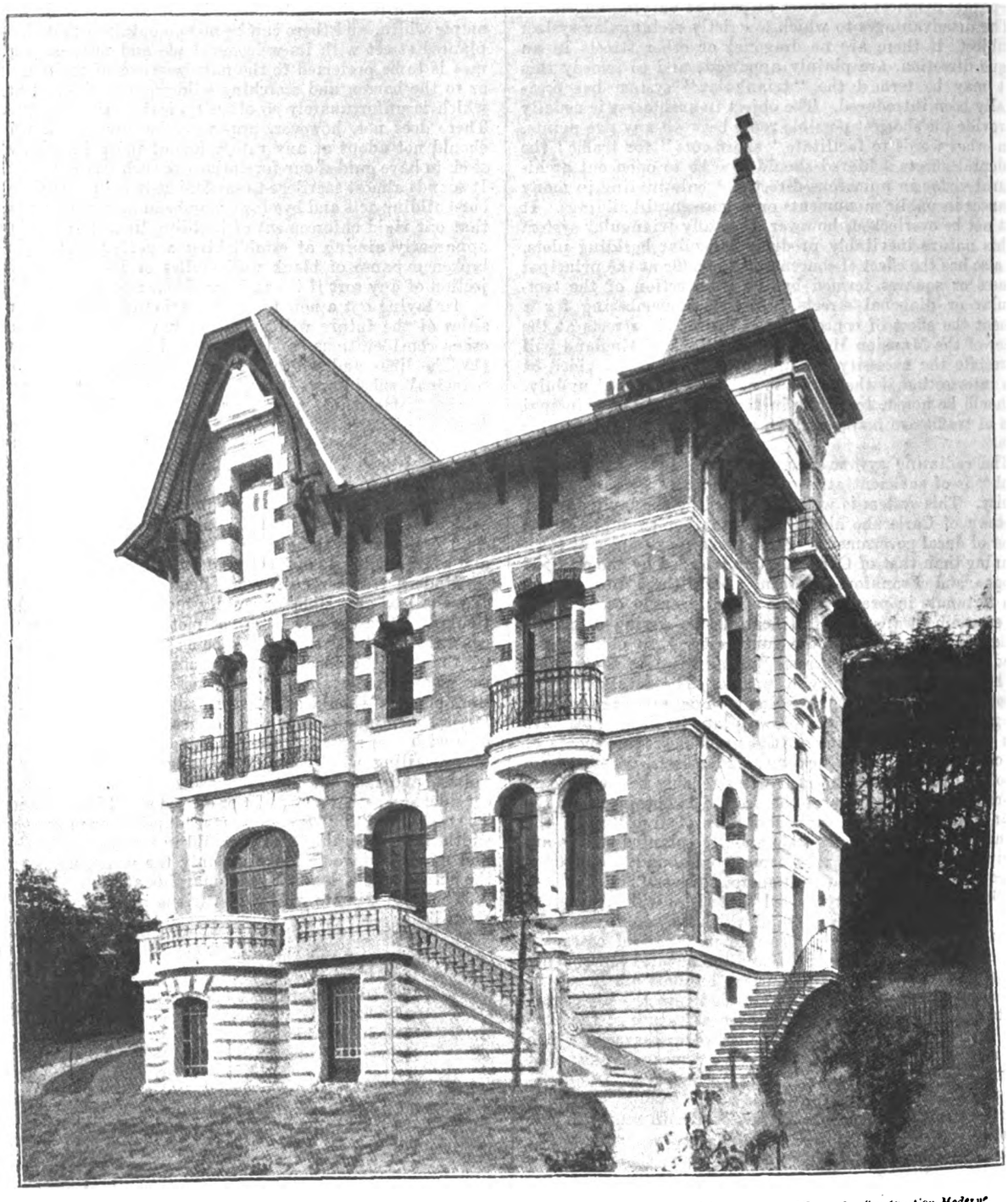
	Feet.
London—Kingsway and Aldwych Blackfriars Bridge	100
Victoria Embankment—near Westminster Bridge	130
Whitehall—widest portion	120 to 145
Holborn Viaduct and Northumberland Avenue	90
Regent Street Quadrant	85
Piccadilly	75
Queen Victoria Street	70
Oxford Street— Near Oxford Music Hall Near North Audley Street	58 to 88
Cheapside and Fleet Street	48 to 60
Edinburgh—Princes Street	100
Paris—Champs Elysées	230
Avenue de l'Opéra	93
Washington—Main Avenues	120 to 160
Vienna—Ring Strasse	186 to 200
Berlin—Unter den Linden	190
Frankfort—Ordinary tree-planted roads	65 to 78
Wider promenades	115

Broad straight thoroughfares are naturally best adapted for monumental avenues leading directly to some national or civic building of sufficient importance, and possibly it might also be added for main through roads conducting one to important towns. It is at least questionable, however, whether long straight streets do not lose much of their effect if constructed in too great profusion, and without any special objective. Such an avenue should have some special *raison d'être* to justify its existence, and it should terminate in something more inspiring than a dust destructor or a house of refreshment.

(To be concluded.)

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MODERN EUROPEAN ARCHITECTURE.
FRANCE.



COUNTRY HOUSE NEAR SAINT-ETIENNE.—M. ODIN, Architect. [From *La Construction Moderne*.

THE METHODS OF PAINTING ON STUCCO.*

THE ground upon which decorative efforts are made is something more than a mere surface. It is a foundation to which all colouring is an added quality. This is especially so with lime, which in past ages and with all nations has served for the interior surfaces of human habitations. Ancient remains, not only of lime surfaces but of added embellishment, bear a conclusive testimony to its permanence. At times in the world's history, when mural decoration was the occupation of men of genius, lime formed the ground for their greatest efforts. Thus upon this material has been produced the grandest of paintings. Apart from its permanent character, lime in its own nature is clear and bright, without gloss. It has that internal light which is aimed at in all fine colouring. Thus it is eminently suitable for a wall picture, lime painting well carried out resulting in that effect called "atmosphere," lime having a power of reflecting light, conveying that sense of spaciousness which is so desirable in all decoration. So favourable for the reception of colour has such a material been considered, that the Italian artists of the Renaissance prepared a surface of plaster of Paris for their large canvas pictures. Upon this they spread their colour with nothing except the medium which bound them between the lime and colours; a method by means of which even the lakes retain their tone for hundreds of years, and remain to-day in evidence of the harmless character of a lime ground.

In the finer specimens of the ancient wall paintings the lime ground was always considered, not only in its preparation, but also as entering into the painting itself. There are evidences that every advantage was taken of its special qualities. By means of pure water colours were used which were innocent of any disagreement with the lime. These were applied upon plaster freshly laid; the colours then penetrated the ground. Lime in the form of whitening was

* A paper read by Mr. William Fournis before the Paint and Varnish Society on November 4.

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MODERN EUROPEAN ARCHITECTURE.
FRANCE.



TOWN HOUSE, AVENUE DE MESSINE, PARIS.—M. LAVIROTTE, Architect. [From *La Construction Moderne.*

used as a white pigment. It therefore entered into the composition of all the tints, even into the shadow tones. Thus the painting and the ground itself were intimate, and of one nature. It could not then be said that the beauty of such a painting was only skin deep. In this way of working, called the "fresco buono" method, the excellent qualities of lime were shared both by the painting and the ground.

There were many ways possible of working in this masterful method. The painting could be executed either in impasto or glazes, or in a combination of both. Owing to difficulties existing in this process, it was necessary to entirely finish on the wet plaster a small portion of a large picture in one painting, the painter following the plasterer. A change also took place in the tone of the colours not only during the painting but for days afterwards. It was therefore necessary that a plan should be first thought out and rigidly adhered to, an idea of which may be formed from a description of the method adopted by Professor Pasciano when painting a head.

When working upon the newly-laid plaster, the professor had two earthenware pots, in one pure lime, in the other a very pale flesh tint. A lump of dry umber was reserved to try the colours on. He first painted the nimbus surrounding the head a pale yellow (he was copying the head from a coloured drawing), then he painted the head and neck a pale flesh colour, putting the colour in the cheeks and painting the mouth and eyes in slightly. Then he shaded the hair and drapery, deepening always with the same colours, which became darker and deeper every time they were applied, as they would upon paper. Having worked in this way for half an hour, he made a halt for ten minutes to let the colours sink in, which time he occupied himself in mixing darker tints, and then began loading the lights, using the colours much stiffer, putting his colours with precision and firmness, softening with a brush and a little water. He then again rested for ten minutes, but by this time he had the head nearly finished. He then put in a few light touches in the hair, again lightening the lights, touching also the

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darks, putting a little light in the nimbus. He again increased the number and density of his tints, finishing the whole head in one and a half hours.

"As when the hand some mimic form would paint,
It marks its purpose first in shadows faint.
And next, its stores of varied hues applied
Till outlines fade, and the full limbs arise."

Admirable as is the buono process for the achievement of a grand general effect, it has ever been found unmanageable for the smaller portions of a large picture. In the fine old wall paintings, when the utmost that the buono process was capable of was attained, to the same colours oleaginous, fatty or waxy matters were then added in order to obtain the facility necessary for the carrying out of small detail. This latter method was called "fresco secco" or "fresco mezzo" by Italian artists to distinguish it from the grander process, "fresco buono." Actually they both come under the name "tempera," which may be broadly defined as any process in which the colours are made up with a siccative and used bodily by means of water.

There are fine frescoes of the twelfth and thirteenth centuries in this country in a good condition still. Modern experiments, however, have not always been so complete a success as the older work has been. Even so great an artist as Watts, devoted as he was to fresco painting, in spite of his years of experiment had cause to lament that his work so soon showed signs of decay. The weakness of a fresco may occur from the simplest of causes. It may exist from the condition of the lime itself, it may be from attacks from without, or it may be brought about from a conflict set up between the lime and mineral pigments applied to it. The lime must be completely slaked so that no free lime is present. Fabulous statements have been made as to the length of time necessary to ensure this; that in Italy the grandson uses the lime the grandfather had laid down. As a matter of proved fact, lime may lose its best qualities if left slaking too long. The ordinary lime putty endures the wear and tear of our dwellings. If there is any doubt as to its condition, letting it lie in our own private lime pit for a few months will ensure its entire conversion. To do this is a better way than to make a surface of fresh lime and then leave it for a lengthy time before painting upon it. Even if then it is thoroughly opened by any means, it is far less favourable for the reception of colour than if first completely slaked and then laid for the immediate reception of colour.

There is no doubt that the damp, variable, acid-laden atmosphere of our cities is deadly in its effects upon a lime painting. Against this evil it must be protected, both from the back and the front. Every effort to divert moisture away from the painting must be taken. If it were rendered acid proof and waterproof it would be protected from its greatest enemy, and would further allow deposited dust to be washed away from its surface without damage, provided mechanical action is avoided.

Again, if only those pigments were used which agree in nature with the lime, no chemical reaction would occur.

For tempera painting, many substances have been adopted to spread and fix the colours such as fig tree juice, molasses, gums, &c., but perhaps of the many materials which have been tried caseine offers the greater possibilities. It mingles with lime with lasting results, ammonia acting as an alkali, whilst glycerine helps to dissolve it. When dissolved by means of these substances, and boiled linseed oil is added to it, an excellent emulsion is the result. It then forms a capable medium. One painting can be used over another, either in impasto or in glazes. It retains the fulness of colour natural to the pigments, without gloss, and there is no material difference in the colours in drying. If a wash of formaline is passed over the painting when it is finished it then becomes altogether washable, and absolutely resists damp.

Although caseine, mixed with lime or zinc white and used as a ground, does not change in its colour, remaining a permanent white, it is liable to crack if laid on too thickly. It also loses its virtue as a medium if kept for a time. It is less strong the next day after it has been made. It is best to use the emulsion directly it has been made.

Coagulated albumen offers another endurable medium with which to bind colour. The tenacity of such work may be proved by a description of a few tested experiments and the results. A strong wooden frame was lathed and received a rough rendering of Roman cement, which was chosen as being the nearest in nature to the celebrated pozzuoli of the ancients. Both sand and broken brick served to bind and give solidity to the rendering. After this was well scored, a second coat was applied, composed of white stone lime putty, a little Roman cement and marble dust. The finishing skin was lime putty, to which a little marble dust was added in order to get that "tooth" which is so agreeable for working upon in large work. The several coats were well trowelled (I believe plaster cannot be trowelled too much). They were worked one over the other whilst the under coat was damp, in order to obtain attachment between the several coats. The subject was painted in whilst the ground was green, the following colours being used:—

Whitening, yellow ochre, brown ochre, Roman ochre, the siennas, vermilion, venetian red, madder, the umbers, terra vert, ultramarine, cobalt blue, cobalt green, black. The medium used was obtained by whisking up the entire egg, yolk as well, in olive oil, as advised by Latilla. Oil is very friendly to lime, it causing the colour to be manageable. It is, however, the albumen in the egg which, when coagulated by the lime, remains as a permanent binder to the colours. After the finished painting had remained for a few days it could be gently washed. To still further fortify the work from the action of damp, a couple of coats of hydrofluoric acid were passed over the face of the painting, with an idea of giving to the stone the insoluble nature of feldspar, from which fluoric acid is obtained. Thus from damp the work was doubly sealed and could be satisfactorily washed with soap and water, although a soft sponge and pure water sufficed to remove deposited dust.

(*To be concluded.*)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* has an interesting article on "Some Essentials of Chimney Construction," by Mr. Arthur C. Bein, which is trenchant in its criticism, and advocates the use of a "wind-shelf," a device that has many friends but no scientific basis. Illustrations are given of the Orient Insurance Company's offices, Hartford, Conn.; the First National Bank, Hoboken, N.J., and the First National Bank Building, Lynchburg, Va., all classical buildings.

La Construction Moderne illustrates the new buildings for the post and telegraph department on the Cité Martignac, of which M. François le Cœur is the architect, and the tomb of Constant Coquelin at Pont-aux-Dames.

Deutsche Bauzeitung continues its articles on "Modern Synagogues," and now deals with the new one in Dessau. It also describes with views the new Rath-haus at Rixdorf, which has been illustrated in our series of examples of Modern European Architecture.

Der Profanbau has an account with very complete illustrations of the remarkably fine building of the Leipzic Life Assurance Society, the architect of which is Baurat A. Käppler, whose design, free from all "new art," shows that good work on purely Renaissance lines can still be found in Germany. That the "new art" feeling lends itself well to some classes of detail is seen from an article on "Cast-iron—old and new."

Moderne Bauformen this month devotes itself to the work of Dresden architects, much of which is domestic, though other buildings are included, even a gas-holder which is quite a successful piece of architecture. The club-house of the famous "Borussia" corps at Tübingen is topical just now.

The *Engineering Record* has an interesting illustrated account of the erection of a dome 98 feet internal diameter without centering at the cathedral of St. John the Divine, now in course of erection at Morningside Heights, New York City. After this one need not doubt the possibility of the dome of the Pantheon having been erected without centering.

The King of Portugal on Wednesday received a deputation of the British Fire Prevention Committee at the Portuguese Legation, and accepted an address presented on behalf of the Committee. One of the pioneers of the fire prevention propaganda of Europe was the late Chief Officer of the Oporto Fire Brigade, Mr. Fernandes, who was an honorary member of the British Fire Prevention Committee and an active supporter of its work both at home and on the Continent.

The National Trust for Places of Historic Interest or Natural Beauty have made an appeal, which has the support of His Majesty the King, for funds to purchase the land now offered for building lying between the Alexandra Gardens and the Curfew Tower at Windsor, in order that the greensward and trees may be preserved and the beauty of the famous view of Windsor Castle from the Thames may thus be saved from serious injury. The trees are of especial importance as they mask the gasworks and the railway station.

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The Architect.

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FORTHCOMING EVENTS.

Monday, December 6.

Liverpool Architectural Society: Paper on "The Development of Suburban Building Estates," by Mr. C. H. B. Quennell, F.R.I.B.A.

Surveyors' Institution: Paper on "The Direct Payment of Rates," by Mr. C. P. Hall, agent to the Duke of Bedford.

Wednesday, December 8.

Manchester Society of Architects: Paper on "Workmanship," by Mr. Henry Wilson.

Northern Architectural Association: A paper on professional affairs entitled "With Share and Mattock," by Mr. John W. Simpson, F.R.I.B.A.

Thursday, December 9.

Society of Architects: Paper on "Town Planning," by Mr. Raymond Unwin.

Leeds and Yorkshire Architectural Society: Paper on "Cuthbert Brodrick," the architect of the Leeds Town Hall, by Mr. Butler Wilson, F.R.I.B.A.

Paint and Varnish Society: Discussion on "The Advantages and Disadvantages of Washable Distemper," to be opened by Mr. J. Cruickshank Smith, B.Sc., F.C.S.

Friday, December 10.

Royal Academy of Arts: Distribution of Prizes to the students.

Architectural Association: Paper on "Varallo, Orta and Varese," by Mr. F. C. Eden.

ENGLISH LEADWORK.

As a material possessing capabilities of workmanship and an artistic expressiveness peculiarly its own, it is not surprising to find in these days of specialisation amongst antiquaries and connoisseurs that lead has completely captivated and enthralled at least one enthusiast. It is only by such specialisation and such attraction that one could hope to have the advantage of the complete and sumptuous monograph * on English leadwork that the learning and industry of Mr. LAWRENCE WEAVER has put into the hands of the architect, the sculptor, the craftsman, the owner and lover of gardens.

That lead has an individual character of its own will scarcely be questioned by anyone who takes the pleasure, rather than the trouble, of following Mr. WEAVER in his historical exposition of the use of lead combined with admirable criticism of the right or wrong treatment of the material in the numerous examples of old work of which he gives description and illustration.

No longer would it be supposed that, apart from its utilitarian employment, lead is suitable for decorative purposes merely because it is cheaper than bronze, more durable than iron or easily cast into ornamental form and painted to look like stone. Apropos of the facility with which lead can be cast and painted to look like something else, it may interest our readers to know the origin of the lead ornaments of the screen at Worstead Church of which the author speaks. When we were measuring this screen some quarter of a century ago the then sexton told us that when he assumed the office much of the carved ornament had been broken away, so as he could not carve wood he took moulds of what was left and cast replicas in lead to replace the missing work. Thus the leadwork on Worstead screen belongs to the last half of the nineteenth century. Whether the same remark applies to Ranworth we cannot say, for when we were there no one, sexton or other, seemed to have much pride or interest in this gem of East Anglian screenwork. We do not fancy that the original makers of the Norfolk screens would employ lead, as they were well acquainted with and frequently used gesso for casting repeated ornaments as well as for brush work in relief.

The disregard of the nineteenth century for lead, of which our author speaks, was probably largely due to the aversion which arose at the end of the eighteenth century, or soon after, for any work of architecture or sculpture which was not white. The men of that day were not content to wait for the patina which, as Mr. WEAVER points out, is one of the most charming attributes of old leadwork; they wanted everything white at the start, and it is quite possible that there may exist examples of early nineteenth-century work which, masquerading as stone under repeated coats of paint, have failed to reveal their true material.

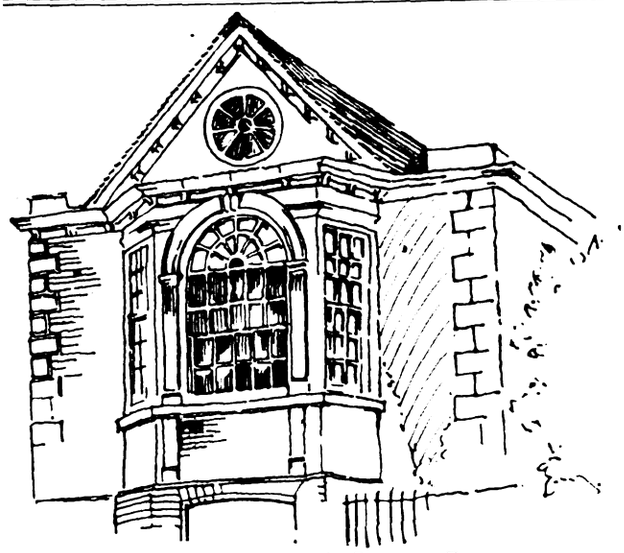
Mr. WEAVER has possibly done right in his exhaustive treatment of the history and use of lead to ignore, save for a couple of incidental references, the closely allied material, pewter, but in considering the modern artistic employment of lead it is worth noting that in Germany this alloy was very commonly preferred for sculpture and architectural ornament, whilst our English craftsmen were working in lead. It must not be forgotten, however, in this connection that the treatment which is suitable for lead cannot be exactly imitated in pewter without ignoring the characteristic expression peculiar to the alloy. Tinning as a superimposed decoration is evidently regarded by Mr. WEAVER as a legitimate treatment of lead, and there is surely, therefore, no reason why a designer should not avail himself of the potentialities of an alloy of lead and tin. In the wider sphere of the application of metals as accessories of architecture we may also bear in mind the modern alloys of aluminium, which have not yet been exploited to any extent as material for artistic expression.

The author's scheme in the treatment of his subject is the historical review of the use of his material under the heads of the various features in which it was principally employed. Thus we begin with fonts, and we are given the description and illustration of the thirty that, as far as Mr. WEAVER knows, and probably no one knows better, make up the total of those remaining. Of these more belong to the Norman period than to any other, and geographically more exist in Gloucestershire than any other county, whilst none are found north of Lincolnshire. As Mr. WEAVER points out, several of the Norman fonts are replicas of one pattern. So are many of the stone fonts of the Perpendicular period in East Anglia, and if lead was used at that period for the screens at Worstead and Ranworth, why was it not used for the fonts?

Two chapters are devoted to rain-water heads, one of the most favourite applications of decorative leadwork, and hence furnishing the author with much material which he has ably and fully utilised. Mr. WEAVER treats of spires, both Mediæval and Renaissance, of domes and lanterns. But it is when our author comes to portrait statues, lead figures generally and vases, the accessories of garden architecture, that we reach the divisions of the subject which we opine will at the present day be most generally studied and enjoyed. Very carefully and thoroughly has the history of the sculptors who worked in lead during the seventeenth and eighteenth centuries been investigated and recorded. The treasures of the gardens of Melbourne, Wrest Park, Wilton, Nun Monkton, Hard-

* *English Leadwork: its Art and History.* By Lawrence Weaver, F.S.A. (London: B. T. Batsford. 25*s.* net.)

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AT RYE.—From a Sketch by Banister Fletcher.

wick, Glemham and other notable houses are illustrated and described with in many cases identification of their designers and founders.

Our author commences his chapter on modern leadwork with a reference to the pessimistic utterance of the late Mr. J. Lewis Andre in 1888, when he said in a paper on English ornamental leadwork:—"I am compelled to come to the conclusion that most of the applications of ornament to leadwork belong to bygone times, and that a revival at the present day is hardly to be expected." It is the pleasure of Mr. Weaver to show the contradiction of this prophecy by putting before us instances of some of the excellent modern leadwork designed by architects of the present day. The examples given and our own experience point to the conclusion that the most troublesome characteristic of modern leadwork to the artist is its tendency to assume an undue sense of sharpness, which Mr. Weaver attributes to the influence of cast iron, but which we think is due rather to the spirit that actuates the best workmen amongst building operatives. Their idea seems to be that their highest aim should be to attain a precision in the handling of tools that will bring their work as nearly as possible to the mathematical precision of a machine. We are far from saying that the ideal of the highest possible technique in the handling of tools is unworthy of the craftsman, but there is a danger that in the attainment of this ideal the natural expression of a material may be lost.

The engineering trades have set up so high a standard of mechanical precision in workmanship that it is not surprising to find in the building trades the work of the joiner, the mason and even the plumber, especially as he sometimes works in zinc, approximating in our time to the precision of the man who makes an engine and who is constantly testing his work by gauge and micrometer. Our modern craftsmen in the building trade need to have developed their perception of the artistic expression of the material in which they work. Then it would not be necessary for architects to specify that half-timbering is to be worked with an adze or to adopt any other devices to escape from precision of workmanship in the attempt to capture artistic feeling. After all, precision of workmanship is a characteristic of our time, and, given the union with it of artistic perception and feeling, our modern work ought to surpass in artistic result the work of the past.

To assist in the development of the artistic perception and feeling of the leadworker every technical institute and every free library should possess at least one copy of Mr. Weaver's charming book, and every architect who desires to include in his buildings leadwork artistically worthy to stand alongside that of the past should see to it that his plumber's attention is drawn to the lessons that Mr. Weaver teaches. Every such architect will, of course, give a place in his library to the only book that adequately and completely shows what English leadwork has been and can be.

NOTES AND COMMENTS.

Another instance of the treatment which architects who win competitions for municipal buildings may suffer is afforded by the experience of Messrs. Russell & Cooper at Burslem. After modifying their designs very considerably to meet the views of the Town Council, and preparing everything ready for quantities and tenders, they are faced with the possibility that the work may not go on after all. A town's meeting on November 10 resolved that a poll of the ratepayers should be taken on the question whether Burslem should have a new town hall or not, and now the Town Council has virtually endorsed that demand, but postponed its final decision till the tenders are received a fortnight hence. Apparently, from the report of the Council meeting, the only alternatives to be decided at the postponed meeting of the Council are whether that body shall itself give the *coup de grâce* to the scheme or shall leave it to be determined by a poll of the ratepayers. Here is a chance for the Board of Professional Defence of the Royal Institute of British Architects to justify its existence by taking care that competitions shall be barred by the Council when there is no certainty that the work competed for will ever be carried out. If public authorities generally are going to follow the example of Burslem it will be high time that the architectural profession should see to it that the German system is adopted and premiums offered that are worth trying for, independently of the job, instead of being, as they are with us, so small that usually the second man just covers the expense of his competition drawings, and the recipient of the third premium gets about half what his drawings cost him.

The present by-laws of Birmingham relating to new streets and buildings being in a rather chaotic condition, the City Council has resolved to adopt new ones as regards buildings, which not only bring together scattered enactments, but are more up to date so as to deal with hollow walls, the determination of the length of walls by piers as well as by cross-walls, the use of steel-frame construction and other modern improvements in buildings both constructional and hygienic.

Although the demolition of the north side of Bath Street, in the city of Bath, has commenced, the Old Bath Preservation Society is keeping up the fight and means to die in the last ditch, as expressed in the following resolution:—"This committee, observing that a portion of the north side of Bath Street is now being prepared for demolition, expresses its surprise and indignation that the Corporation of Bath should not only have failed to interfere to prevent this injury to the city, but should actually have brought pressure to bear on Messrs. Waring to proceed with the scheme, and this after the remarkable body of testimony from the Royal Institute of British Architects, the Society of Antiquaries, the Society for the Protection of Ancient Buildings, the National Trust for the Preservation of Places of Historic Interest, from many eminent persons and from leaders of opinion connected with the principal London newspapers and the Press generally, that the destruction of this unique street would be a loss to the city and a deduction from the reputation of Bath. The committee further resolves to communicate this resolution to the Corporation, to Messrs. Waring, and to the London and provincial Press, in the hope that the mischief may even yet be averted." We fear the hope of the committee is without foundation.

There seems to be little doubt to any unprejudiced person that Dr. Bode and the Berlin Museum have been "had" in the matter of the wax bust of *Flora* that has been purchased as the work of Leonardo da Vinci. The front view accords with the picture by Da Vinci, from which Lucas is said to have modelled the bust, but the side view and profile bear clear evidence of early Victorian feeling. Leonardo's unquestionable wax models are in pure beeswax; the Berlin bust is filled in with wax mixed with resin and wrapped in nineteenth century cloth.

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What a commentary on the folly of paying absurdly inflated prices for antiques, when a learned and experienced connoisseur, such as Dr. BODE must be admitted to be, can be taken unawares, as it seems to us he undoubtedly has been. One can understand a high price being paid for a work of art because it is transcendently beautiful, a work of genius, but not that 90 per cent. of the value depends on its age and its authenticity.

THE purchase of antique works of art is to-day as much a species of gambling as dealing in cotton or copper for forward delivery. Sometimes the gambler makes a good thing out of his speculation, and this class of patron of art will be encouraged to plunge a bit more by the report of the latest deal in Rembrandts. M. PAUL DELAROFF, Privy Councillor, of St. Petersburg, bought a Rembrandt, genuine on the authority of Dr. BODE, a few years ago for 4,000*l.* and has now sold it to Messrs. AGNEW for over 15,000*l.* The latest purchasers know their business, and we may be sure will make a profit on the deal, and so the game of inflated prices goes merrily on and will continue to go on whilst millionaires are still to be found who measure the value of artistic treasures by the number of dollars they pay for them.

WE are going to have something extra good in the way of exhibitions and pageants next year. The Anglo-Jap at the White City should be interesting for its artistic merit. The Festival of Empire at the Crystal Palace should touch the Imperialist sympathy. Sir ASTON WEBB, R.A., is connected with this latter venture, and has cut the first sod of the open-air theatre on the Greek model, in which is to be presented the pageant that is to unfold the history of London. Perhaps the promoters of the scheme have an idea that, as the Lord Mayor's Show this year was denuded of its circus element, the people of London will rush in their thousands to the Crystal Palace for consolation.

MR. E. DORAN WEBB, F.S.A., at the invitation of the University Extension Lectures Association, has been lecturing at Salisbury on Old Sarum, the seat of one of the earliest manifestations of civilisation in this country. His lecture was divided into four parts, dealing first with the conjectural history of Old Sarum, with the tribal conditions of the people; secondly, with the Roman occupation; thirdly, the Saxon invasion down to the time of the transplanting of the cathedral to New Sarum; fourthly, to our own time. The excavations have been suspended till the spring, and it is estimated will require an expenditure of some 600*l.* to 700*l.* for eight or ten years.

THE *City Press* has reprinted from "Hone's Year Book," published in 1832, the following table of the cost of WREN'S London churches and the Monument, and if the figures generally are as correct as the exactitude of the farthings would imply, it is a valuable record:—

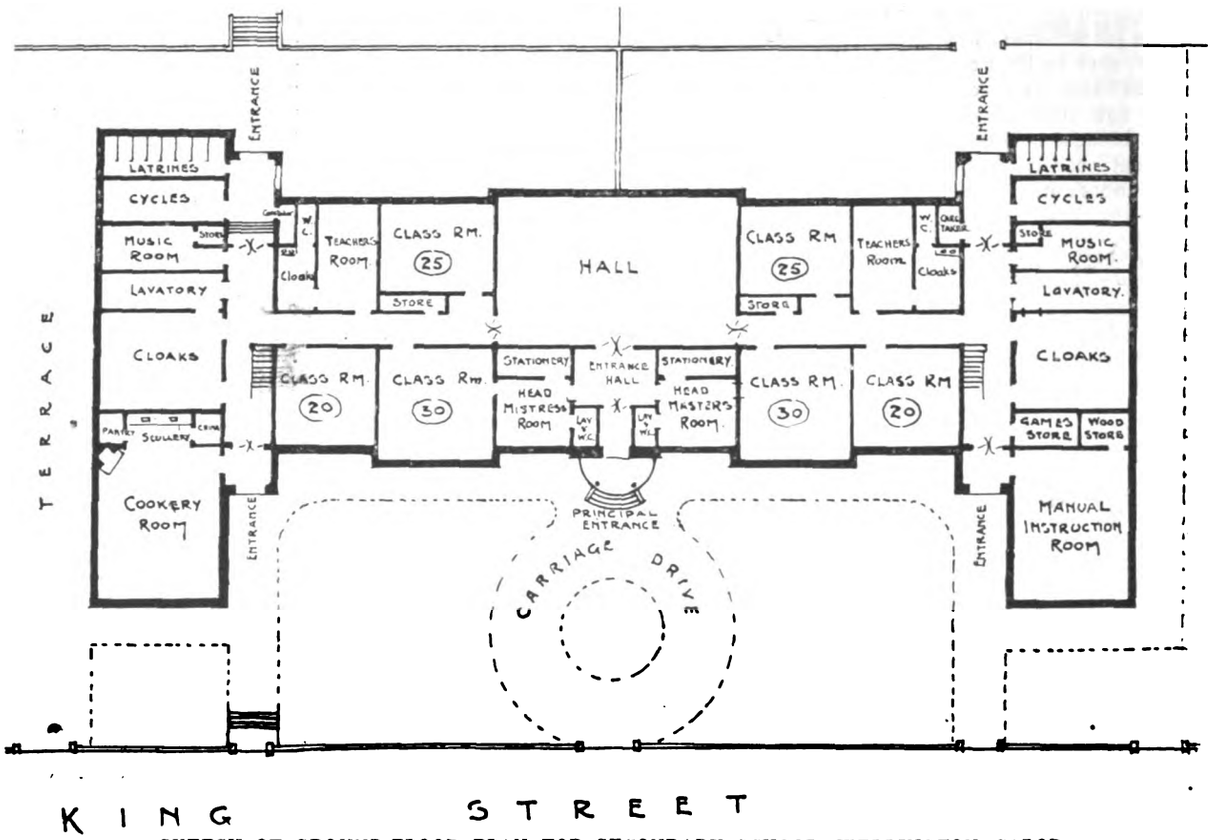
The cost of the London churches built by Sir Christopher Wren, including the Monument.

St. Paul's Cathedral	£736.752 2 3½
All Hallows the Great	5.641 9 9
All Hallows, Bread Street	3.348 7 2
All Hallows, Lombard Street	8.058 15 6
St. Alban, Wood Street	3.165 0 8
St. Anne and Agnes	2,448 0 10
St. Andrew Wardrobe	7,060 16 11
St. Andrew, Holborn	9.000 0 0
St. Antholin	5,685 5 10¾
St. Austin	3,145 3 10
St. Benet, Gracechurch	3,583 9 5¼
St. Benet, Paul's Wharf	3,328 18 10
St. Benet Fink	4,129 16 10
St. Bride	11,430 5 11
St. Bartholomew	5,077 1 1
Christ Church	11,788 9 6
St. Clement, Eastcheap	4.365 3 4½
St. Clement Danes	8,786 17 0½
St. Dionis, Backchurch	£5.737 10 8
St. Edmund-the-King	5,707 11 0
St. George, Botolph Lane	4,509 4 10
St. James, Garlick Hill	5,357 12 10
St. James, Westminster	8,500 0 0
St. Lawrence Jewry	11,870 1 9
St. Michael, Basinghall	2,822 17 1
St. Michael Royal	7,455 7 9
St. Michael, Queenhithe	4,354 3 8
St. Michael, Wood Street	2,554 2 11
St. Michael, Crooked Lane	4,541 5 11
St. Michael, Cornhill	4,696 5 11
St. Martin, Ludgate	5,378 18 8
St. Matthew, Friday Street	2,301 8 2
St. Margaret Pattens	4.986 10 4
St. Margaret, Lothbury	5,340 8 1
St. Mary Abchurch	4,922 2 4½
St. Mary Magdalen	4,291 12 9¼
St. Mary Somerset	6,579 18 1¼
St. Mary-at-Hill	3.980 12 3
St. Mary, Aldermanbury	5.237 3 6
St. Mary-le-Bow	8,071 18 1
St. Mary-le-Steeple	7.388 8 7¾
St. Magnus, London Bridge	9.579 19 10
St. Mildred, Bread Street	3.705 13 6¼
St. Mildred, Poultry	4,654 9 7¾
St. Nicholas Cole Abbey	5.042 6 11
St. Olave, Jewry	5,580 4 10
St. Peter, Cornhill	5.647 8 2
St. Swithin, Cannon Street	4.687 4 6
St. Stephen, Walbrook	7,652 13 8
St. Stephen, Coleman Street	4,020 16 6
St. Vedast, Foster Lane	1,853 15 6
The Monument	8,856 8 0

THE limiting of competitions by geographical area has at Oldham resulted in some rather amusing episodes. The competition for the extension of Oldham's town hall is to be limited to architects residing in the borough. Thereupon an architect residing outside the borough—wise man!—but with an office in town, asked if he might compete. Another, who not only resides, but apparently has his office outside the borough limits, thought he was eligible because his gas was supplied by the Oldham Corporation. The finance committee of the Council held that neither of these gentlemen was eligible. Hard lines!

INTERESTING results have been reached in the excavations at Corbridge, the Roman Corstopitum, which have been going on since 1906, and were described in a lecture to the members of the Carlisle Scientific and Literary Society by Mr. R. H. FOSTER, M.A. The site of the excavations is to the west of Corbridge, on the north bank of the Tyne at a point where a Roman bridge carried Dere or Watling Street across the river. Unlike many Roman cities now overlain by modern towns, Corstopitum is situate in open fields, and by the aid of the foundations which have been uncovered an idea of the plan of the place, the direction of the streets and the character of the buildings has been disclosed. They incline to the arrangements common to a civil community combined with features more definitely military. In 1907 a large and important building, probably a private residence, which had been many times altered and extended, was discovered on the rising ground to the north-east of the bridge. In its latest stage it comprised a series of eight apartments arranged between two corridors, and returned at both ends towards the south. The south corridor was warmed by a pillared hypocaust below the floor, divided midway in its length by a door, the threshold of which is still *in situ*. Hypocausts of larger size but rougher construction were found under two of the rooms at the west end of the building, and one of the eastern rooms was warmed by a series of boxed wall tiles. The wall plaster on some of the rooms had been repeatedly decorated in colours. On the south front of the house there was a cobbled terrace overlooking the river below, and on the north an enclosed courtyard, paved with cobbles, and containing an ornamental cistern, in which was found a fine piece of sculpture of a lion and a stag. On the plateau to

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SKETCH OF GROUND-FLOOR PLAN FOR SECONDARY SCHOOL, WELLINGTON, SALOP.
Selected Design by Messrs. Shayler, Swan & Ridge, Architects.

the north, and possibly in the central district of the city, massive and important buildings were encountered. These bordered on a street about 36 feet in width of three different levels, with corresponding drains and gutter stones. The buildings comprised a store in which, under a mass of burnt stuff, was discovered a quantity of pottery, strewn, as it had fallen from the shelves, in separate heaps. The discoveries of 1908 were most important and interesting. Operations were commenced on the wide east to west street through the town. They revealed on the north side four structures, two of them strong buttressed barns or granaries at right angles to the street and almost 100 feet in length; the fountain and a portion of a massive building comprising a number of chambers arranged about a quadrangle, the west range of which is 221 feet in length, and had for convenience been called the "Forum." Of the noteworthy finds, the most remarkable was that of a hoard of gold coins, forty-eight in number, enclosed, together with a gold ring, in a piece of lead, and secreted 18 inches below the present ground level in a building of late date. The coins included examples of the reigns of Valentinian I., Valens, Gratian, Valentinian II., Theodosius and Magnus Maximus, and ranged between the inclusive dates of 370-85. The coins were all in an excellent state of preservation, and with the exception of a find at Cleeve, near Cheltenham, in 1811, constituted the largest find of Roman gold coins made in Britain. The excavations of last year also produced a remarkable quantity of fragments of pottery, Samian ware being very abundant. Other kinds of pottery were also plentiful, ranging from Castor ware to rude black hand-made pottery. The work done during the past season (1909) has been important, if in some respects less striking, than in 1908. Further explorations in front of the granaries has revealed the fact that the southern or street face of each had had a portico of four massive pillars. In the case of the east granary, this portico was probably of the same date as the main building—viz. about A.D. 140. The other portico was of later date, and was probably added in the time of Severus to a building which possibly dated as far back as A.D. 120.

COMPETITION DRAWINGS FOR SECONDARY SCHOOLS AT WELLINGTON AND WHITCHURCH, SALOP.

In response to the Education Committee's invitation, twelve sets of designs were submitted for the Wellington School and nineteen sets for the Whitchurch School, and Mr. H. Beswick, F.R.I.B.A., of Chester, was appointed assessor.

WELLINGTON SCHOOL.

The designs generally were excellent in conception and of good draughtsmanship.

The successful design is that submitted by Messrs. Shayler, Swan & Ridge, of Shrewsbury, Oswestry, and Birmingham, whose plans were highly coloured, with elevations nicely treated in the Georgian style, accompanied by a good half-inch detail.

The accompanying sketches will enable our readers to see the type of design accepted. We do not consider the positions or shape of the music-rooms ideal, and the cloak-room spurs with their respective cookery and manual rooms might with advantage be remodelled on the lines of Plan No. 3, which had the music-rooms to the front and the cookery and manual rooms in the rear.

We are of opinion that the amount the Committee stipulated as the cost of the building—viz., 7,000*l.*—will be insufficient, even with the 10 per cent. margin, as the sum has to include heating, lighting, ventilation, boundary walls, fencing and laying out playgrounds.

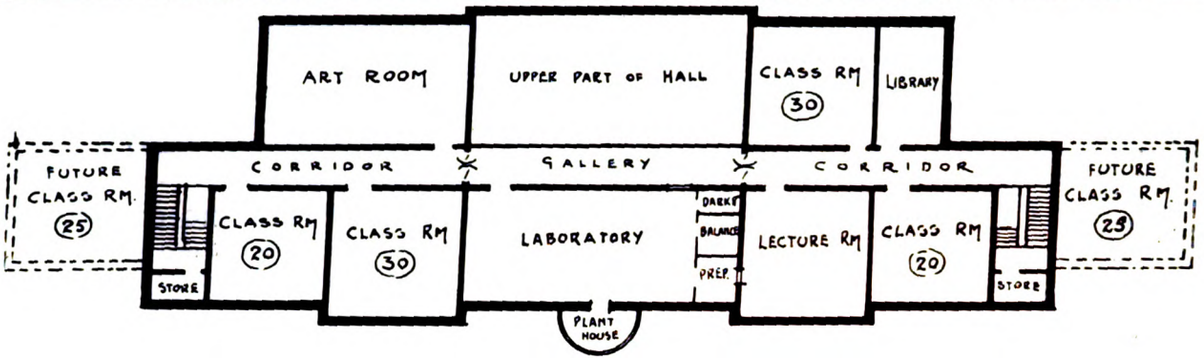
WHITCHURCH SCHOOL.

The selected design for this school is that of Mr. J. Holt, A.R.I.B.A., of Manchester, and many good points are embodied in the plans.

In this case also we doubt the sum allowed—viz. 5,000*l.*—being sufficient.

The two designs are both somewhat similar in arrangement.

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FIRST FLOOR PLAN.

SKETCH OF FIRST-FLOOR PLAN FOR SECONDARY SCHOOL, WELLINGTON, SALOP.
Selected Design by Messrs. SHAYLER, SWAN & RIDGE, Architects.

PRESTON GRAMMAR SCHOOL COMPETITION.

IN response to the Committee's invitation, 179 designs were received.

The site is situated in a good position overlooking Moor Park, with frontages to Moor Park Avenue and St. Thomas's Road. At the east end of the site a plot is reserved for the erection at some future date of a headmaster's house.

The accommodation required was for 250 boys, with provision for two or more class-rooms in the future. The principal requirements were assembly hall with seven class-rooms (inclusive of sixth-form room) for senior boys, and three class-rooms for junior boys, the latter to be planned to form an integral part of the school, and be so arranged that they could be assembled or dismissed without interference with the rest of the school.

Mr. F. W. CATTERALL, of Preston, was appointed assessor, and his award is as follows:—

1st. Messrs. WOOLFALL & ECCLES, F.R.I.B.A., *Liverpool.*

2nd. Mr. A. J. GREENWOOD, Manchester.

3rd. Messrs. PACKER, DREWITT & DREWITT, A.R.I.B.A., Southport.

One of the conditions of the competition was that the school must be planned with an assembly hall, with the class-rooms approached conveniently from the hall or its galleries or corridors. Corridors must be avoided as far as possible, and where necessary should be short, well lighted, and of sufficient width to allow space for exhibition designs, models, appliances, and lockers. This clause naturally led competitors in general to adopt the central-hall type of plan with the class-rooms grouped round and entered from the hall—in fact, all the competitors with the exception of the first premiated adopted the type of plan.

Many of the designs were remarkable for the ingenuity displayed in reducing the corridor space to a minimum, and for their thought and trouble they are rewarded by seeing a design selected which has corridor round three sides of the hall, to say nothing of long covered ways to the latrines and manual instruction room, and a long length of future corridor to the future class-rooms.

The following extract taken from the *Lancashire Daily Post* of Thursday, the 25th ult., will be interesting to the competitors:—

Alderman Craven moved that the Council agree to the recommendation of the Education Committee that the premiums in connection with the competitive designs for the new Grammar School be awarded as follows:—

Design No. 9: Messrs. Woolfall & Eccles, Liverpool, 50*l.*

Design No. 97: Mr. Arthur T. Greenwood, Manchester, 30*l.*

Design No. 134: Messrs. Parker, Drewitt & Drewitt, Southport, 20*l.*

In moving the recommendation, Alderman Craven said the assessor considered that set No. 9 was by far the best both in plan and design, and the one that most nearly fulfilled the requirements of the committee. On an inspection of the plans the committee were unanimous in confirming the assessor's award. Set No. 9 was described as excellent, and was almost the only one that had a self-contained hall with open-timbered roof, whilst the character of the design was much more suitable for a grammar school than that of any other design submitted. The planning of the buildings was the most important from the scholastic point of view, and it was also not unimportant from the financial point of view—from the scholastic because on it depended the whole convenience of working, and from the financial because according to the compactness of the building and the utilisation of the space at command so would economy of building expenses be effected. The plans recommended appealed strongly on both these sides. They were conveniently grouped round one centre, the assembly hall, and every possible device for compactness, both in the buildings themselves and in the playgrounds and outbuildings, had been employed.

As an instance of this he might refer to the way in which the classrooms adjoined the assembly hall, whereby not only did each form become enabled to work as a separate unit without interference to any other unit, but whereby also a maximum use could be made of the ventilation at command. The two playgrounds fitted well into each other without unduly and wastefully carving up the site, and the manual instruction room and the gymnasium were suitably combined in one outstanding building. The Sixth Form was placed conveniently to the headmaster's room, and the waiting room and the porter's room were arranged close to the entrance. The scholars' common room was placed in handy proximity to the playground, and the chemical laboratory was well away from the ordinary classrooms.

The elevation was a question of wider educational considerations than the ordinary scholastic ones, and the design recommended had a dignified and pleasing elevation well worthy of the best traditions of the Preston Grammar School.

Compared with the present buildings, said Alderman Craven, the design recommended possessed the following, among other, additional accommodation:—A central hall for assembly and meeting purposes; an art room with a north aspect; a manual instruction room and a gymnasium; a kitchen and dining-room and a common room and library; a convenient section for junior boys, with separate class-rooms, playgrounds, &c.; an assistant master's room; and a waiting and porter's room.

Messrs. WOOLFALL & ECCLES's design is not one that would be easy of supervision, and the seniors' and juniors' entrances both being at the one end, might lead to confusion in the corridors at the times of assembly and dismissal. The playgrounds are good, and have the latrines in a good position, and well masked—a great advantage on such a prominent site. The elevations are picturesque in the Tudor style.

Mr. GREENWOOD adopts a type of plan in which he gets all class-rooms to the south, which necessitates a long length of corridor, but as the same is straight from end to end, supervision should not be difficult. The

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position of the kitchen on the ground floor, and the dining-room on the first floor, will not enable the latter room to be readily served. The position of the manual room and the gymnasium is not good, as the junior boys will have to approach the same through the senior boys' playground.

Messrs. Packer, Drewitt & Drewitt's design is very compact, and has all class-rooms to the south. The manual instruction room adjoining the hall is not good, and would be better isolated, and also the gymnasium.

Many interesting designs were submitted, and worthy of mention were those by:—

Mr. G. H. Willoughby, Manchester; Messrs. Cheers & Smith, Blackburn; Messrs. Shaw & Vowles, Burnley; Messrs. Woodhouse, Corbet & Dean, Manchester; Messrs. Sharp & Clarke, London; Messrs. Stones & Stones, Blackburn; Messrs. Hickton & Farmer, Walsall; Messrs. F. E. & A. Milne, Glasgow; Mr. Richard Holt, Design B., Liverpool; Messrs. Leather & Wilson, Cardiff; Messrs. Shepherd & Bower, Liverpool; Messrs. J. Grundy & Son, Ulverston; Messrs. Wills & Anderson, London; Mr. F. W. Mee, Manchester; Messrs. Appleyard & Quiggin, Liverpool; Messrs. Buckland & Farmer, Birmingham; Messrs. Castle & Warren, London; Mr. J. P. Osborne, Birmingham; Messrs. Sankey & Cubbon, Manchester; Mr. C. Taylor, Oldham; Mr. P. D. Lodge, Manchester; Messrs. Honan & Beveridge, Liverpool.

ROYAL ARCHÆOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND.

The report of the Council for the session 1908-9 states that upon the recommendation of the chartered accountants the accounts for the year ended December 31, 1908, are set out in a different manner and in greater detail than heretofore. In the income and expenditure account an income from all sources of 728*l.* 6*s.* is shown, and an expenditure of 724*l.* 3*s.* 1*d.*, leaving a credit balance of 4*l.* 2*s.* 11*d.*, carried to the balance sheet. Among the items of expenditure the Council desire to call attention to the sum of 200*l.*, being the James Hilton bequest, and a further sum of 175*l.* 6*s.*, both of which have been invested during the year. The investments standing in the names of the trustees are set out in the balance sheet, and on December 31, 1908, they aggregated the sum of 1,673*l.* 11*s.* 6*d.*

All charges appertaining to the year are paid.

Two members, whose subscriptions for several years have not been paid, have been amoved.

Two vacancies have occurred among the Honorary Vice-Presidents consequent on the deaths of Lieut.-Colonel Baylis, M.A., V.D., K.C., and Mr. George E. Fox, M.A., F.S.A. The Council recommend that one of these vacancies be filled by the nomination of Mr. C. E. Keyser, M.A., F.S.A., to be an Honorary Vice-President.

The senior Vice-President, Mr. W. H. St. John Hope, M.A., retires by rotation, and the Council recommend Mr. Mill Stephenson, B.A., F.S.A., to be the new Vice-President.

The members of the Council who retire by rotation under the new rule are Messrs. R. Garraway Rice, F.S.A., A. Ridley Bax, F.S.A., H. Plowman, F.S.A., General Fagan, Herbert Jones, F.S.A., and A. H. Lyell, M.A., F.S.A. Two further vacancies are created by the death of Mr. F. G. Hilton Price, Dir.S.A., and by the recommendation that Mr. C. E. Keyser be nominated an Honorary Vice-President. To fill the eight vacancies the Council recommend the names of Messrs. C. A. Bradford, F.S.A., M. S. Giuseppi, F.S.A., T. T. Greg, M.A., F.S.A., Professor F. J. Haverfield, M.A., LL.D., F.S.A., P. M. Martineau, J. H. Etherington Smith, M.A., F.S.A., W. H. Aymer Vallance, M.A., F.S.A., and W. W. Watts, F.S.A. It is also recommended that Mr. H. Plowman, F.S.A., be appointed auditor for the current year.

The loss of members during the session 1908-9 by resignation is twelve, by amoval two, and by death twelve, of whom four were life-compounders, and two libraries have ceased to subscribe. The number of new members elected during the same period is thirty-five, two of whom are life-compounders; seven new libraries have been added to the list of subscribers. The substantial increase leaves the Institute with fourteen more members and subscribers than last year, and has considerably strengthened its financial position at a time when the membership of many other societies is decreasing.

Among those who have passed away the Council regret to record the names of Lieut.-Colonel Baylis, M.A., V.D., K.C., Mr. George E. Fox, M.A., F.S.A., Mr. W. O. Roper, F.S.A., Mr. F. G. Hilton Price, Dir.S.A., Lord Egerton of Tatton, Mr. J. Parkinson, Lord Braye, the Very Rev. R. M. Blakiston, M.A., F.S.A., and the Marquess of Ripon.

THE METHODS OF PAINTING ON STUCCO.*

(Continued from last week.)

Another large panel was carried out in the following manner. The rough rendering consisted of three of coarse Thames sand, one of blue lias lime. This is very fat in its nature and also contains a quantity of clay. This rendering was allowed to stand for four days. The second consisted of one of chalk lime putty, two of blue lias. This coat was applied a half inch thick. The last skin consisted of four of chalk lime putty, one of marble dust. A little plaster of Paris was used in all the coats with the idea that it would help to bind and set the plaster.

In the painting of this the egg and oil was used, but the hydrofluoric acid was not applied. It was varnished instead, requiring no sizing beforehand, since the medium used in the painting had stopped all suction.

For each of these experiments the lime and marble dust were both ground up together with distilled water. The plaster was well slopped to delay its drying, the whole going down together and the colour having a chance to enter the lime. In all fresco work the colours appear to bite better on slow drying plaster. Although Roman and blue lias was used in these experiments, and both stood the test well, yet Aberthol Welsh hydraulic lime is reported to be the best for the purpose. These experimental panels were subjected to the trial brought about by a constantly varying atmosphere, placed high up above hot-water pipes in a gas-lighted class-room, in which was a coke stove, the vitiated air being at times at a temperature of 100 degrees. This test they successfully resisted for twenty years, a tribute to the permanence of coloured plaster.

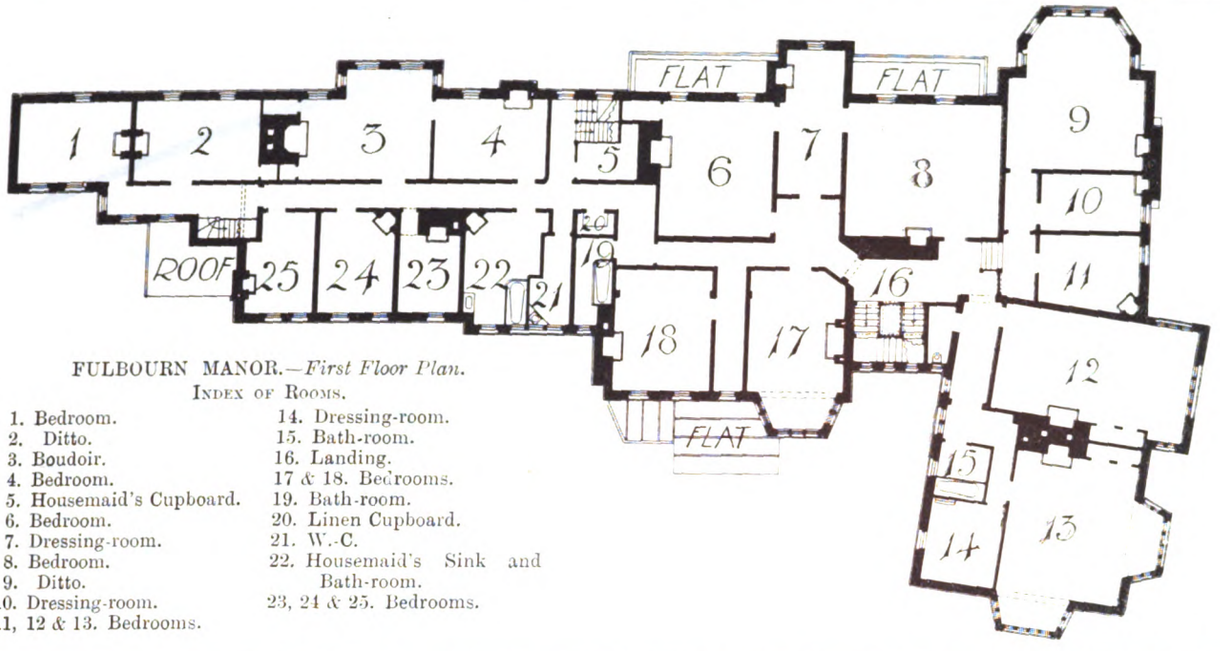
On so important a subject it is necessary to be critical and to arrive at practical conclusions. The medium and the marble dust together caused the painting to tend to remain on the surface. The last ingredient need not have been used; either sand or marble dust is only needed when raised work is required. After many years, upon being washed, the painted surface of the unvarnished one showed a dryness and a loss of "value" in the force of the colours. The oil, too, darkened them. However, when the work was wetted with water the colours revived, and if it then received a coat of olive oil their strength returned. The varnished one was covered with minute cracks.

It has ever been considered that to merely mix a binder with the colour, even if a fixative is passed over the finished painting, something more is needed, some process to counteract friability of surface. To harden the plaster and prevent it cracking, to enable it to resist damp and deleterious acids, a method is necessary which would be as facile under the hands of the worker as is oil painting, with no baffling difference in the colour when applied, and when in its final condition it is desirable also that the colours should have a power of penetration to sink into the ground so that both become of one substance and nature, and clarity of tone preserved so that the painting is not a mere skin on the surface.

A process has been used in which wax is mixed in the colours, incorporated with the ground, and also covering the surface of the painting. In ancient days the Greeks were in the habit of so doing. Frequently after the painting was finished they gave the entire surface a coat of wax, afterwards passing fire in a brazier in front of the face of the painting so as to incorporate the whole. Then the painted surface was burnished by rubbing a bone or ivory palette knife over it; thus was obtained a dull polish. At other times a subject painted in tempera received a coat of melted wax, which was afterwards polished by means of a piece of linen or silk. The use of heat to make the wax workable was necessary in those days. In later years a way had been arrived at of reducing the wax by means of spirit, hardening it with gum and keeping it from setting too quickly by either spike lavender, aniseed, or balsam, thus producing an excellent medium to mix with the colours. This combination has been used for a considerable number of years by decorative artists. Gambier Parry, to his honour and our

* A paper read by Mr. William Fourniss before the Paint and Varnish Society on November 4.

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FULBOURN MANOR.—*First Floor Plan.*

INDEX OF ROOMS.

1. Bedroom.
2. Ditto.
3. Boudoir.
4. Bedroom.
5. Housemaid's Cupboard.
6. Bedroom.
7. Dressing-room.
8. Bedroom.
9. Ditto.
10. Dressing-room.
11, 12 & 13. Bedrooms.
14. Dressing-room.
15. Bath-room.
16. Landing.
17 & 18. Bedrooms.
19. Bath-room.
20. Linen Cupboard.
21. W.-C.
22. Housemaid's Sink and Bath-room.
23, 24 & 25. Bedrooms.

convenience, has published the best proportion of the ingredients for this medium. He has also carried out some very fine mural painting with its assistance, naming it "spirit fresco."

Perhaps the greatest experiment which has been made of late years in this process consists in the two grand lunettes, "The Arts of War" and "The Arts of Peace" in the South Kensington Museum. We are fortunate in possessing in the *Art Workers' Quarterly* a full and detailed description, written by James Ward, who assisted in carrying out the whole of the work. It is a valuable record, as it is minute and practical. Although of such interest and so serviceable as a guide, yet one feels compelled to demur at the coat of paint given to the surface of the lime in which was incorporated white lead. This would certainly not conduce either to the permanence or brilliancy of the painting afterwards applied. If it was desired to have a solid ground, why not have used zinc white?

(To be concluded.)

ARCHITECTURAL ASSOCIATION DEBATING SOCIETY.

THE fifth meeting of the session was held on Friday, November 26, when a debate took place upon "Competitions—Open *v.* Limited." Mr. K. Gammell spoke in favour of open competitions where it was a question of public buildings to be erected with public money. In such cases he contended it was morally wrong for a public body to select a limited number of architects to compete, and it was only fair to the young and unknown architects to have an opportunity of submitting a design. An open competition was the only way of obtaining the best design.

Mr. W. G. Wilson in opposing Mr. Gammell, and speaking in favour of limited competitions, said that public bodies had not only to see that they obtained the best design, but that the architect was capable of carrying it out, and in this respect a competition was useless. Further, that in the case of an open competition where there were such large numbers of designs submitted it was humanly speaking impossible to say which was really the best; the competition then becomes a gamble. He also said that to contend in open competitions was not the best way for a young architect to build up a practice.

Messrs. Hamp, R. Smith, Forster, Jacob, Ross and Bullock took part in the debate.

Mr. A. H. Belcher was in the chair, and on a show of hands he declared the voting to be in favour of "open" competitions by a majority of one.

The next meeting will be a joint meeting with the junior members of the Surveyors' Institution, and will be held at 18 Tufton Street, on Friday, December 17, when Mr. Raymond Unwin will move "That the planning of towns and estates should be designed by an architect assisted by a surveyor."

ILLUSTRATIONS.

FULBOURN MANOR, CAMBS.—GARDEN FRONT—LODGE—CARRIAGE-DRIVE FRONT—DETAIL OF FRONT DOOR AND PORCH—DINING-ROOM—BALL-ROOM—HALL—BILLIARD-ROOM INGLE—STAIRCASE—HALL FIREPLACE—FIREPLACE IN MR. TOWNLEY'S ROOM.

THE house was full of old-oak panelling which had been hidden away in cupboards, bedrooms, &c., and in nearly all cases painted. This panelling has now been restored and refixed in several of the ground-floor rooms.

The mantelpiece in hall was found canvassed and papered over in one of the bedrooms. This same bedroom was doubly panelled, the outside panelling being painted, but the inside unpainted and carved. The ceiling of dining-room was found behind a sham plaster ceiling. The mantelpiece in dining-room was an old Jacobean bed-head found in the roof.

Nearly the whole house has been rebuilt, and as far as possible in the original style, as it was the owner's express wish that the features of the old portion should be reproduced in the new work. The windows in the hall have been filled with the coats of arms of various branches of the owner's family. A new lodge has been erected, and in the grounds there is a beautiful old Tudor manor-house, now used as a laundry. The whole of the work has been excellently carried out by Mr. JOHN A. HUNT, of Hoddesdon, all the panelling, old oak work, &c., being restored in his shops.

The electric light was done by Messrs. TAMPLIN & MAKOVSKI of Charles Street, Haymarket, S.W.; wrought-iron work, locks, &c., by BLUNT & WRAY, 49 Red Lion Street, W.C.; stone carving by DAYMOND & SON, Vauxhall Bridge Road; heraldic glazing by HORACE WILKINSON, 109 Great Russell Street, W.C.; heating apparatus, fire hydrants, by STRODE & Co., 48 Osnaburgh Street, N.W.; wood-block floor by GODDARD & SONS, Farnham, Surrey; the strong room by CHUBB & SONS, St. James's Street, S.W.; bedroom mantelpieces, stable fittings, &c., by MACINTOSH & SON, Cambridge; steel casements to lodge by W. SMITH, Balcombe Street, N.W.; lightning conductors by DIXON & CORBITT, 130 Strand, W.C.; consulting engineer, EDMUND CHARRINGTON, A.M.I.C.E., 90 Queen Street, Cheapside, E.C.

The whole of the work was carried out for the Rev. CHARLES TOWNLEY, M.A., to plans, &c., and under the superintendence of DUDLEY NEWMAN, F.R.I.B.A., architect.

MEMORIAL SCREEN IN FULBOURN ST. VIGOT.

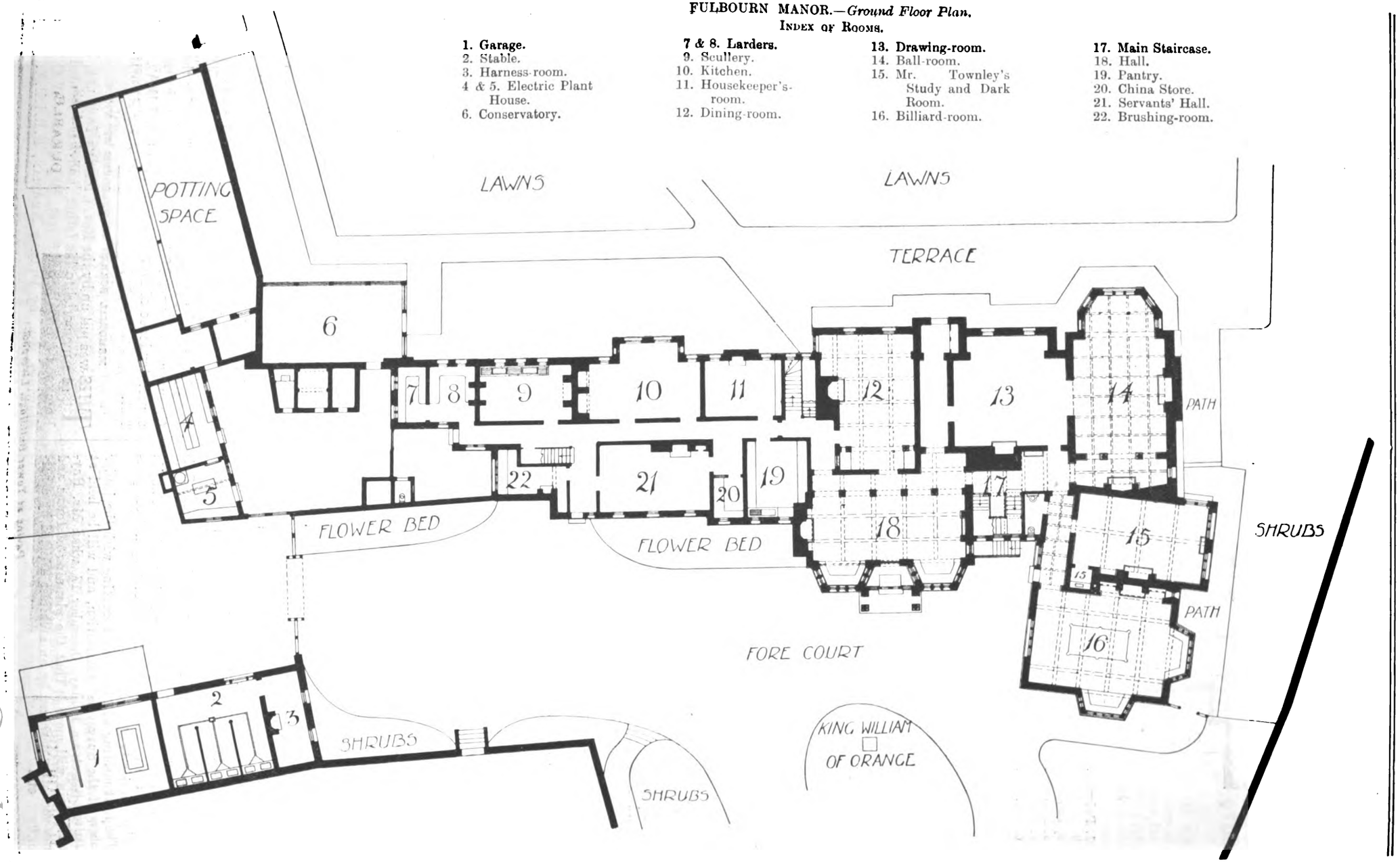
THIS was put up by the Rev. CHARLES TOWNLEY, M.A., as a memorial to his father, and was executed by A. ROBINSON & SON, Broad Street, Bloomsbury, W.C., from drawings, &c., by DUDLEY NEWMAN, F.R.I.B.A.

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FULBOURN MANOR.—*Ground Floor Plan.*

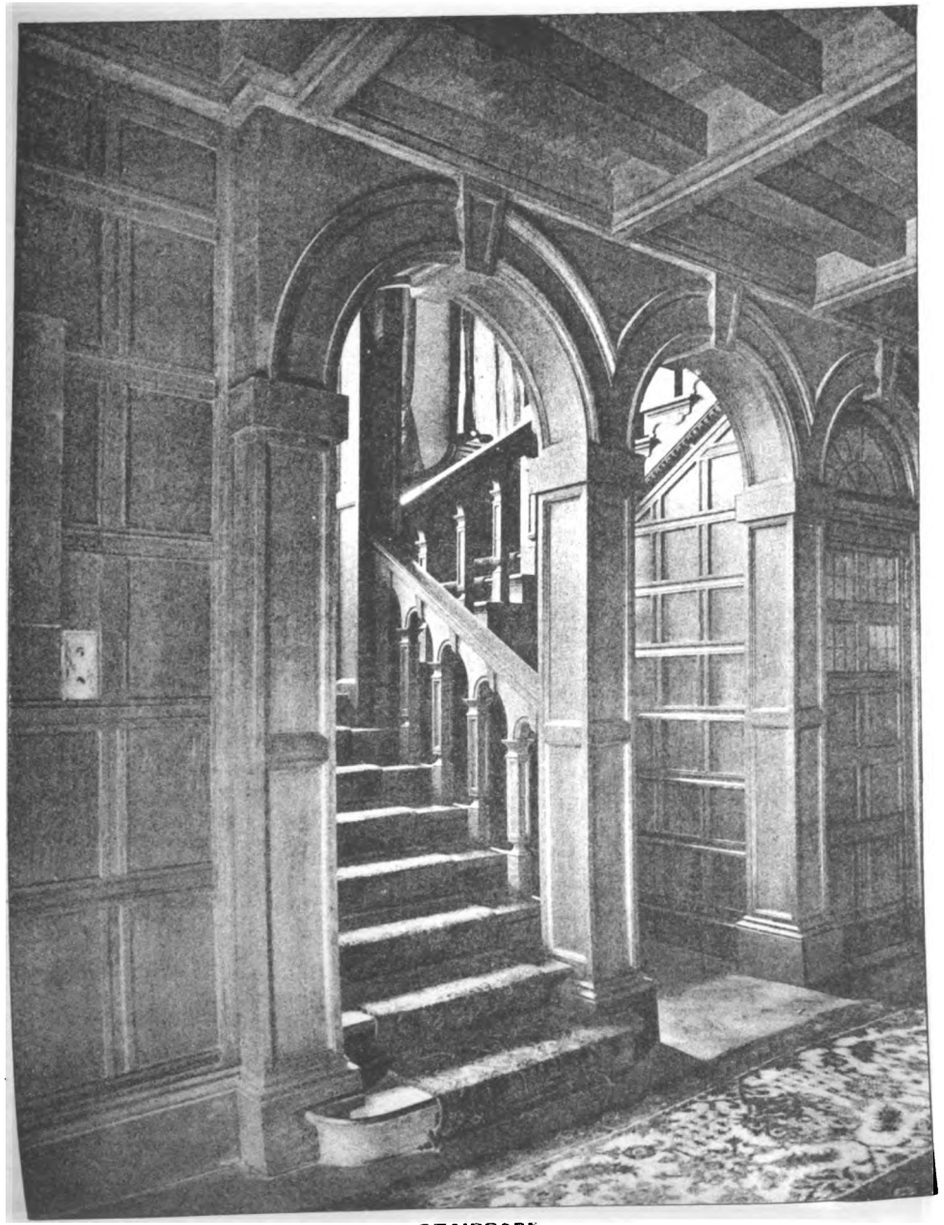
INDEX OF ROOMS.

1. Garage.
2. Stable.
3. Harness-room.
4 & 5. Electric Plant House.
6. Conservatory.
7 & 8. Larders.
9. Scullery.
10. Kitchen.
11. Housekeeper's-room.
12. Dining-room.
13. Drawing-room.
14. Ball-room.
15. Mr. Townley's Study and Dark Room.
16. Billiard-room.
17. Main Staircase.
18. Hall.
19. Pantry.
20. China Store.
21. Servants' Hall.
22. Brushing-room.



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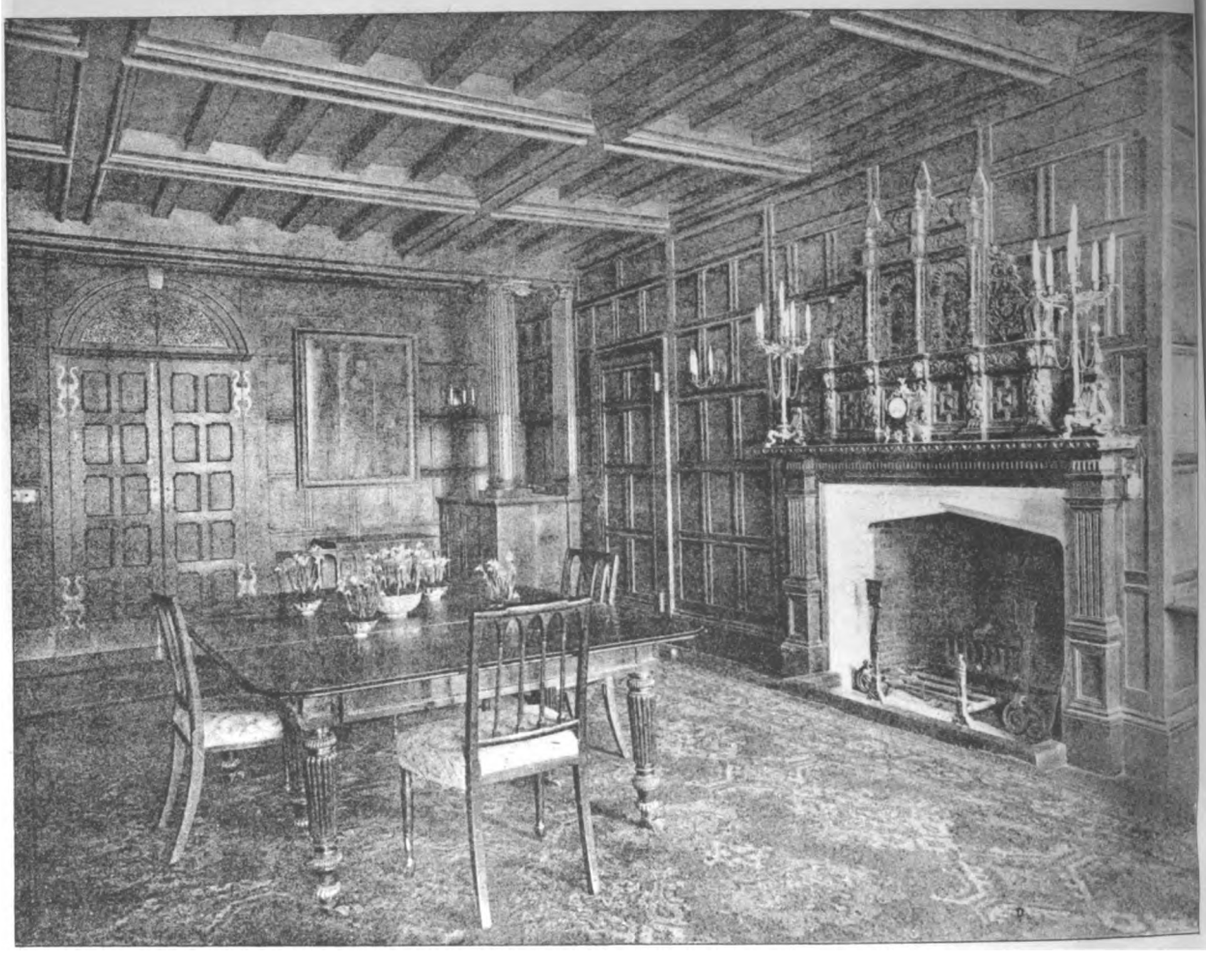


STAIRCASE.

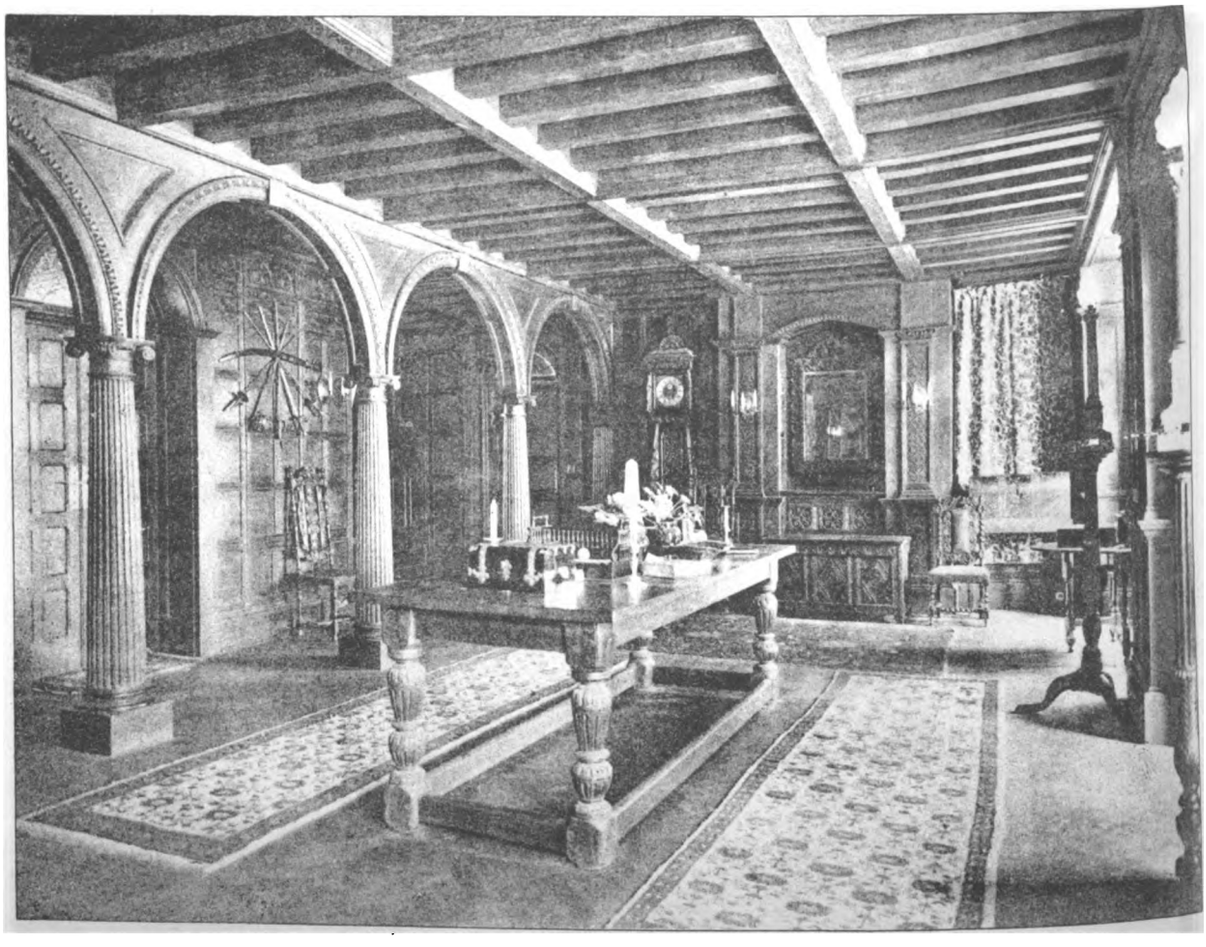


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DINING ROOM.

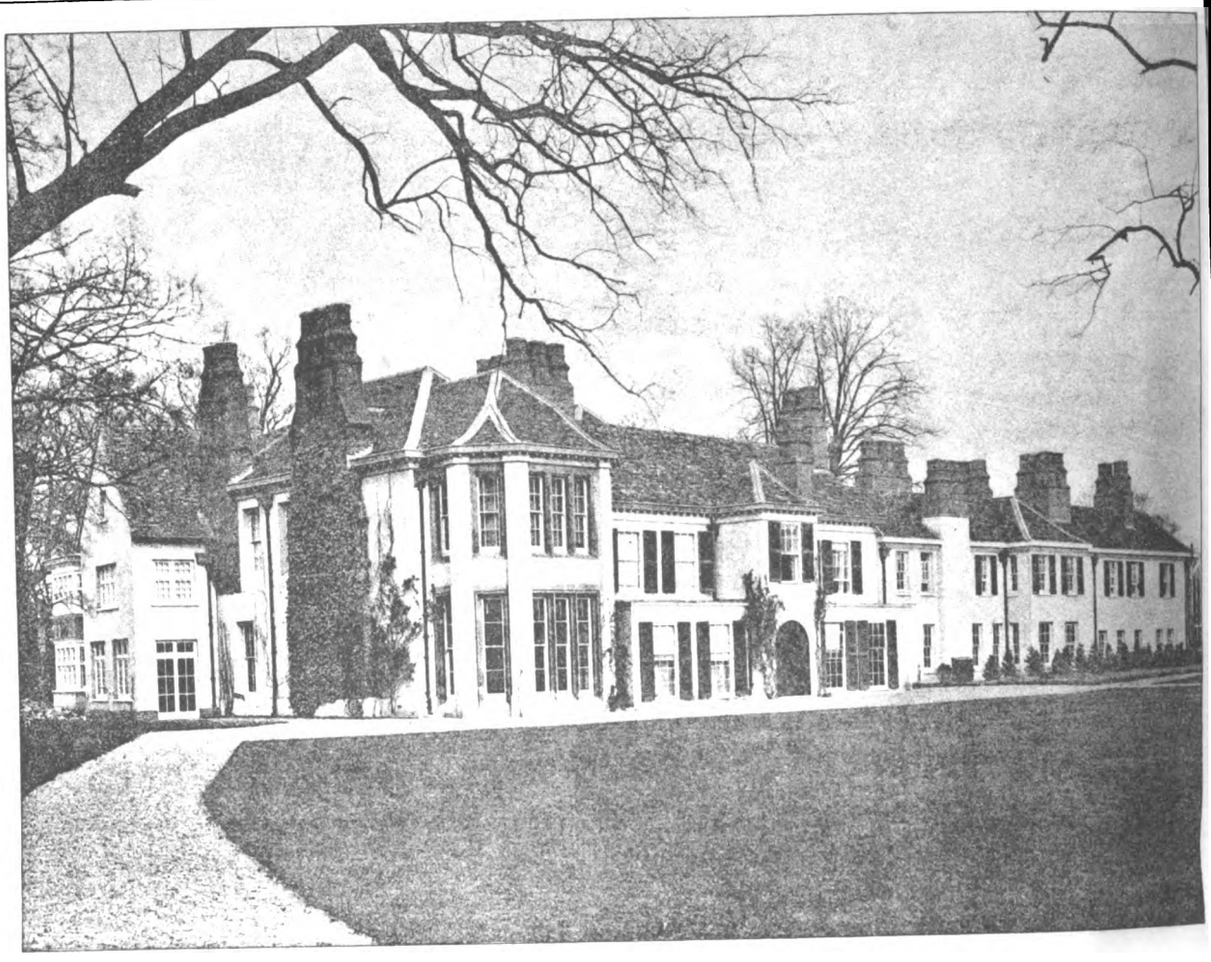


HALL.

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FULBOURN
DUDLEY NEW

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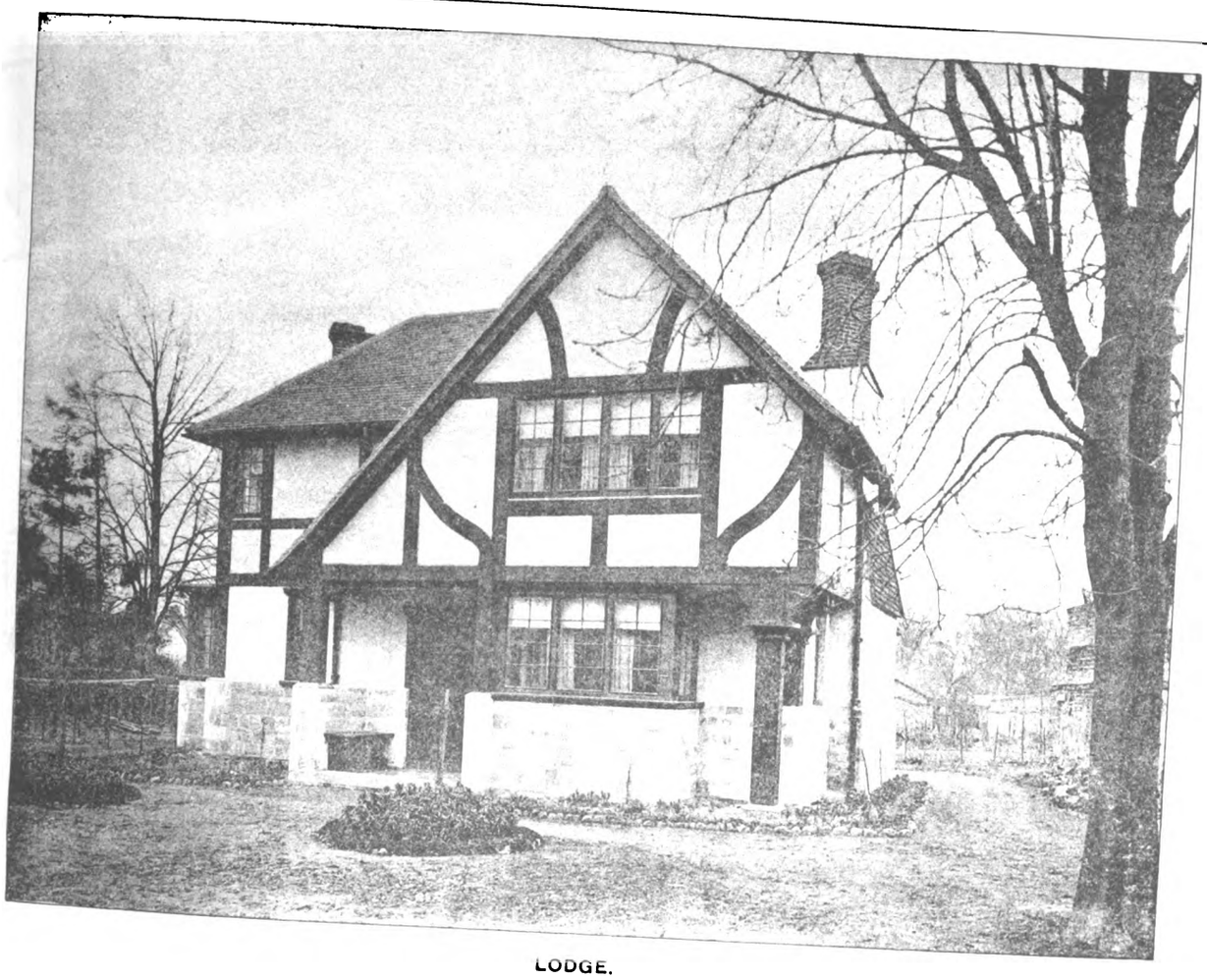
GARDEN FRONT.



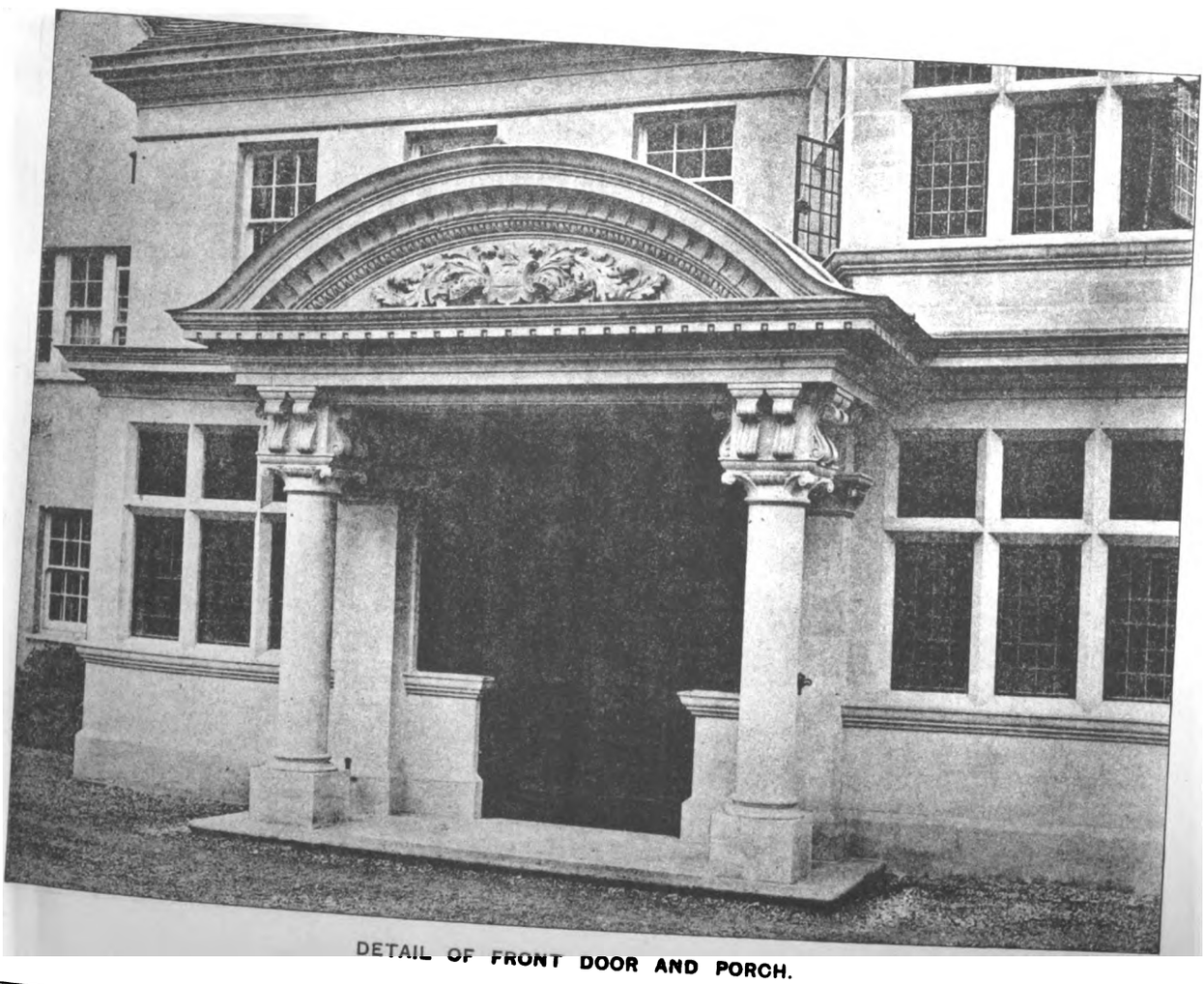
CARRIAGE-DRIVE FRONT.

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FULBOURN
DUDLEY NE



LODGE.



DETAIL OF FRONT DOOR AND PORCH.

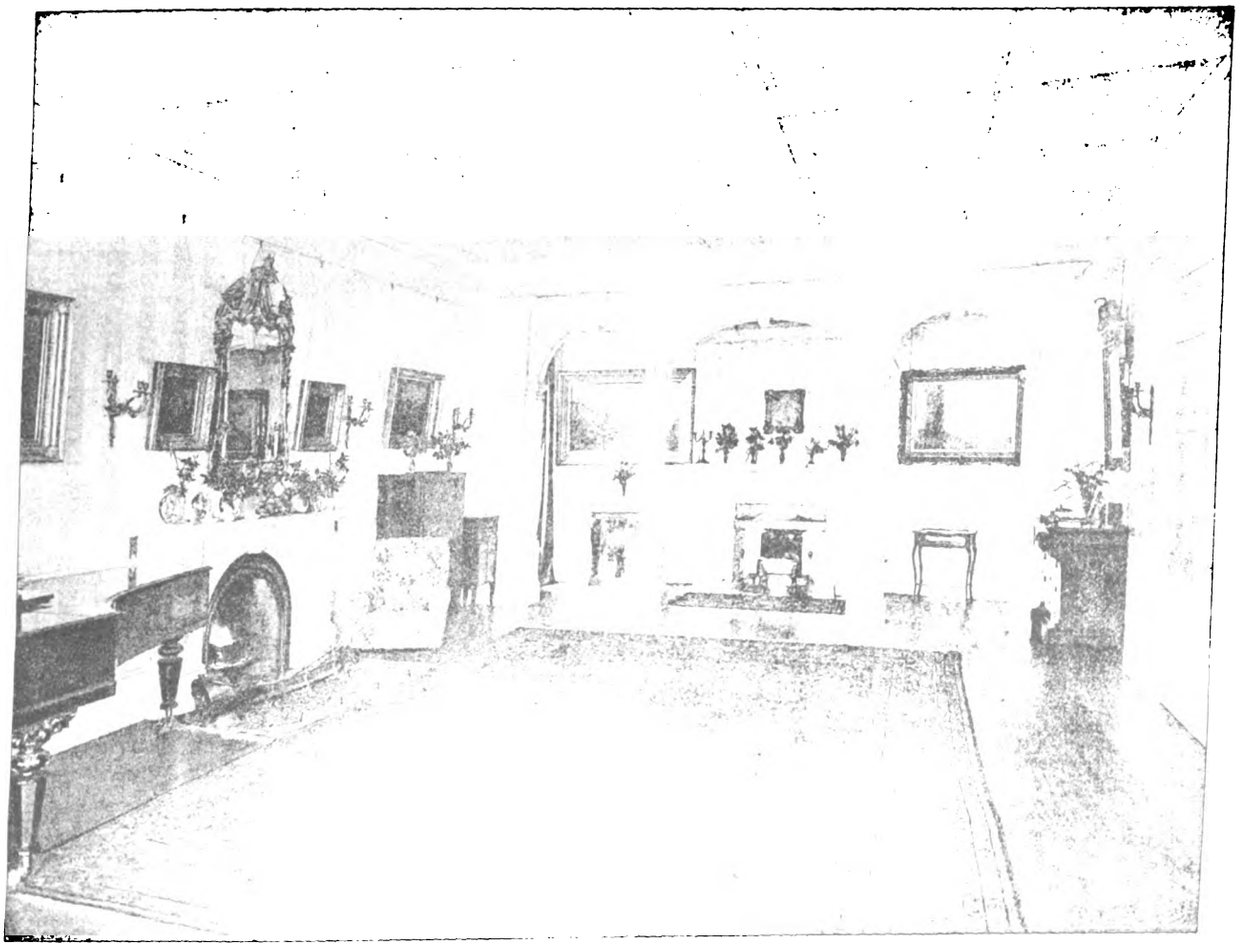
R, CAMBS.
B.A., Architect.

INK PHOTO SPRAGUE & C° L° 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

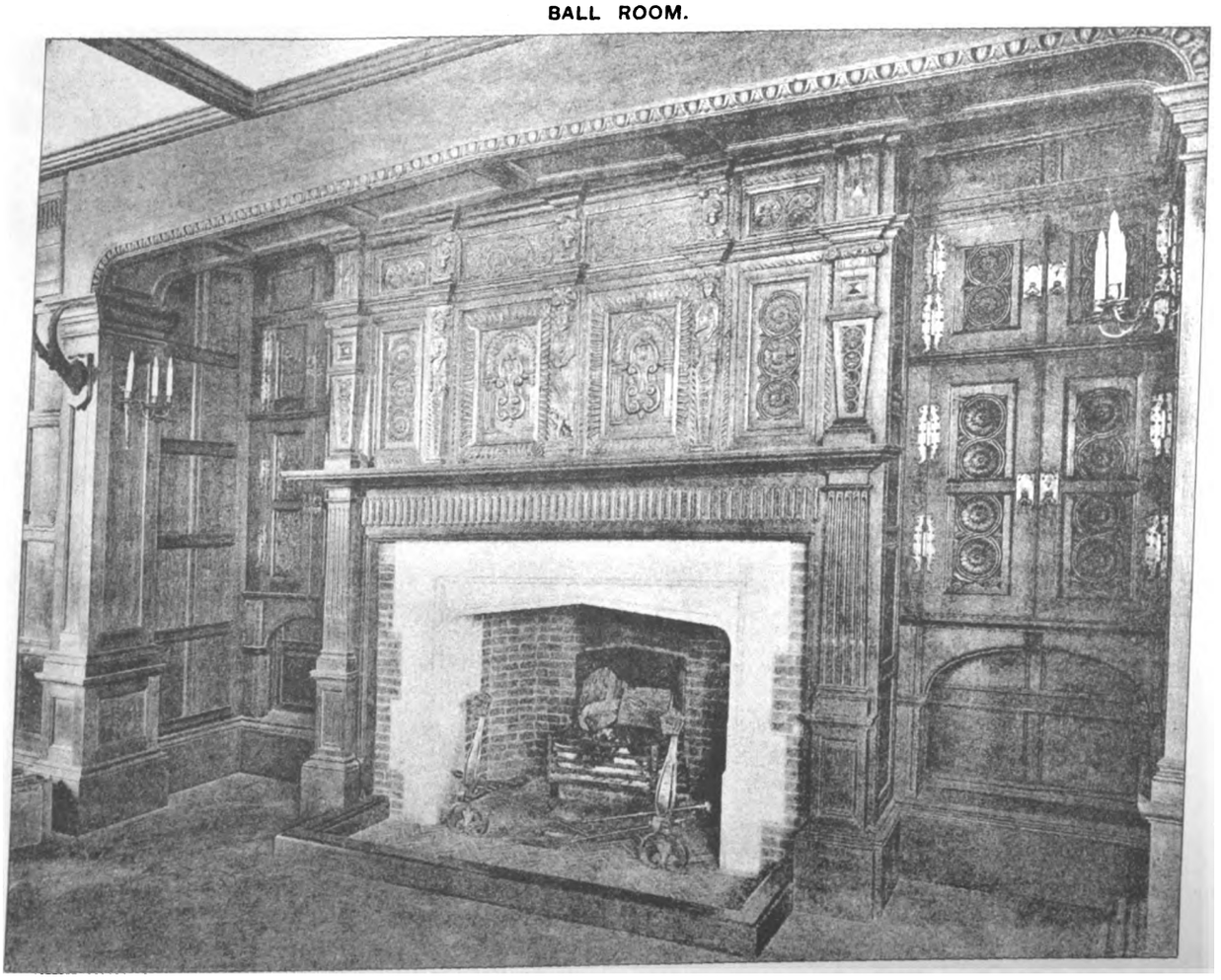
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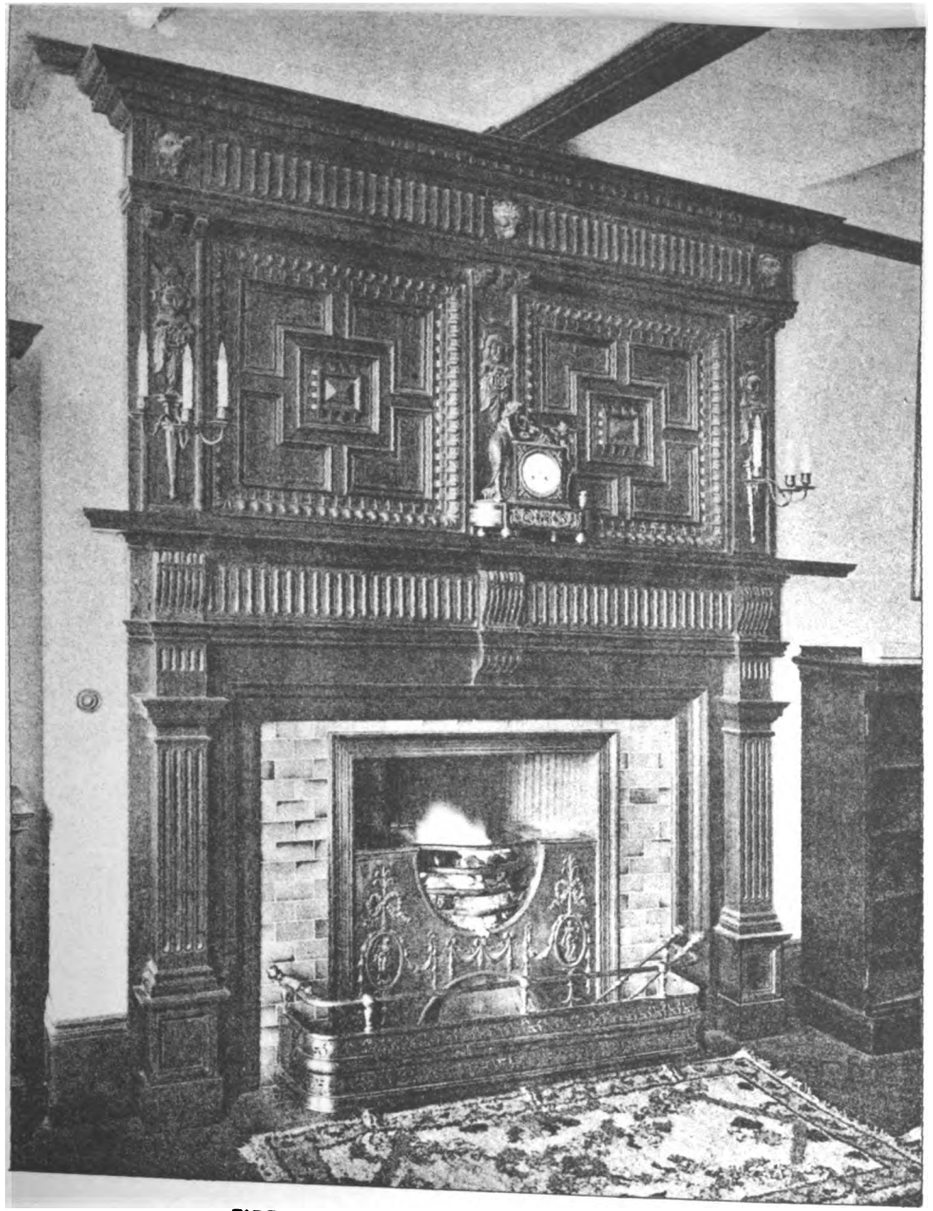
BALL ROOM.



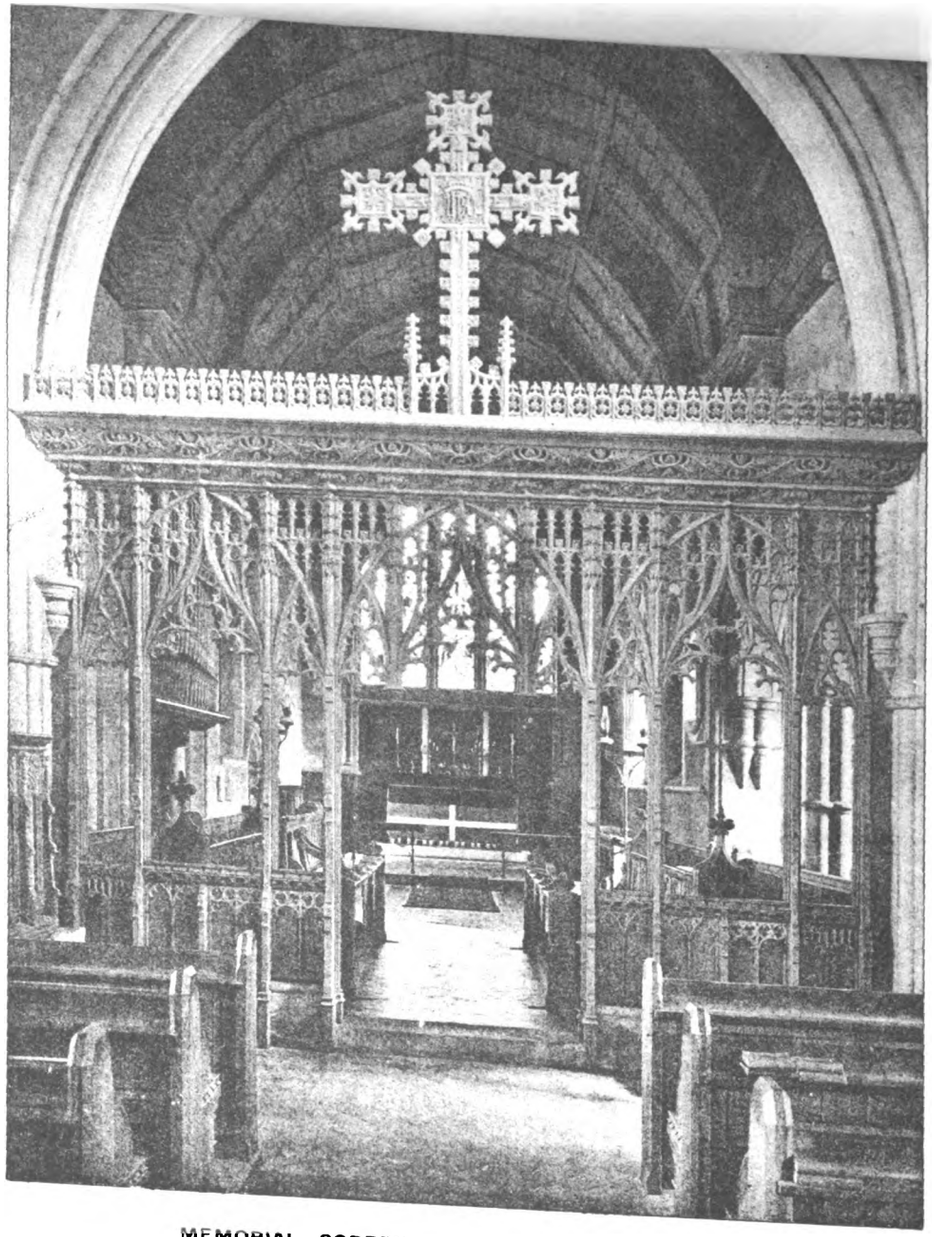
BILLIARD-ROOM INGLE.

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FIREPLACE IN Mr. TOWNLEY'S ROOM.



MEMORIAL SCREEN IN FULBOURN ST. VIGOT.

FULBOURN MANOR, CAMBS.

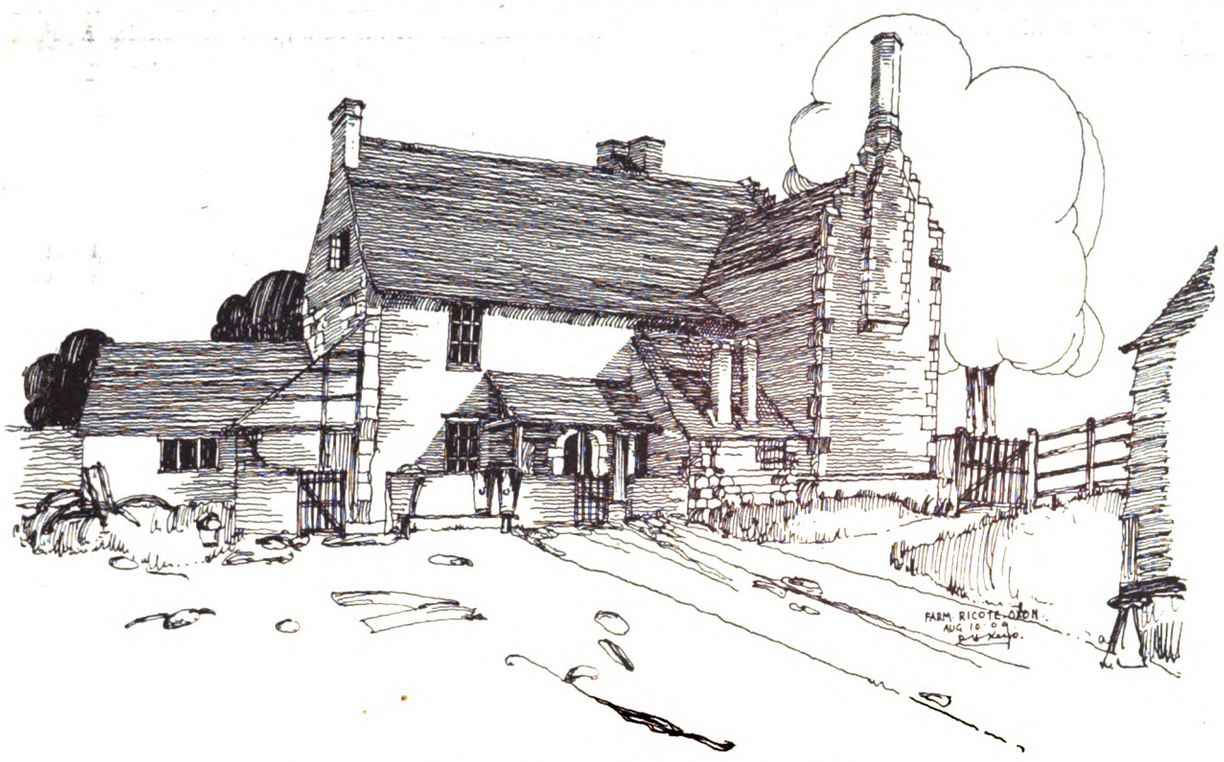
DUDLEY NEWMAN, F.R.I.B.A., Architect.

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RICOTE, OXON.—From a Sketch by P. HUBERT KEYS, A.R.I.B.A.

Ricote, Oxon, now a farmhouse, was at one time part of a fine mansion of the Tudor period, and once the home of the Earls of Abingdon.

THE ARCHITECTURE OF THE INCAS OF PERU.*

(Concluded from last week.)

WE shall now leave the region of Cuzco for that of Tiahuanaco, near the southern end of Lake Titicaca, about 300 miles away on the border of Bolivia. Here we find ruins which in a sense are more remarkable than those of Cuzco, because far more antique. The temples and fortresses of Cuzco date only from the beginning of the eleventh century, as stated, of the Christian era, when the Inca dynasty came to being; those of Tiahuanaco and others are of unknown age, and doubtless were built by the Aymaras at the time of their greatest culture before their overthrow. Some writers, indeed, have maintained that they were contemporaneous with Babylon or Assyria. But be that as it may, they are of a different type to that which the Inca stone-shaping art produced, and they form the ruins of the oldest city in the New World, here upon this high, bleak, sterile plateau of Titicaca, more than two miles vertically above the level of the sea.

The ruins of Tiahuanaco consist mainly of the outline of a great temple, shown by rows of upright monoliths, foundations, parts of stairways, a great stone doorway, and some colossal stone figures. It has been a question how these great monoliths were transported here, but if we take into account the hydrographic conditions of the site, which might have been formerly an island when Lake Titicaca was more extensive than even now, it is conceivable that they were floated to the spot, and possibly their quarries were nearer at hand than has been supposed. Indeed, quarry sites have been established in the neighbouring hills. But, on the other hand, some of these monoliths, both here and at Cuzco, have been transported for great distances over the most broken country imaginable, and their carriage presents the same question as has been aroused concerning the monoliths of Egypt. Near Cuzco is an enormous stone which has been abandoned on the road, and an Indian tradition says that the stone "wept tears of blood" at being left there. These great stones of Tiahuanaco, unlike the Inca walls, are often very richly carved. The most remarkable of them is the monolithic doorway of Akapana, with its carved figures, the central one of which has been taken by Peruvian archæologists to represent the mystic deity Huirakocha. Some of the lesser figures have human bodies, hands and feet; some human heads, others heads of condors; some wear crowns and carry sceptres, and they appear to be in an attitude of adoration of the central figure, which itself holds sceptres, carved with the heads of tigers and condors, which were probably symbolical of strength and power. This central figure of Huirakocha (or Varacocha) was the supreme god of the Andine people, typical of the "Abyss of the Waters," as was "Ea" among the Chaldeans. Among other notable monoliths of this group of pre-Inca ruins is a great stone image, about twice the height of a man, which stands upon the plain.

Upon the islands of Lake Titicaca there are other remarkable ruins, both Inca and pre-Inca. From this island it was that Manco Capac, the first Inca, whose virgin birth as a redeemer of man is part of the Inca mythology, set out to civilise the savage tribes of the Andes. There are many ruins on this island, as also upon that of Coati; ruined temples to the sun and the moon, the former of which the Inca worshipped as symbolical of a greater Deity. There was, indeed, much that was chaste and ethereal in the Inca religion. They imagined a Supreme Being, an "Unknown God," who pervaded everything but who could have no visible or tangible form or likeness; and they did not set up idols, nor were human sacrifices performed. The image of the Creator was represented at Cuzco by an elliptical plate of gold set on the wall of the temple. In the Titicaca region there is also a remarkable ruin, known as the "Temple of Huirakocha"—huge walls which probably were never completed; work of the Aymarans.

If now we leave this part of Peru and Bolivia and journey to the north some 700 miles—or about 400 from Cuzco—we reach the region of the Upper Marañon river, where we encounter several other beautiful examples of the Inca and pre-Inca stone-shaping art. Indeed we shall have passed other vestiges of their time upon the way, such as the monoliths of Huaitara, and ruins of prehistoric villages in many places. The modern capital of this region is the town of Huaraz, a typical Andine city, 10,000 feet above sea level, and overhung by the snowy Cordillera to the east. There are many vestiges of the Inca period here, but we shall cross the main range of the Cordillera; and one of the passes which I have traversed on various occasions is an old Inca pass of rock-hewn steps at an elevation of nearly 15,000 feet. We then descend to an affluent of the Marañon, upon which is situated the remarkable castle of Chavin. This castle, which I explored, is largely in ruins, but there are numerous singular underground chambers and passages, the purpose of whose construction it is difficult to understand. The walls are of blocks of hewn stone. But the main point of interest here is the singular carved monoliths, doubtless of pre-Inca origin, which exist or existed here. One of these, a beautifully-carved stone

* A paper read by Mr. C. R. Enock, F.R.G.S., at the last meeting of the Architectural Association.

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about twice the height of a man, was transported over the Andes and down to Lima, on the coast, where it stands in the Exhibition Park. Another in the form of a column yet remains in place, and there I examined it.

The whole of this remote region of the Upper Marañon is dotted with the ruined dwellings of the former occupiers of the land. Houses, streets, fortresses, sometimes in the most inaccessible positions, upon appalling crags, towards which the night-mists from the Marañon roll up in fleecy folds like a mysterious pall, and from them these ruined castles and walls start suddenly as we behold them, like the ghosts of the dwellings of a vanished race—which indeed they are—weird and unique. I have, upon my expeditions with my men and mules, often been obliged to sleep in these ruined places, sheltering from rain and snow, and my men have cooked the evening meal in the old fireplace of perished Inca chiefs. The disposal of these numerous ruins, often about a central fortress commanding the heads of valleys, and surrounded by the abandoned "andenes" or terraced fields of these people, goes to show that the inhabitants lived as clans, or "Gentiles," and their ruined dwellings are termed by the Indians of the Andes to-day "casas de los Gentiles," or "houses of the Gentiles." These "andenes," or cultivated terraces, are a most striking feature of the Andes. I have journeyed among these interminable slopes in many places, and at sunset especially the "andenes" come into view, giving a singular rippled appearance to the sides of the profound valleys. They go to show how every available foot of ground was cultivated under the Incas, who were splendid agriculturists, and how extensive must have been the population in pre-Hispanic times of these vast regions, where since the advent of the European, only scattered villages and mouldering ruins now exist. It has been calculated that the population of the Inca Empire might have reached 90,000,000 souls, but I consider this greatly over-estimated. It is not difficult, however, to conceive a people as numerous as that of Great Britain to-day.

The most remarkable group of ruins in this region is that of Huanuco Viejo, of which I made a special study. It stands upon a broad, flat plain upon an arm of the Marañon, at an elevation of about 12,000 feet above sea-level, and consists of an extensive palace, a fortress or temple of the sun, baths, and an extensive village of streets, with a singular series of round and square dwellings, alternating in long rows. The chief architectural feature of the buildings is a series of stone doorways, really beautiful examples of Inca masonry, and the castle or temple. In the palace there are six of these doorways, all standing in a line at considerable distances apart, so that the observer who takes his stand in front of one of them is enabled to see through the whole series. The line so taken through them is about east and west. The total length across the courtyards or halls to which these doorways give access is about 400 feet. The doorways are of typical Inca tapering or trapezoidal form, with quoins and lintels of beautifully-fitted stones of the more or less polygonal form previously described, and so closely fitted that a knife-blade cannot be inserted in the joints. No mortar has been used. The lintels are monoliths of nearly 7 feet in length in some cases, and the thickness is about 3 feet, which is that of the walls of which they form part. The characteristic niches, also of trapezoidal form, are a marked feature of the walls of these ruins.

The castle, which stands in the centre of what was a huge square, around which the palace or palaces are disposed, is a building of different character. It is rectangular in form, about 100 feet wide and 170 feet long, very solidly constructed of cut stone blocks surmounted by a cornice, whose moulding is composed of a fillet and cavetto, as in the Doric order. The whole plain in the vicinity is covered with the ruins of small habitations, generally of unhewn stone. All the masonry of these ruins is composed of blocks of silicious limestone, which have been extracted from a stratified hill at the edge of the plain.

This plain and its hills, and the ruins of the palaces, castles and dwellings are absolutely uninhabited, except for an occasional Indian shepherd, and these, I was informed by my men, occasionally vary that occupation by horse-stealing. I pitched my tent under the shelter of the palace walls, and in the night a commotion among my mules seemed to suggest that some prowling robber might be about; and as a warning I lifted up a corner of the tent canvas and fired a couple of revolver shots out into the night air. When morning dawned we found tracks of sandalled feet, but nothing was missing. I sketched the chief features of the place, and rode along the abandoned streets of the Inca village, where even as late as the time of the Conquest the Incas maintained a population of 30,000 souls. Now the wild oats waved above the entablature of the palace of the Incas, and the declining rays of the sun fell softly across the ruined walls as I ascended the range of hills above the Marañon. These ruins of Huanuco Viejo are of much interest, and as far as I am aware they had never been previously examined and depicted. My photographic films had become exhausted, and I have only my sketches to illustrate them, which, however, were made with exactitude. One remarkable fact we must recollect in regard to these great stone structures of the high plateaux—they are in a region at a vast elevation above sea-level where there is little vegetation, absolutely no timber, and where corn or other cereals will not grow.

We will now leave the high region of the Sierra and descend to the coast. The principal ruins of the Incas, pre-Incas, and other semi-civilised former occupants of the land, such as the Chimus, are mainly of buildings constructed of adobe, and have remained—where they have remained at all—due to the dry climatic conditions as before mentioned. The most famous of these ruins formerly was that of Pachacamac, which at the time of the Conquest was a splendid temple raised to the "Unknown God"; and great spoil of golden vessels and plates was secured from this place by the Spaniards in the ransom of Atahualpa. The name "Pachacamac" signifies in Quechua—the language of the Andine people—"He who gives animation to the Universe." To-day nothing remains of this great temple but a mound of rubbish, a day's ride from Lima. Proceeding along the coast-zone to the south we shall reach a group of ruins known as "Incahuasi," or "the house of the Inca." These, unlike the coast ruins generally, are of stone, although they lack the beautiful workmanship of the mural remains we have visited in the Andes. But they are unique in one respect—they contain a row of columns. This is an architectural feature absolutely unknown in the Inca and pre-Inca ruins elsewhere, for, except in this case, the column was unknown to the Andine people, as was the arch. The columns of Incahuasi are not monoliths, however. The building probably dates from the fifteenth century. Still further to the south, slightly inland from the port of Pisco, we encounter an extensive group of adobe ruins in a good state of preservation, consisting of long walls with characteristic trapezoidal-formed doors and niches, and corridors, halls and rough stone foundations. I took a careful sketch of these features. The niches are still coloured with some red pigment, possibly vermilion from the great quicksilver mines in the Andes to the east, for vermilion was obtained from the cinnabar to paint the faces of Inca beauties, we are told by Garcilaso, the Inca historian.

Still further south in this coast-zone of Peru I encountered remains of long aqueducts, a line traceable for 80 miles along the hill slopes, for the Incas were expert in hydraulics and irrigation works. There are other long ruined aqueducts in other parts of the country also.

Taking our way now far to the north, we come to the region where the Chimu people flourished, who were overthrown by the Incas. They were a powerful semi-civilised coast people, and numerous ruins attest their skill in mural construction. Among these the most notable are the ruins of Chan-Chan, whose walls show florid decorations, elaborated in cement. These ruins are not far from the modern city of Trujillo, and would repay careful study.

It would be impossible within the space of this paper to dwell at greater length on the ruins of the early Peruvians I have enumerated, and those others scattered throughout the land; and I must content myself now with a few general particulars. As we have seen, the Inca and pre-Inca architecture differ much, to those who have made a study of them. The first lack any iconographic carvings, such as we have seen at Tiahuanaco and Chavin. Monoliths of considerable size were common to both; one of those at Cuzco is 27 feet long, 15 feet wide, and 12 feet high, and there are others of almost equal size. The stones vary as to their geological composition according to the region; some are of granite, as at Cuzco, some of trachyte, sandstone, or basalt, whilst others are of a hard, silicious limestone. It is to be recollected that this remarkable stone-shaping art was performed without the use of iron; but the Incas possessed bronze, termed chumpe, and copper tools. Indeed, they were skilled metallurgists in copper, gold and silver. As previously stated, the Incas were unacquainted with the arch, but nevertheless they constructed dome or "beehive" roofs, both to their tombs, at times, and to their conical houses, whether of stone or adobe. They also employed the principle of corbelling-out over openings, and to form the abutments of small bridges. In general terms the principal characteristic of the Inca architecture is its great solidity. It would seem that the builders had desired to bequeath to posterity these chapters in stone of their history;

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and, indeed, it is safe to say that these may be expected to outlast any of the modern structures of America, whether the architectural work of Colonial Spain—good and solid as this is generally—or whether the evanescent skyscrapers of the Anglo-Saxon on the Northern Continent. Solid as these walls are, however, the roofs of the large buildings have perished long ago; as their builders do not appear to have been able to advance beyond sloping roofs of poles covered with grass thatch; or, at any rate, in the absence of anything else we can only assume this to have been the case. Their buildings, with small exception, are never of more than one storey. Nor were they acquainted with the use of burnt brick, although their ceramic art was an advanced one, as we know from the beautiful and abundant Inca pottery. In the shape of their vases (as well as in the form of some of their buildings) they showed a curious knowledge of acoustics. There were no doors to the houses, the openings being covered with a mat. The interiors of the temples were covered with plates of gold, of which the Spaniards secured great booty.

In conclusion, we will now cast a brief glance at the land system of the Andine people, which, in view of the present controversy in Britain regarding land tenure and small holdings, is of much interest. The land laws of the Incas were exceedingly philosophical. All the land was measured and surveyed; every available hillside was banked up and terraced, forming the "andenes" already spoken of; a portion of the land was set aside to be worked for the benefit of the sun, or let us say the Church; another portion for the Inca or the Government; whilst the bulk of it was portioned out among the people, each head of a family receiving his holding, with an added plot for each addition to his family. Everyone was obliged to work his holding, and destitution did not exist; nor was begging permitted, as every citizen was provided for and could support himself and family by his own crops and herds of llamas. Taxes were payable in goods, not money, and the whole system was a prosperous and beneficent one, under monarchs who had the welfare of their people at heart. Indeed, the organisation of land, food supply, and work, without waste or poverty, was so beneficent a one as has never existed under the rule of any Christian nation or monarch. The advent of the Europeans destroyed this promising system, and the only useful remainder which the poor dweller of the Andes inherits to-day from his Inca forbears is the system of land tenure, which is wisely perpetuated by the modern Government of Peru. That is to say, the small holding of the peasant is inalienable by law; so the Cholo of the Andes lives in undisputed possession of his little holding, wrested from rocks and thorns; but it is safe to say that he owes this security partly to its inaccessibility. Otherwise his land would doubtless have been snapped up long ago by the large landholders, after the custom of other American and European peoples. The social system of the Incas, whilst it had its excellent points in that destitution was impossible, did not tend towards social advancement, although what might have been evolved if the civilisation had not been destroyed it is impossible to say. Their social *régime* has been described as a species of Socialism, under a beneficent autocratic Government.

A few words as to the origin of the Incas and pre-Incas, and I shall have finished. I do not think anyone who has made a study of the matter will deny that the stone-shaping art and some other arts (not only of these people, but of the Mexicans, 3,000 miles away to the north) must have been inherited rather than evolved. More—the people themselves must have been immigrants originally, rather than autochthonous. But from where? The generally assigned origin is from Asia, and the Mongol cast of face is very noticeable among the pure indigenes both of Peru and Mexico. As to their arts, an origin has been assigned in Egypt and in Mesopotamia. We have seen the tendency to the pyramidal in the Inca structures, giving some atmosphere of the buildings of the Nile. A host of other analogies have been adduced. The use of copper tools, the custom of embalming the dead, for mummies are common objects in the Inca tombs; the Indian canoes of Lake Titicaca, with their turned-up prows and mat sails, which are the counterpart of such a craft figured on the tomb of Rameses II.; religious customs, including sun-worship and moon-worship; matters of design upon pottery and woven textures; the wearing of sandals; and, above all, their stone-shaping art and their transport of monoliths. Into this fascinating field it is beyond the province of this paper to trespass further. The theory of Asiatic or Egyptian origin has been strenuously denied and strenuously supported, and the approaching shores of Behring Straits, where America touches the fringe of Asia, have been pointed to as the probable path which these prehistoric immigrants followed, when, bearing in their bosom the germs of a civilisation and a religion from the ancient world, they passed down these 10,000 miles of Pacific littoral and inclement Cordillera of America. Well may we ponder on their mystery, as, standing amid the ruins of these bygone empires of the Andes, we watch the sun-god of the Incas sink in the Occident.

Mr. R. PHENE SPIERS complimented the author on the clear and distinct drawings which illustrated the paper, and which enabled them to recognise the main features of the buildings described. There seemed to have been two positions in which buildings were erected, and with different materials. Those in the lower valley constructed in adobe or sun-dried brick, and those on the highlands with stone and no timber, and the constructors did not seem to have the ordinary means of covering in a building. As regarded the origin of the people, whether they had any connection with the Babylonians or Egyptians must be left to conjecture, but he did not think the construction of their buildings was related to any particular country. Attention had been drawn to certain forms which might have been derived from Egypt, but the raking walls were a necessity of the building material. In the later works it was evident that earlier buildings had been copied, and it was quite certain that the sloping sides of the doorways could not have been derived from the structures erected with sun-dried brick, and they were probably used as the best means for getting over the difficulty of fitting too large a stone on the top. The question which occurred to him was, how did they cover their buildings? The lecturer had told them of roofs made of poles and covered with earth, but that was the fashion of to-day. He did not think it was derived from an Egyptian source any more than the beehive huts on the Irish coasts were. As regards the transport of materials M. Choisy in his books had shown them how such enormous blocks of stone were moved in Syria, but there was only slight information on the subject.

Mr. F. D. CLAPHAM seconded the vote of thanks, and said that as architects they had been most interested in the author's graphic description of the Inca buildings, constructed of masonry and with such peculiar skill that they seemed almost in accordance with the tremendous mountains surrounding them.

Mr. G. L. ELKINGTON said the impression which came to him was that the Incas and their architecture were somewhat over rated, for he could not help thinking that the examples they had seen erected under pre-Inca rule were far more interesting than the real Inca architecture.

Mr. H. W. BRITTAN also supported the vote of thanks, which was passed by acclamation.

TOWN PLANNING SYSTEMS.*

(Concluded from last week.)

THE typical irregularity of the streets of nearly all old cities is attributable to their gradual historical development, and their sometimes astonishing twists and turns may generally be ascribed to practical causes, such as the presence of an ancient way or watercourse. But it must be borne in mind that the irregularities of a plan which look so strange on paper are not necessarily disagreeable in actual execution, but often give an added interest or more picturesque effect to the street. Regularity of plan is by no means essential; St. Paul's Cathedral is on an entirely different axis to the line of Ludgate Hill, but the effect is certainly not diminished by this apparent accident of position.

With streets as well as with squares it is frequently desirable to "frame" or limit the view, and this is most generally achieved by forming a break or curve in the line of sight. The junction of Regent Street with Portland Place will serve to exemplify this, and the construction of quadrants and curved facades is another expression of this general feeling. With a strongly marked curve (such as the Quadrant in Regent Street) there may possibly be a tendency to irritation if the length is unnecessarily prolonged, but with a slightly curving frontage there is ample opportunity for a continually varying horizon, for a moving picture of continual charm. This is particularly the case where numerous objects or buildings of interest exist on the same line of route. The curved frontage of Fleet Street as one goes westwards with first the tower of St. Dunstan's Church, then the Law Courts, and the Strand churches beyond, will occur to everyone, and the noble sweep of the Thames Embankment undoubtedly owes most of its effect to the graceful curve which shows off its buildings to such splendid advantage. Imagine the difference if the river were confined between rigid walls of straight lines.

* A paper by Mr. W. R. Davidge read at the last meeting of the Surveyors' Institution.

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For a tree-planted street, a slightly curved line not too regular in form gives perhaps the most pleasing effect, and for suburban streets in particular this method of planning with its continual green vistas of trees is worthy of the utmost encouragement. The most successful of the garden suburbs have in many cases been designed on such lines—a maximum of garden, a minimum of suburb. Even in this case, however, the curved streets should not be overdone. Nothing is more bewildering to a stranger than to find himself in a labyrinth of streets curving in every direction except that in which he wishes to go.

In a town street a curved or irregular line of frontage may be made to provide just the spaces for cabstands, sandbins, public ambulances, telephones, fire escapes, fire calls, and the other conveniences which are so essential to the comfort of life in a modern city. In a less crowded street the continual change of view, due to the irregular frontage, helps to break the thoroughfare up into short sections; the foot traveller feels conscious as he passes landmark after landmark on his way that he is indeed making good progress, and presses forward with encouragement, very different to the unfailing weariness produced by a mile of straight road both on mind and body.

In modern towns irregularities of planning have not perhaps always been a success; their artificial character is too apparent, and in many cases the irregularities are simply cut-away plots of triangular shape produced in connection with street "improvements," or perhaps due to the parallel shape of plots forcing the houses into *échelon* formation. The crooked street of our forefathers is perhaps too crooked for modern ideas, but it should at any rate be possible for us to grasp some of the principles which consciously or unconsciously must have guided the men of the past. With the advance of sanitation, and the increase of traffic, we demand wider streets and more breathing space, but let us not aim at showing our superior wisdom simply by the extent to which we have developed the art of drawing straight lines. Straight streets are undoubtedly necessary for many purposes; if wisely used they give an air of stateliness and a sense of fitness and monumental grandeur, but the so often reiterated use of the rectangular or draught board pattern of street planning, without consideration to the shape or contour of the ground or to any other local circumstance, cannot but be regretted.

The width and general direction of the streets having been decided upon, there will necessarily be many important centres or points of crossing at which the traffic will be much heavier than in other parts of the town. At these points the difficulties of dealing with the traffic will naturally be increased, and it may perhaps be of service briefly to scrutinise a few of the methods that have been adopted to minimise the inconvenience and danger of thus concentrating the traffic.

The rounding off of all corners produces naturally the familiar form of circus, of which so many examples are to be found in London.

The introduction of a few more converging streets produces the *rond point*, so characteristic of the stereotyped form of town plan.

A more ancient method of dealing with the difficulty is by the construction of a small open square or market place, thus dispersing the traffic over a wider area.

If the levels admit, one thoroughfare may sometimes cross the other by means of a bridge, as in the case of Holborn and Farringdon Street, or in the manner suggested by Mr. Paul Waterhouse to the Royal Institute of British Architects in 1906, in connection with the proposals of the London Traffic Commission. Sir John Wolfe Barry, too, some time ago suggested a bridge over the Strand at Wellington Street. Such methods, however, by reason of the difference of levels and cost involved can only be for exceptional cases in which the traffic is sufficiently heavy to justify the outlay.

In this connection it may be interesting to note the suggestions recently made in a Report upon the street traffic of Paris. The suggestion is not so much a constructive one as for the regulation of existing traffic, and to enable two or more streams of traffic to cross at any angle without confusion. It is suggested that at important street junctions circuses should be formed with a central island of some size, the traffic being made to circulate solely to the left, or in one direction only. Some such system of traffic regulation is at any rate worthy of a trial, and with the assistance of the London policeman should not be difficult to carry out.

Many town councils both in England and on the Continent have been far sighted enough to purchase comparatively cheap land on the outskirts of their town for the purposes of public parks, and in many continental cities this system of land purchase by the local authorities has been utilised to secure for the community itself the profit from the continual expansion and consequent rise in land values. A system of municipal land speculation of this kind has many advantages for the community, but it is naturally open to considerable opposition from private landowners.

However this may be, parks must always be provided for the public, and these should be in as easy communication as possible with the most congested portions of the town. The presence of a park in itself tends to improve the whole of the surrounding property, and naturally the better class of houses will be found in close proximity to such breathing spaces.

It is not too much to say that public gardens or tree-planted spaces are a vital necessity for the health and well-being of the community, and there can be no question that the beauty of a town is greatly enhanced by the presence of a sufficiency of trees and well-kept gardens. Ample space should also be provided for the purpose of playgrounds for the children, and these should be of a pleasant character and something more than gravel or asphalte wildernesses.

A point that is not always borne in mind in designing squares or open spaces is the proportion which the space should bear to the surrounding buildings, and particularly to the dominating building which is to abut upon it. The charm of the older cities was in hardly any case obtained by the use of large open spaces; their pleasing result was attained by a judicious grouping or arrangement of comparatively small spaces. Sitte states that in front of a building such as a church of considerable height in proportion to its breadth, in which the "vertical" note predominates, the "place" or open space should be *deep* and narrow, while in front of a long façade such as that of a town hall or other building of considerable length the open space should be *wide*, rather than deep. Experience shows, he says, that the minimum dimensions of a "place" should be equal to the height of the principal edifice fronting thereon, and that its maximum dimensions ought not to be more than double such height.

Another point which he emphasises from an artistic standpoint is the necessity, particularly in the case of squares or open spaces, for closing in or "*framing*" the view, so that the buildings appear to be continuous.

In many of the older cities it will be found that the streets and thoroughfares communicating with open squares or "places" do not run directly into the centre of the open space as in so many modern plans, but rather enter one end of it. In others the "place" is artificially enclosed by colonnading or entrance arches, to form a closed-in view.

No paper on town planning would be complete which did not touch upon the possibilities of improving the great collection of towns which we call London. The London Traffic Commission a year or so ago deliberated upon the peculiar difficulties which beset London, and with the passing of an Act dealing with the subject of town planning it is possible that some considerable alleviation may be effected in the present conditions of traffic congestion.

The first necessity is for co-ordination of effort among the many authorities in whose tender mercies the hapless Greater London is situated. Some such co-ordination should be possible under the direction of a central authority invested with sufficient powers. Given such co-operation, the next thing is evidently to take stock of our present advantages—our parks, open spaces, water-courses, commons, and country lanes and main highways, and to make all such assets as accessible and convenient as possible. Of garden suburbs we have already a few, but they need to be increased in all directions.

In parks and open spaces London is apparently well provided, but many of these are concentrated in the better-class neighbourhoods, and whole tracts of bricks and mortar still exist with hardly a tree-planted street, and only an occasional spot of green grass in the shape of a disused burial ground. In North London we have Regent's Park and Hampstead; in East London there is Victoria Park. These make a good show on the map, but they are within reach of a proportion of the people only. Meanwhile areas which might be utilised as public parks are steadily absorbed by factories and rows of mean streets, each individual owner naturally striving to make his land return as much as possible by crowding the bricks and mortar as closely as building acts will allow.

Let us consider for a moment what sort of improvements are reasonably practicable. It is comparatively easy to plan an ideal city if "ways and means" have not to be considered, but in another sense it is just the existing "ways" and "means of communication" which must be considered and utilised to the fullest extent.

Apart from the question of improving and widening many of the existing roads out of London, and of providing new routes where necessary, one of the first considerations should

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undoubtedly be to bring the larger parks and as many other green open spaces as possible within easy reach of all sections of the community.

We do not make half enough of our present assets, and with expert assistance, such as can be readily given by members of our own and kindred professions, there will be innumerable fields for the beautifying of London.

The Regent's Canal is in many places one of the most beautiful of London's ways, but it means little, if anything, to the thousands of Londoners who catch but a glimpse of it from the top of an omnibus over the parapet of a high-walled brick bridge, or through the chinks of an advertisement hoarding. What a glorious series of shady walks might be made by its banks with a little thought, a little sacrifice.

Very few great cities are more finely situated by nature than London, if we could but realise it. Both on the north and south it is girdled by hills, and the broad expanse of heath at Hampstead and the hills of Sydenham and Forest Hill are splendid fringes for a splendid city.

On the east and west we have already an almost continuous chain of truly beautiful parks, and yet the main roads lined closely on each side by houses in many cases thread their way through the closely built area between the parks, almost within reach, yet entirely out of touch with the green grass and green fields. Nine-tenths of the passengers on tram, or bus, or tube are entirely oblivious of the parks so near at hand, and, although they may perform the same journey day after day for years, have neither the time nor the inclination to go a hundred yards to see the parks so thoughtfully provided by an earlier generation. The remedy is clearly to open out all such parks so that they can be appreciated and utilised to the fullest possible extent.

London has also been fortunate in the past in taking advantage of the little hills and valleys which exist in her very midst. St. Paul's owes much of its effect to the height of Ludgate Hill on which it stands; the Valley of the Fleet, Notting Hill, and other natural beauties within the area of buildings will occur to everyone. One and all emphasize the necessity of taking the fullest advantage of every rise and fall of the ground.

No planning, however, can hope to be of real service in beautifying our cities unless the architecture of the buildings is in accord with its needs and worthy of its purpose. Some efficient architectural control there must be, but at the same time it is evident that in England at any rate as free a hand as possible should be given to individual tastes. With our present methods this may appear well-nigh impossible, but with a better and more general appreciation of the art of building it would not be an impossible idea to reconcile these conflicting schools.

Although perhaps in the central and more important areas it may be necessary to require buildings to be to a strictly regulated and restrained design, in the outskirts there is no reason why much more latitude should not be allowed for individual ideals. The garden suburbs, which have been formed in various places around our great cities, are many of them delightful in their planning and surroundings. Port Sunlight near Birkenhead, Bourneville and Harborne near Birmingham, the Hampstead Garden Suburb, and many other model estates in the neighbourhood of London, all testify to the advantage of such suburbs, combining as they do the beauty of the country and the facilities of the town.

The Bill now before Parliament provides for the town planning scheme to be prepared by the local authority, such scheme, when approved by the Local Government Board, to have effect as if it were enacted in the Act.

The preparation of such a town plan will in the ordinary course of events be the work of a committee or commission appointed by the local authority or authorities concerned, and it is to be hoped that they will have the advantage of skilled expert advice. It may be interesting to compare this with the practice that obtains in German towns under the magisterial system.

The Mayor or Oberburgermeister is under this system elected for a long period of about twelve years, and he is assisted in his functions as head of the executive by a Cabinet of a select number of special councillors, also elected for a term of years. Practically the whole of the town government is in the hands of this paid Cabinet or "Magistrat," and they have the advantage of expert advice from the city architect, engineer and medical officer. In the preparation of town plans it is also customary to consult one or other of the leading professional men of the country, who have built up reputations as specialists in this class of work.

In England it is evident that the preparation of a scheme so vitally affecting the future of a town must not be left entirely to a committee composed of butchers and bakers, however well meaning, or of property owners or others who have their own axes to grind. The best advice obtainable must be secured and this will no doubt be readily and cheerfully given by surveyors, architects, valuers and all concerned with the material advancement of the town. The further submission of the completed scheme to the Local Government Board will ensure that a fair hearing is given to all objections raised and that the proposal is as free as possible from objectionable features. Whether it will also ensure that the scheme shall contain a sufficiency of sites for public buildings, gardens, parks, open spaces and similar amenities remains to be seen.

The acquirement of property required for these purposes and the compensation to be paid in a general scheme for redistribution of land would in themselves form ample material for an interesting treatise, and I do not propose to go into these questions which are somewhat outside the scope of my Paper.

Mr. LESLIE R. VIGERS moved a vote of thanks to Mr. Davidge for his paper. He said the general tendency of legislation relating to building was nowadays too much centred in Government Departments and borough councils. They suffered from what he termed a two-foot rule of the Building Acts, and were quite in the hands of the Local Government Board officials and without any chance of appeal to an authority outside. There was, of course, the appeal to the Tribunal of Appeal, composed of men who were in practice and able to bring independent minds to bear upon the subjects put before them, but he maintained there was too much of the two-foot rule interpretation of the Acts and he was afraid that in future years there would be trouble when they had to re-arrange their suburban towns.

Mr. HENRY LOVEGROVE seconded the motion and referred to the inclination of the present day to take people away from the centre of London. Such schemes were all very well from one point of view, but the trading interests in the centre suffered.

The PRESIDENT, in putting the vote of thanks to the meeting, said it was felt by the Council that as another paper on the Housing and Town Planning Bill was to be read before the Institution on January 10 next, it would be well to adjourn the discussion of that evening's lecture and take the discussion of the two papers together on January 24.

Mr. WM. WOODWARD formally proposed the adjournment of the discussion until January 24, and the motion was unanimously adopted.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

THE third general meeting of the Society was held at the Rooms, Park Street, Leeds, on Thursday evening, November 25, when, after the usual preliminaries, the President, Mr. Percy Robinson, F.R.I.B.A., called upon Mr. Martin Shaw Briggs, A.R.I.B.A., to deliver his lecture on "An Unknown Italian City."

Mr. Briggs, who has been recently appointed an Extension Lecturer to Oxford University, thereupon introduced his "unknown city" as Lecce, the capital of the "heel" of Italy. This district, it would appear, although perfectly situated as regards railway service, has been completely neglected by tourists hitherto, and it was only by chance that the lecturer was invited by the editor of the *Architectural Review*, to visit Lecce in the spring of 1907, and to write for him a series of illustrated articles on its reputedly interesting buildings.

So much material, interesting both from architectural and historical points of view had Mr. Briggs found, that he decided to write a more extensive monograph, to be profusely illustrated, on the city and district, and to appeal to the general public under the title of "In the Heel of Italy." From the chapter of this book dealing with architecture, the lecturer drew the substance of his paper.

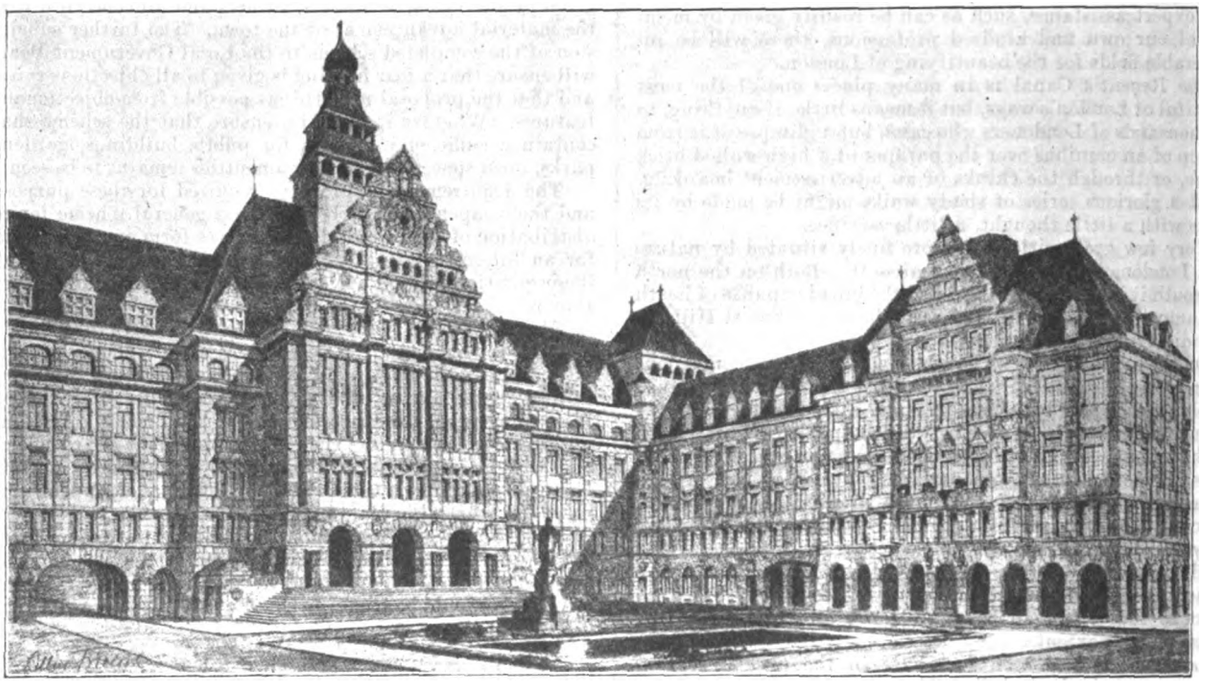
Carefully tracing the historical causes, he pointed out the influences at work in Italy and particularly in Southern Italy, contributing to produce a remarkable architectural period in this remote city, at a time almost synchronising with the career of Sir Christopher Wren.

He discussed the suitability of the term "baroque," as applied to the building of this period; compared its characteristics in Lecce and better-known cities, pointed out its strong points and its more obvious defects, and urged the rare charm of a complete baroque city.

Early examples of the middle of the sixteenth century varied in Lecce from a comparatively pedantic style to an extravagance of grotesqueness, far from pleasing, but in the later period a more settled style became noticeable and it is

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



DESIGN FOR RATHAUS AT BARMEN.—Albert Froelich, Architect. [From *Berliner Architekturwelt.*

this epoch to which Lecce owes the majority of its buildings. The details of this phase of architecture were noticed and some account given from contemporary writers, illustrating life in Lecce during the early eighteenth century.

Mr. Briggs remarked in conclusion that he regretted having to limit himself to architectural matters that evening, as he had found so much of interest in the history and in the people of this remarkable city and district. He commented upon the fact that although a place of considerable importance and within easy reach of Brindisi, the inhabitants regarded an Englishman with great curiosity, and amused his audience by confessing to having been arrested near Lecce as an Austrian spy.

The lecture was illustrated by some thirty lantern slides, mostly of architectural subjects, of which the greater number were prepared from the lecturer's own pen and ink drawings, many of them being of beautiful little palaces and street views so characteristic of this city.

At the close a cordial vote of thanks was, on the motion of Mr. W. H. Thorp, F.R.I.B.A., seconded by Mr. A. E. Kirk, A.R.I.B.A., accorded to Mr. Briggs. In proposing, Mr. Thorp remarked on the tendency of much of the work now being carried out in Rome to follow on the lines of the later baroque, while Mr. S. D. Kitson, F.R.I.B.A., accredited the lecturer with having entered a strong plea for this much maligned style, a sentiment which was approved by the majority of those present.

THE PRESENT ASPECT OF ELECTRIC LIGHTING.*

WHEN we wrote our paper on "Electricity Supply and Metallic Filament Lamps," which was read before the Institution in April 1908, the wire lamp had but recently appeared on the horizon, and there was general uncertainty as to what was likely to be its effect on the electric lighting industry.

At that time the 200-volt wire lamp was non-existent—indeed, one authority in a subsequent paper spoke of it as highly improbable, if not impossible—the smallest tungsten filament lamp obtainable for 100 volts was 25 c.p., the list price being 4*s.*, and but few people had resorted to the expedient of putting in a transformer to reduce the voltage to 25, which was the highest voltage on which a 10-c.p. lamp could be used.

* Abstract of a paper read before the Institution of Electrical Engineers, by Mr. H. W. Handcock and Mr. A. H. Dykes, members.

Two years have elapsed since the paper was written, and it occurs to us that it may be of interest to members to review the position to-day to see what the actual effects of the introduction of wire lamps have so far been, whether the fears expressed by some have been justified, and whether new factors are being introduced which may tend still further to modify the previous condition of affairs.

The first thing that strikes one is the extraordinary progress made by the lamp makers in the interval.

The manufacturing difficulties which led to blackening and premature failure have been almost entirely overcome, the methods of attachment and of supporting the filaments have been improved, and, apart from mechanical damage, the useful life of the lamps has now been proved to be, on an average, about double that of carbon filament lamps.

Two years ago the best that a consumer on a 100-volt circuit could do was to replace an 8-c.p. 33-watt carbon lamp with a 25-c.p. wire lamp, taking about the same amount of energy and costing 4*s.* each.

To-day he can, if he wishes, replace the 8-c.p. 33-watt carbon lamp by a 14-c.p. wire lamp, taking only half the energy and costing 2*s.* 9*d.*

So far continuous-current stations supplying at 200 volts have not been much affected, but at least one well-known maker has now succeeded in producing a 16-c.p. 24-watt lamp for 200 volts, which we are informed will be on the market very shortly at the price of 5*s.* We have had some of these lamps in actual use for some months past, with very satisfactory results. When it is stated that the diameter of the filament is only $\frac{1}{2500}$th of an inch and its length nearly 40 inches, one cannot fail to be struck by the skill of the lamp makers. Even this does not represent the limit, as we have seen in operation a 10-c.p. 200-volt lamp taking only 15 watts.

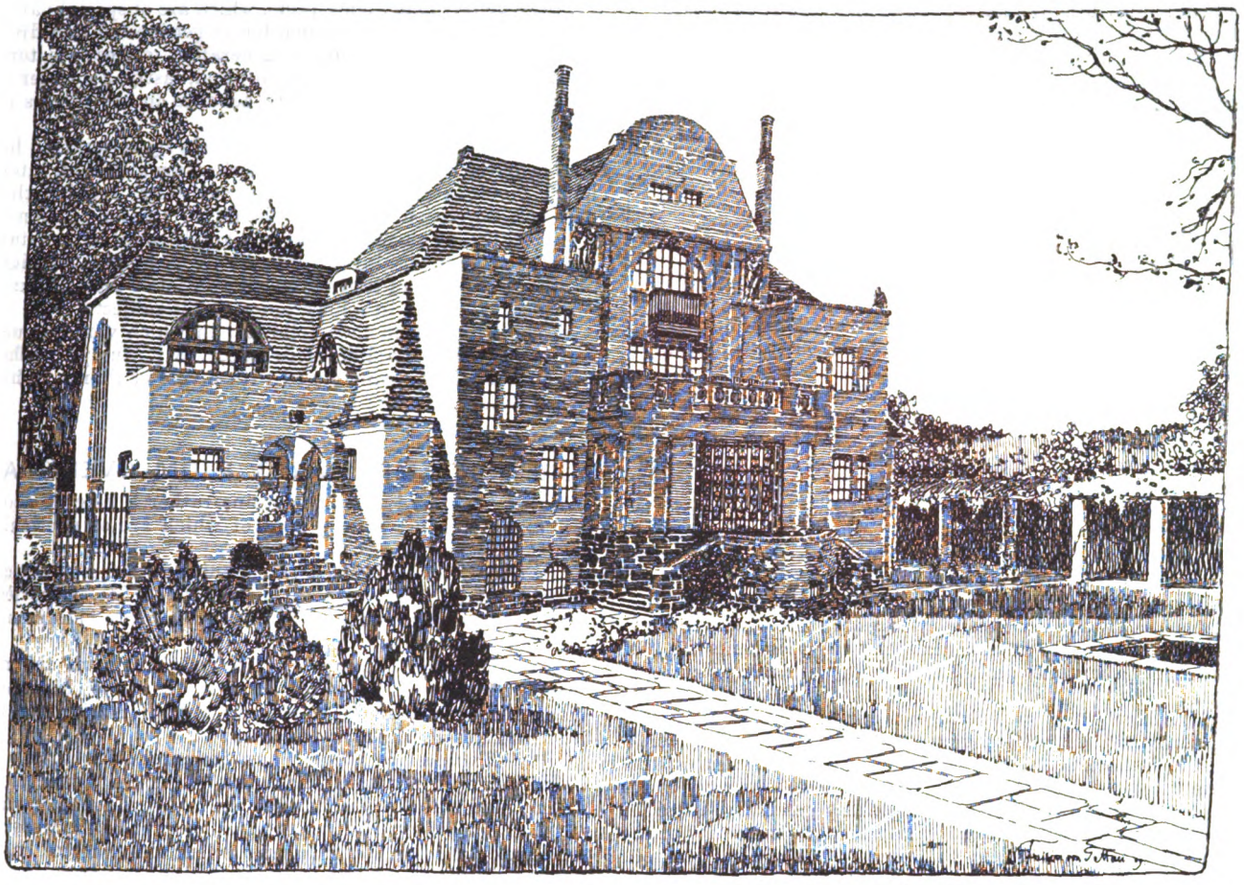
Past experience suggests that the price will before long be reduced, when there will be nothing to prevent consumers on direct-current 200-volt systems from following the example set them by those on alternating-current systems and obtaining the same candle-power as with carbon filament lamps, but with a consumption of less than one-half of the energy.

It is evident that whatever has been the effect of the wire lamp on supply stations during the last two years, it will be greatly intensified in the near future.

In our 1908 paper we ventured to suggest that the effect on those stations relying on a purely lighting load—and there are still a very large number of them—would be disastrous unless some steps were taken to alter the method of charging. We suggested that a fixed charge should be made, based on

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



[From *Berliner Architekturwelt.*

AN ARCHITECT'S HOUSE AT LANKWITZ.—WILHELM BARON VON TETTAU, Architect.

the maximum rate of supply contracted for by the consumer, which we termed his contract demand, and in addition a small charge per unit to cover the running costs.

It appeared to us that although the increased cheapness of the light, due to the new lamp, would attract new consumers, their numbers would not be sufficient to counteract the reduced demand of the original consumers, nor would the amount they individually contributed on a flat-rate basis be sufficient to cover adequately the cost of additional services and incidental standing charges.

The results of the past two years have only served to strengthen us in our belief that the flat-rate system fails to meet the conditions that now obtain, and that only by the adoption of some system which secures to the undertaking a definite minimum return from each consumer, based on the rate at which he contracts to take energy, can purely lighting stations be profitably run.

Experience has shown that on the average consumers have reduced their consumption even where they have somewhat increased their illumination, and the revenue received by the station per lamp connected has consequently fallen very considerably.

We assume that in most cases a 25-c.p. 30-watt metallic filament lamp will satisfactorily replace an ordinary gas burner such as is normally in use. It is true that with a photometer a mantle when new will, under certain conditions, show possibly 60 c.p.; nevertheless, experience shows that with few exceptions the average man is quite satisfied with the 25-c.p. metallic filament lamp for indoor domestic purposes.

The cost of lighting is judged by the everyday user not by the nominal candle-power of the illuminant, but by the total cost of obtaining a satisfactory effect in a room. If, for instance, a 25-c.p. lamp lights a room adequately for a given sum per annum, a consumer would not thank you for saying to him, "I cannot give you a steady 25-c.p. lamp for that sum, but for a somewhat higher figure I will give you a gas lamp fluctuating from 60 c.p. downwards."

For domestic purposes the 25-c.p. electric lamp is a satisfactory unit of illumination, and if it is more economical than the so-called 60-c.p. gas-light the consumer will take it. Given a proper method of charging, we are of opinion that not only can this be done, but in such a way as to prove very remunerative to the electric light undertaking.

With the flat-rate system of charging, the long-hour consumer at present uses gas. One reason for this is that owing to the loss made by the electric light undertaking on the short-hour consumer it is necessary to keep up the price all round, and the competitive illuminant benefits.

One frequently speaks as though it were an absolute necessity to supply every consumer in an area, regardless of whether he be profitable or not. In our opinion the very short-hour consumer, from the nature of the problem, can never be a remunerative one to an electric light undertaking on the present flat rates, as the capital outlay to supply him is very nearly the same as for a long-hour consumer.

Let, therefore, such a consumer go if he will not pay his fair contribution to the cost of supplying him; let him use gas or candles, and let us concentrate our efforts on the long-hour man, who gives us a greater number of working hours over which to earn interest on our capital.

At the moment it is generally the other way round, and electricity is given the unremunerative short-hour lamps because the present tariffs make the cost of long-hour lamps too high.

Under an equitable tariff the cost of short-hour lamps to the consumer might possibly be increased, but long-hour ones would be greatly reduced. This might perhaps result in the loss of some consumers who at present do not pay their proper contribution, but would be no detriment to the undertaking, which could then utilise the plant thus freed in supplying the great influx of long-hour gas consumers, who would be attracted on the score of economy, apart from any other advantages.

The difference in cost is so little and the business advantages, from the point of view both of the station and the consumer, of a fixed charge are so great, that we consider it preferable to make a fixed charge per lamp per annum,

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irrespective of the number of hours during which the lamps are used.

It obviously does not pay to go to the expense of putting in a meter, providing a staff to read it and keep it in repair, and a staff of clerks to make out the accounts, in order to check such small variations in revenue, more particularly if the relative importance of the standing charges be still further increased by the station supplying the interior wiring.

(To be concluded.)

THE CONCRETE INSTITUTE.

A MEETING of the Concrete Institute was held on Thursday of last week at the United Service Institution for the purpose of hearing a paper by Mr. R. L. Humphrey, of Philadelphia, U.S.A., on "Some Points Relating to Reinforced Concrete as Applied in the United States." The chairman, in his opening remarks, said that their membership was now 855.

Mr. Humphrey, having mislaid the bag containing the manuscript of his lecture, was only able to treat his subject in a general way, but a large number of slides were thrown on the screen. He said that in the course of his work he had visited nearly all parts of America and Canada, and during the last few months he had been to the principal cities of the Continent. The more he saw, the more convinced he became of the great future that awaited concrete. As a material it was, of course, hundreds of years old, but the concrete that was produced to-day was superior in every way to that of the Romans. It was only necessary to watch the production of Portland cement to realise that the improvements in the process of production go hand in hand with the wider uses of it.

Mr. Humphrey said that, comparing Europe with the United States, he had been much struck by the fact that while over here there was in the aggregate a great amount of concrete used, yet there was by no means the same variety in its applications as in the States. Speaking generally, it might be said that its scope was only limited by the ingenuity of the constructor. A great deal still remained to be finally agreed upon in connection with it. There was need for a more intimate knowledge of such important matters as the working stresses, the behaviour of concrete under stated loads, how the reinforcement should be introduced and of what character it should be, the durability of the material and its ability to withstand corrosion, and so on. These and other questions offered a wide field for investigation. Even so simple and elementary a matter as the mixing of the concrete was the subject of most opposing views. It might be said, therefore, that one of the leading functions of such a society as the Concrete Institute was that of an educational body. It was nothing short of marvellous that despite such radical differences of treatment the material had been employed with such almost invariably good results.

It was noteworthy that the problems that vexed them in America, and which were the fruit of doing things rapidly, were just as apparent in Europe, where things were done much more slowly. The one important thing for which all concrete users should strive was standardisation, whereby all that was known about it could be crystallised and taken advantage of by all, thus saving a vast amount of useless and unnecessary work.

One of the greatest obstacles in the path of its full development was the lack of preparatory education possessed by the average architect concerning the material. Architects were as yet unable to think in concrete; they had been brought up in an atmosphere of stone, brick, terra cotta, and other time-honoured materials. When they employed concrete they were called upon to use a passive material that does not lend itself to the customary rules of design. It was scarcely yet realised that concrete was one of the finest materials for construction, or that it could be moulded by the architect to suit his will. One of the things, however, that had struck him most during his visit to Europe was the much more artistic manner in which it was employed than was to be seen in America. Indeed, he would return there with the conviction that there was an even greater future than he had before credited awaiting the material.

A succession of coloured and other slides showing American examples were then shown upon the screen, in connection with each of which Mr. Humphrey made interesting comments as to the particular application of concrete. The series opened with a small foot-bridge erected at a time when the material was generally distrusted; the progress of the material was then traced through successive stages. The views included subways for foot and railway traffic; railway sleepers, with the rails resting on wooden cushions to minimise the concussion; cement pipes; canal banks in connection with great irrigation works; water tanks; cold stores; docks; concrete piles 60 feet long; fence posts, which are of special value alongside railroads where wooden fences get ignited in a fire; cowsheds and farm buildings generally; stores; factory chimneys; grain silos; street paving; and, lastly, a number of residences which showed a steady advance in the powers of design.

Mr. Humphrey wound up his remarks by reiterating his belief as to the importance of standardisation and of an interchange of views among the various countries, arguing that there was no reason why there should be greater differences of method among them all than in a single country. A start might be made in obtaining common agreement as to the right and the wrong way of testing cement. A lot of deep thinking remained to be done in connection with the subject.

A short discussion then followed, in which various questions suggested by the slides were asked. Mr. Humphrey then replied, and the meeting closed with a vote of thanks to him for his lecture.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* contains rather a heterogeneous series of illustrations, none of which are of particular beauty.

La Construction Moderne, continuing its series of articles on Old Paris, now deals with the hill of Ste. Geneviève. Further illustrations are given of the post-office buildings on the Cité Martignac.

Deutsche Bauzeitung describes and illustrates the new Town Theatre at Hildesheim, of which Professor Max Littmann is the architect. The account, with illustrations of the new Rathaus at Rixdorf, is continued.

The Engineering Digest has an interesting article on "Mahogany," telling us how and where the timber is obtained, and other facts connected with its production and use.

The Scientific American has an account of the treasures of Greek art recovered from an ancient ship wrecked on the coast of Tunisia and now being housed in the Bardo Museum at Tunis.

GENERAL.

The Founders' Company, one of the ancient City guilds, is arranging once more to hold an exhibition (which will be opened by the Lord and Lady Mayoress) in London on June 7 and 8 next year of castings and models in metals—viz. aluminium, bronze, brass, gold, iron and silver, also of designs in wood, plaster, and any other suitable material for casting to be competed for by founders, designers, craftsmen, apprentices and improvers, British-born subjects engaged in foundry business or its allied trades. Monetary prizes as well as certificates and medals will be awarded.

The President and Council of the Royal Academy of Arts announce that on the 14th inst. they will elect a Turner annuitant and a Redgrave annuitant. Applicants for the Turner annuity, which is of the value of 50*l.*, must be artists of repute in need of aid through the unavoidable failure of professional employment or other causes. Applicants for the Redgrave annuity, which is of the value of 35*l.*, must be painters in oil or water-colours, who shall have been exhibitors at the Royal Academy, and be in want of pecuniary aid from age or sickness. Forms of application must be filled in and returned on or before December 10.

The Royal Sanitary Institute will hold their annual Congress and Health Exhibition in the Royal Pavilion, Dome and Corn Exchange, Brighton, from September 5 to September 14, 1910. Intending exhibitors should obtain full particulars at the Parkes Museum, 90 Buckingham Palace Road, S.W.

The Local Government Records and museums committee of the London County Council report that during the excavations in connection with the construction of the Hackney Wick relief sewer extensions a very interesting discovery of prehistoric remains has been made. The remains consist of bones which have been identified as belonging to the mammoth and an extinct form of rhinoceros. They were found along the line of the sewer between the Great Eastern Railway (Chingford branch) and Roding Road, Homerton, at varying depths in the gravel overlaying the blue clay. In view of the nature of the discovery, a brief statement on the subject is to be prepared with a view to its being sent to public elementary schools in the district.

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The Architect.

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FORTHCOMING EVENTS.

Friday, December 10.

Architectural Association: Paper on "Varallo, Orta and Varese," by Mr. F. C. Eden.
Royal Academy of Arts: Distribution of Prizes to the Students.

Saturday, December 11.

Institution of Municipal Engineers: General Meeting at the Caxton Hall, Westminster; Dinner at the Gaiety Restaurant.

Monday, December 13.

Royal Institute of British Architects: Paper on "Architectural Education in America," by Professor A. D. F. Hamlin.

Wednesday, December 14.

Conference on Housing and Town Planning Bill at the Westminster Palace Hotel at 10 A.M., arranged by the National Housing and Town Planning Council. To be continued on Thursday.

Thursday, December 15.

Junior Institution of Engineers: Paper on "The Design and Maintenance of Cement Works," by Mr. H. Horsburgh.

THE SCULPTURES OF CHARTRES CATHEDRAL.

AS a museum of the best that French sculpture allied with architecture has given us from the twelfth to the eighteenth century, there are few buildings that will vie with the cathedral of Chartres. To the student of iconography also this cathedral is a mine of wealth, and hence we welcome an excellent collection of photographs,* the aim of which is, in the words of the authors, "to illustrate the cathedral on a scale hitherto unattempted." The prosecution of this aim has given us a fairly complete presentment of the sculptures of the west, north, and south portals, with some examples of typical sculptures and treatments of the buttresses of the cathedral, and some illustrations of the later work from the sixteenth to the eighteenth century of the choir screen.

The authors tell us that "the illustrations being the end and object of the book, the text only aims at elucidating them, explaining the subjects as far as they are known and giving their symbolic interpretation, with reference to the most recent and authoritative writers." This may be a modest way of expressing the authors' aim, but the manner in which they have accomplished that aim by their careful selection from the work of those who have written exhaustively on the sculptures of Chartres renders their work a valuable text-book for the primary study of mediæval iconography and architectural sculpture.

As VIOLLET-LE-DUC points out, architectural sculpture is commonly held to embrace two distinct branches: statuary and the sculpture of ornament, or, as we generally nowadays should call them, sculpture and carving. Chartres teaches us the lesson that the distinction is a false one, and that if works of sculpture are to be indeed part of the building and not mere exotic additions from a studio, the distinction between sculpture and carving must no longer be maintained, but both must become part of the architecture.

There is all the difference in the world between an alliance of architecture and sculpture in which the former provides a frame that the latter fills, even if it be filled adequately and sympathetically, and the union—one might say fusion—of architecture and sculpture as seen in the portals of the cathedral of Chartres.

Nowhere in the history of art has this union been more completely exemplified than in the buildings of the twelfth and thirteenth centuries of Western Europe, and amongst these buildings the foremost place is taken by Chartres for the essentially architectonic character of its sculpture.

The twelfth and thirteenth century work at Chartres has sometimes been compared with and placed beside the Greek productions of the days of PERICLES, but admirable as is the sympathy and harmony of the sculptures of PHEIDIAS with the architecture of ICTINUS, one must always feel that the tympana, the friezes and the metopes of the Parthenon are the frames in which plastic pictures are set. It is not so at Chartres; there the sculpture is not part of the architecture or an added ornament, but it is the architecture.

That the architectonic character of the figure treatment at Chartres was intentional and not accidental is, we think, sufficiently manifest. Though the treatment of the drapery of the figures on the west portal has much in common with Byzantine work, and they may even be said to be, in the words of VIOLLET-LE-DUC, "profondément pénétrées de la tradition Byzantine comme faire," the fact that the habiliments of the figures are distinctly those of the time, and the features are manifestly portraits, is sufficient to prove that the artists were capable of a different treatment of the pose and lines of drapery had they not been convinced that the quasi-Byzantine mode was that which best accorded with the spirit of their architecture and rendered their sculpture so essentially part of the building.

It is well to note that architectonic character of figure sculpture does not connote a conventional or even ideal type of face, for although the figures of the thirteenth century work in the north and south porches have this peculiarity, those of the earlier work in the west portal are, as we have said, manifestly portraits, yet the sculpture of this portal is as essentially architectonic as that of the later work. The conventional treatment of pose and drapery is sufficient in itself to give the desired character. On the other hand, it is not necessary that the drapery treatment should follow the Byzantine manner, for that of the north and south porches has progressed beyond the limitations of the twelfth century and yet has not lost the architectonic character.

That there should be no hard line of demarcation between sculpture and carving is a lesson taught by the beautifully-wrought small shafts of the west portal of Chartres, and this not merely because they combine figurework with conventionally treated foliage, but because one cannot conceive that the unity of the whole composition was possible with any separation of the craftsmen who executed such work into two distinct trades or arts of the sculptor and the carver. Nor do we find the distinction introduced in the later work of the north and south porches. One cannot, even if one

* *The Sculptures of Chartres Cathedral.* Text in English and French. By Margaret and Ernest Marriage. (Cambridge: At the University Press. 12*s.* net.)

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would, say where the work of the carver stopped and that of the sculptor commenced. Such distinction is only possible whilst the carver is a man set to reproduce with more or less fidelity the stock patterns of architectural ornament handed down from the work of the past, and the sculptor is an artist who is commissioned to fill a frame provided for him by the architect. Such an arrangement may lead to an alliance between sculpture and architecture: it can never bring about their union as exemplified in the cathedral of Chartres.

In the work of one of the greatest, if not the greatest, of our modern sculptors, ALFRED GILBERT, we see the abolition of the distinction between sculpture and carving. GILBERT'S figures are not framed by carving; the non-figure work is as much a part of his composition as the figures themselves, and so it is with the sculpture of Chartres.

Another notable feature of the cathedral of Chartres is the didactic character of its sculpture. Mr. FRANCIS BOND in his monograph on Westminster Abbey has laid it down that "the fact is—and unless it is grasped it is impossible to understand Westminster or any of the greater churches here or abroad—they were built not for man, but for GOD; and they were built for quiremen and not for the general public." The truth of this assertion it is impossible to admit when we stand in front of the portals of Chartres, and note the excellence and completeness with which the iconographic scheme teaches the fundamental doctrines of Christianity as then promulgated, the lessons of sacred history both of the Old and the New Testaments, of the examples of Saints and Martyrs, of the moral virtues and vices of everyday life. Were all these lessons set out so forcibly for the glory of GOD or the enhancement of architectural beauty and not for the instruction and admonition of the laity? Were they not rather intended for a perpetual reiteration visible to all of the teaching that was one of the functions of the Church within?

Even though at the present day the use of iconography as a method of instruction has so far declined that it is not always clear to us who are the persons intended to be represented, and such authorities as the Abbé BULTEAU, MALE and VOGE disagree in their interpretation, we cannot doubt that in the twelfth and thirteenth centuries their significance was well understood and was often the text of the sermons preached within the cathedral.

In their presentment of the iconography of Chartres the authors have not hesitated to take their photographs from unusual points of view, and even with distortion of the architectural lines, as the purist in photography might aver, so long as the object of their plates was attained—the illustration of the sculptures of Chartres Cathedral. They have also, as they tell us, made full use of the properties of the telephotographic lens, without which, indeed, such completeness and clearness of their study of the sculpture as we have before us would have been impossible.

We are glad to note that the authors call attention to the traces of colour that even now are still to be seen on the sculptures of the west front. It is one more piece of evidence of the far wider use of colour in architecture than most people of the present day seem able to realise as having been general in mediæval times. Here once more we find a bond of similarity between the two finest examples the world has seen of the conjunction of sculpture and architecture, the Parthenon of Athens and the Cathedral of Chartres.

NOTES AND COMMENTS.

THE libel action by which Mr. SIDNEY R. J. SMITH, F.R.I.B.A., has vindicated his character is peculiarly instructive. It shows on the one hand how more often than not the too prevalent idea that exists amongst some of the British public is fostered, that architects do not depend on their 5 per cent. for a living, but get something more out of the builder or manufacturers of special goods. Mr. SMITH'S detractor shot his bolt and ran away. He was not prepared to substantiate in court the charge he had made, and therefore it must be assumed that the accusation was false and without foundation, and the jury were evidently of this opinion in framing their verdict. It is a sad thing that an architect holding the position of Mr. SIDNEY SMITH should feel it necessary to bring an action for libel against a man of straw in order to vindicate his character, well knowing that whatever damages the jury might award him, he would not get a penny of them, but would certainly have to pay his own costs. It is undoubtedly the fact that there are people who believe that architects do follow the practice of which Mr. SIDNEY SMITH was accused, and it must be supposed that he thought that the class of public men who were his clients included some who might be inclined to believe the truth of the charges made.

Now if there is this readiness on the part of the public to believe that architects do thus betray their trust, it seemingly follows that there are some black sheep who give cause for this belief, and that the whole profession suffers in reputation in consequence. How can this be stopped? At present any rascal can put a brass plate on his door, styling himself an architect, and as such an individual would scarcely be lacking in audacity and push, he might induce somebody to employ him at a lower fee than the usual rate as set out in the Institute's publication of "The Professional Practice as to the Charges of Architects." A few illicit commissions and the rascal is better recompensed than a properly qualified architect with his 5 per cent. Thus the public is led to believe on the one hand that an architect is overpaid on the Institute scale, and on the other that illicit commissions are in vogue amongst the profession.

IT is to squash this class of gentry that the majority of architects believe registration to be necessary. If, with the exception of the present generation of brass-plate practitioners, no one is allowed to call himself an architect unless he is duly qualified and when so recognised is under the *régime* of some such code of professional ethics as obtains amongst lawyers and doctors, there will be little room for the man who takes work at low fees and makes up the difference in illicit commissions.

ON the other hand, the libel action to which we are referring shows how difficult it is to bring real offenders to book. Suppose Mr. SIDNEY SMITH to have been, instead of an honourable and well-respected architect, one who practised the taking of secret commissions, and his accuser a poor but honest man, how is the latter to face the ordeal of an action for libel or slander? However good your case and however true the charges you cannot go to law and especially face an action for libel unless you can afford to pay. Hence the difficulty under present circumstances of dealing with the few black sheep who bring disrepute upon an honourable profession in which they have no right to be enrolled, but from which at present no one can exclude them.

THE meeting that we report elsewhere and which was held at the Mansion House, under the presidency of the Lord Mayor of London, to discuss the present unsatisfactory state of industrial education and apprenticeship, does not seem to have arrived at any very definite conclusion, but at least served one end: to show that under present economic conditions the system of apprenticeship is impossible of revival. The big factory with its concomitant extended use of machinery and specialisation of the skilled worker has no place for the carefully-trained workman who is master of all branches of his trade. The law of maximum of output with the minimum of cost has abolished the man who could make a chair or a boot from start to finish, and has developed the machinist who can make or finish part of a chair or a boot perfectly and with the utmost rapidity, but who needs a dozen others equally skilful to do their part before the complete article is ready for market. While under the old style a man was making one chair now he and a dozen others have turned out a hundred.

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WE hope that the threatened demolition of the old Castle walls of York will not become a fact. An attempt at their removal was made some years ago, but fortunately averted. We should have thought by now that there exists not only a greater reverence and respect for landmarks of the past, but the knowledge that the possession of antiquities is a valuable asset to any town, and even to a cathedral city with the attractions of York and its Minster.

ONE would scarcely imagine St. Helens, Lancashire, as an art centre, but Sir JAMES D. LINTON, in opening the twelfth annual exhibition of water colours and oil paintings by members of the St. Helens Sketching Club, spoke very highly of the quality of the productions of the Sketching Club, expressing himself as quite astonished, and characterising the works he saw as "finished pictures, many of which were quite as good as one saw in any exhibition in London." No doubt the modesty which he described as characteristic of the English appreciation of their own artistic productions, and to which was largely due the false idea entertained on the Continent as to the quality of English art, is largely present in the members of the St. Helens Sketching Club, and has prevented the rest of England knowing of the high quality of the work there produced.

WE are glad to hear that the fund in aid of the reparation of Hexham Abbey Church is progressing well. Canon SAVAGE is certainly making earnest efforts to convince Churchmen of the urgency of the repair to the north transept of which Mr. TEMPLE MOORE has reported in strong terms, and says:—"This is a most grave indictment from our recognised expert, and is no 'wolf' cry, but represents an alarming state of things. We delay and postpone at our peril. If we perpetuate past neglect, we are guilty of grave breach of sacred trust. We can only act, and act with careful supervision, skilled and reverent attention, and rigid economy. Closer examination shows conclusively that the fabric in the 'danger sphere' is in a deplorably unsound and dangerous condition. I firmly believe that had we not, in 1905, repaired and preserved the gable of the north transept, it would have fallen utterly to earth, and would have brought with it in ruinous catastrophe the west wall and the tower. Had we not saved the tower in 1907, the tower would have been down. We have saved the two ends, and must now make permanently secure the length of wall between the ends. In the last century the east end of the choir was lost for ever by a fall, and the outside gable of the south transept in 1878. We dare not trifle in 1909. If the North has any regard for its goodly heritage at Hexham, the North must subscribe to save this west wall. We can levy no rate and impose no tax; we can only appeal for voluntary help, in reliance on the common sense, sympathy, and support of the North, for the ancient cathedral and mother church of Durham and South Northumberland."

ARCHITECTURE: ITS TRUE PRINCIPLES.—XXIII.

By R. OWEN ALLSOP.

ALPHA AND OMEGA.

A FINITE straight line has, æsthetically, two strong points—its beginning and its ending. If the principle underlying this postulate be applied to superficies and to solids, we may gain some idea of why, apart from constructional reasons, a column has base and capital, a wall a superimposed cornice, and perceive a *raison d'être* for many purely architectural devices, besides providing a most useful practical guide at all points of a design in the making.

At the commencement of this essay we instituted a comparison between mode in architecture and manner in man. It requires to be noted how potent for effect of conduct or behaviour are the commencement and closure of acts performed. But *finis coronat opus*—the end outweighs the beginning. A sudden appearance may be joyful, a sudden disappearance rarely so; and if this line of reason be applied, by analogy, to design, we see ample justification for what so often practically occurs in recognised architecture—the unprepared uprising of parts and features from what we might otherwise conclude to be incongruous places of genesis, a common enough, and a beautiful, characteristic in great mediæval buildings.

On the other hand, a sudden disappearance is generally painful or offensive—unless as where, say, Doric flutings are lost in the sunken necking, they again reappear and have a graceful termination—a designed discord, possibly, and return to the harmony. Apart from such exceptions an unmannered, unprepared termination is of all things most unsightly—witness the effect (quite independent of association) of the incompleted column during the course of building construction. We have before advanced the theory that plain surfaces do not strictly afford relief to the eye, hence it is diverted to boundaries, and so *panelling* is not only constructively good, but æsthetically sound in its proper medium. Yet again there may be a reflex action—the margin diverting attention to the enclosure—and where such margin is grandiose, as in a costly and elaborate entablature, vastly emphasised by a bold shadow beneath a powerful architrave, we are naturally disgusted to find a paltry wooden moulding, as in the margin to an expanse of plate glass. From these considerations we must conclude that there is a reason for emphasising a tower top, for the absence of plinths, and can assign a scientific, or quasi-scientific, reason for the offence of bald piers terminating against horizontal members, as architraves and the like. A rude, boorish *ending* has been provided.

There are two kinds of end in architecture, the end of a phrase (as it were) and the true finish—*omicron* and the true *omega*, in a sense. In this way the Doric column is unsuited to stand by itself (as a monument), the abacus being *omicron*, or completing a phrase and introductory to something else. The tapering spire is a true end or culmination. A magnificent cornice is a true *omega* in its place, and hence, doubtless, the reason of that insolvable problem—a satisfactory "attic." But the Doric abacus is an introduction to a new thing—the architrave—as well as completing the whole column, hence is not a finish in the sense of a final, crowning end.

Solid geometrical form seems to satisfy the eye as something complete—an entity—when it represents a regular figure—as a true cube—and it may be that, for this reason, the form just short of the full cube, as also the superficies just short of the true square, are not pleasing. Thus an incomplete cone may be considered offensive, whilst the complete cone is satisfactory. A sense of deformity would be apparent in taking off the top half of a spire. This resultant effect of incomplete elemental figures of geometry may be turned to practical account. The Doric shaft is an incomplete conico-cylindrical figure. For this very reason, emphasised by the numerous converging flute lines, a strong position is created compelling attention to the finish of the complete column, and enhancing the value of the capital.

It might further be argued that the plain cylinder of whatever extent is always an incomplete figure, since there is no reason why it should be either long or short, or of any dimension whatever, being the same incomplete figure at infinity. It thus resembles the straight line, which may be finite or infinite; and from that we might argue further that the cylinder, like the line, has two strong points—its beginning and ending—and that, as whatever the length it can never form any definite, complete object, the demands of æsthetics are that something must be provided to form a finish, as caps and bases. The same general idea leads one to conclude that a cylindrical column may as legitimately be made at choice only two or three diameters in height, or drawn out enormously as in the thin shafts in Gothic pier arcades. Either or any arrangement is—it is assumed—æsthetically correct. In some way, possibly, there is connected with this idea the unsatisfactory effect of the top of large cylindrical architectural masses, and a *motif* for the adoption of the much-criticised quasi-gable at the east end of St. Paul's

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Cathedral. Conversely, the unsatisfied valency—to borrow a term from chemistry—of the cylinder, makes a drum the best possible preparation for a crowning dome.

A study of the principle here suggested would perhaps prevent such unsightly practices as coarse "ornaments" stuck half-way up a pillar or pier—as a granite hemisphere on a lozenge in the centre of a pilaster. The clean run from base to capital of a column must be considered vital. To place any kind of device midway destroys the effect of this run, and draws attention from the legitimately strong points—base and cap—much as a coarse "swag" from volute to volute ruins the effect of the delicate modelling and light and shade about the Ionic capital.

Every sympathetic architectural draughtsman illustrates, perhaps unconsciously, this law of emphasising the first and the last—and the overruling of the first by the last—in lingering about the termination of vertical lines to the end of avoiding harsh terminations. It is an evidence of an insensible tendency towards a graceful completion of an act.

The general principle here sought to be expressed seems sufficiently natural and fundamental. The flower on the long stalk and the ill-defined origin among the leaves and grasses, exactly corresponds to the main idea. No great importance can be set on the origin (base) of a tower—its summit and upper part is predominant and overrules other parts. A considerable law, with notable exceptions, is a gradual enrichment towards the summit. Where the reverse is arranged and the last storey ends in baldness, the effect is generally offensive; and all elaborate Gothic buildings seem to have growth and upward culmination expressed—the spirit that we notice in a stunted, sturdy oak tree from knarled bowl to foliated finish.



Fig. 45.

Principles, however fundamental and recondite, are useless, and mass arrangements for effect mere vanity, and tend to an art akin to scene-painting unless the spirit of constructionalism overrides all other considerations. If mass alone, and without detail, satisfied the soul of the architect, he would rest content with producing scenic effects, in actual building, as bald as the accompanying sketches.

We suggested in an introductory essay that architecture might well be considered the abstract part of the



Fig. 46.

concrete entity building—that it may be reasonably regarded as a mode or manner simply. In this line of argument the actual building is the thing. We may construct an arcade, it may have ornate or plain piers and arches, but whether plain or ornate the piers and arches are the entity—they are what we desire, the necessary basis of utility. The architecture that we go out to see has walls, arches, piers, towers, pinnacles, domes. All history demonstrates that, given honest intention to build nobly, native talent, scarcely cultured and certainly not highly-gifted in draughtsmanship, beautiful architecture results from honest construction. Therefore, much as we may theorise on contrast, gradation, proportion, and the like, and their fundamental principles, it is all a mere addition to the real act of building or constructing; and it is not shown why we should go out to see fine curves, colours, or broken light about stone or marble whilst there are flowers in the field, sunlight in the west, and fleecy summer clouds, all so immeasurably richer in these distinctive attributes. Moreover, all architectural details (enrichments, carving, and the like) may be inspected on museum screens. Hence we conclude that we really go out to see massive arches as such, elegant columns as such, and real soaring domes and tapering spires. This view is well confirmed by the evidently powerful attraction of quite plain building where is shown an honest intention to produce the beautiful or at least some ruling spirit of grace. In such there is but one great point of difference—the manner how—the difference of line lengths, areas, and proportions, and relative bulks of this to that, all sufficiently evasive of tangible qualities to merit the use of the term "abstract." This spirit of construction must, when all is said and written, ever be that which is of the essence of the architectural. It must be a crucial test of the true architect that he sees interest and beauty, on its plane, in a simple well-built wall of honest brick and stone. It is not easy to imagine an architect who is not a lover of construction

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as such and who is not absorbed in watching the growth and development of building for its own sake and for its own interest. It is possible that the fascination of "rusticating" must be referred to the fact that it emphasises the spirit of construction—makes more evident that the whole is built up of parts. Unless this much is admitted, so-called first principles are a delusion. Plain, honest building, with intent to please, and naturally graceful as a mere result of that intention, if not architecture, is very near it indeed. All the offences of the ignorant, tasteless designer are not of neglect to add something to simple, plain building, but of uncalled-for and senseless additions to otherwise straightforward construction. Where such plain building is not architectural, it is not for the lack of concrete things, but by reason of the absence of an abstract quality—the manner how. Why is it that the elaborate city building repels whilst we dwell lovingly on the humble efforts of village masons? The answer seems to be that we are interested in honest, apparent construction, where the medley of steel backing and stone screen walls disgusts the soul of all who would give expression and purpose to the mere act of building. It must be concluded that expressive, visible, and homogeneous construction rules in true architecture, and to this principle all other principles must be secondary.

(To be concluded.)

THE SYMBOLISM OF THE CROCODILE IN THE MIDDLE AGES.*

AMONG the numerous animals found in ecclesiastical figure sculpture it is remarkable that so picturesque a character as the crocodile is rarely to be met with in any easily recognisable form. That it was frequently represented in some form or another seems more than likely from the fact that it can be shown by reference to mediæval MSS. to have been the subject of extensive symbolism.

In the earlier period, say the twelfth century, we should not expect to find crocodiles in natural form, owing to the lack of knowledge of its anatomy on the part of artists and masons, and to the fact that exact definition was not regarded as of great importance, only such details being included as might sufficiently indicate the subject. Considerations of space also led to the same result. A curious instance of this may be seen at Alne Church, Yorks, where there is a sculptured representation of a ship with two men in it, with some letters of the incised title Aspido above. This is the abbreviated Greek name of the Aspido Chelone, a shield-shaped tortoise or turtle, and in a secondary sense a great sea-monster, of which there is no sign at all in the picture; the ship is really resting on its back, the greater part of the beast being submerged in the sea.

In his work "L'Art Religieux de XIII. Siècle en France," M. E. Mâle points out that representations of Hell-mouth, such as may be seen on the tympanum at Bourges Cathedral in the scene of the Last Judgment, and elsewhere, were based on the crocodile's head, and that this symbolic employment was due to the description of it in Job, chap. xli. At Bourges the caldron into which lost souls are being thrust is set in the mouth of a monster, and the flames are being blown up by two demons with bellows. M. Mâle bases his view on the fact that the early commentators recognised in Leviathan a figure of Satan and his works. Honorius d'Autun wrote, "Leviathan, the monster who swims in the sea of the world, is Satan. God has cast His line in that sea. The cord of that line is the human generation of Christ; the iron of the hook is the divinity of Jesus Christ; the bait is His humanity. Attracted by the smell of the flesh, Leviathan wishes to seize it, but the hook tears his jaw." The seething-pot, however, which also represented hell, was not always placed in a monster's mouth—*e.g.*, on the great painting at Chaldon, Surrey, A.D. 1200, it stands on its own legs.

This symbolic use of the crocodile clashes altogether with the view held by most archæologists that Jonah's fish was the motive from which such sculptured representations sprang. Although we now know that Job's Leviathan was the crocodile, the people of the Middle Ages probably regarded that animal as some dragon or sea-monster.

The best evidence of the symbolism of the crocodile is to be found in the mediæval "Bestiaries." These were religious natural history books founded upon the appearance and habits of animals, birds and reptiles, the whole being employed to teach religious or moral lessons. In thirteenth-century "Bestiaries" the crocodile usually appears twice over, being classed both with the larger sea-fish and with the land animals. In one MS., for instance, it appears as a long thin yellow eel with a long mouth, and further on among the animals as a clumsy beast. The description given is much the same in all, though the symbolism is usually to be found under its heading as a land animal. MS. Harl. 3244, folio 43, says that under this figure hypocrites and men of luxury and avarice are symbolised. As the crocodile rests by night in the water and by day on land, so hypocrites, although they live in luxury, are delighted if they are reported to live just and holy lives. As the crocodile alone of all animals moves its upper jaw and keeps the lower one immovable, so hypocrites show forth in word only examples of the holy fathers and a goodly supply of their good words; while in deed they show forth very few of the things which they say. Whereas of its dung temporary rejuvenating ointment is made which quickly comes off, so evil men are generally praised by the unlearned for their evil deeds, and are glorified by the praises of this world, as it were with an ointment, but which when the Judge comes will vanish like smoke.

These details came not from Job but from Pliny's "Natural History." That author, who in his turn follows Aristotle and Herodotus, seems to have inspired many of the "Bestiary" illustrations occurring under the heading of Cocodrillus, which show a crocodile either devouring a man or holding him in its claws. It is probable that some of our church carvings of beasts swallowing human beings represent this phase. The symbolism largely speaks for itself. The ingenuity with which the various points of the crocodile's appearance and habits are turned for either religious or moral teaching is something marvellous. It is a symbol of hypocrisy and deceit. The ointment episode is evidently the *pièce de résistance*. Luxury—*i.e.* vice—and avarice were regarded as the two worst sins; and they are the butt of the moralist in the "Bestiary" over and over again.

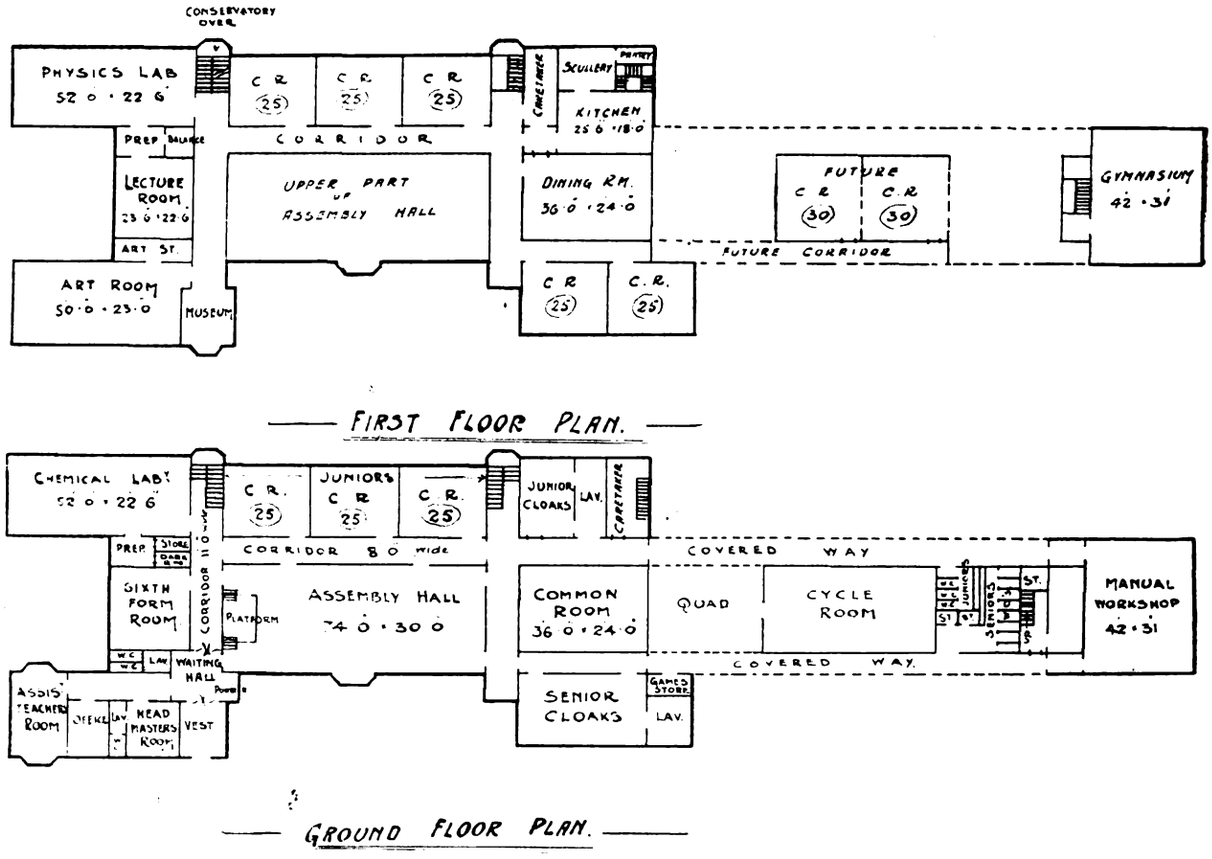
In architecture we have several beasts which are intended for crocodiles, judging by their resemblance to the MSS. illustrations. At Tissington, Derbyshire, on the Norman font, are two beasts of the clumsiest description, one with a human head in its jaws, the man having been swallowed head first. At Ilam, Staffs, there are two beasts on the Norman font. One has a human head in its jaws, and the other the same, but with a second head lying below. Both these beasts have long tails and feet with long claws. At Bradbourne, close by, on the tower doorway, a beast is shown in relief swallowing a man feet first. On the south side of Yaxley Church, Hunts, there is a big beast astride the parapet which may be a crocodile. It has a long mouth and tail and clawed feet. This, with the other animals on the exterior, appears to date from the fourteenth century.

A much more important episode in which the crocodile is concerned is where it swallows the hydrus, or water snake, and it is one that had a far greater influence upon architectural detail. MS. Harl. 4751, in describing an animal in the river Nile called hydrus, thus describes its method of attack:—"This hydrus is quite hostile to the crocodile, and has this nature and habit, that when it has seen a crocodile asleep on the shore it goes, if its mouth be open, and rolls itself in the mud in order that it may be able more easily to glide into its jaws. The crocodile then suddenly swallows it alive, and then the hydrus, after tearing all the crocodile's bowels to pieces, emerges not only alive, but even unhurt. So then death and hell have the likeness of the crocodile, for the Lord Jesus Christ is hostile to them. For taking on Himself our human flesh, He descended into hell and, bursting all its bowels, led out those who were unjustly held bound by it." The illustration shows half the hydrus in the form of a winged dragon down the dead crocodile's mouth, and the head coming out of his side unhurt.

Here is proof of the crocodile being directly employed to symbolise death and hell in the scene of the "Harrowing of Hell," coupled with illustrations which show it more or less as a beast, or at least with a beast-like head. There appear to be only two examples of this striking symbolic form in ecclesiastical architecture; one is at Bury St. Edmunds, the other at Kilpeck, in Herefordshire. These are the only sculptures in which the crocodile can be at all identified. There is a remarkable correspondence between them. They are of about the same period, of similar design and purpose, and might well have been the work of the same hand. At Bury St. Edmunds the sculpture is part of a gargoyle on the south side; it consists of a crocodile's head with the hydrus

* Abstract of a paper read before the Royal Archæological Institute on December 1 by G. C. Druce, Esq.

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SKETCHES OF FIRST PREMIATED DESIGN FOR PRESTON GRAMMAR SCHOOL.
Messrs. Woolfall & Eccles, Architects.

as a curled snake in its jaws. At Kilpeck the sculpture is more accessible. There is only a head, but it is a good one, and the artist has included a little typical ornament. The hydrus appears as a snake wriggling down its throat. Why this subject is so scarce it is difficult to determine. Presumably the mediæval artists preferred to represent Christ in human form in the "Harrowing of Hell" scene.

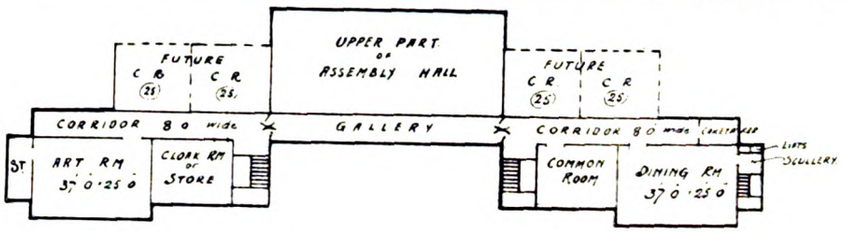
The three scenes in which Hell-mouth principally occurs are "The Fall of the Rebellious Angels," "The Harrowing of Hell," and "The Last Judgment." The second is much more common than the first. For general details the twelfth-century example at Lincoln Cathedral on the west front (not to mention two others on the same building) is good. "Hell-mouth" appears as a beast's head with ears, oval eyes, nostril, and skin-folds plainly shown. It is filled with souls, who hold out their hands towards Christ. On the Norman doorway at Quenington, Glos., there is one of the best known sculptured examples of the subject. Satan lies with his hands bound with a ring, as at Lincoln, and Christ thrusts His cross down his throat. "Hell-mouth" in this, as in other English examples, is represented by a head. A further stage is reached at Kencot, Oxon, where on the tympanum of the south doorway both parties in the scene are represented in symbolical form. Sagittarius, here symbolising Christ, is shooting an arrow down a beast's throat.

The subject occurs also in wall paintings. At Pickering there is a fine fifteenth-century example with some good details which correspond well with the MSS. Here "Hell-mouth" is very plainly a beast's mouth with ears, teeth, skin-folds behind the nose (which closely resemble the crocodile shown in MS. Slo. 3544, although painted quite 100 years later), and a little hairy beard. Illustrations of "Hell-mouth" in MSS. dating from the eleventh to the fourteenth centuries vary but little; they all show beast-like heads—one somewhat resembles that of a crocodile and is of grey colour.

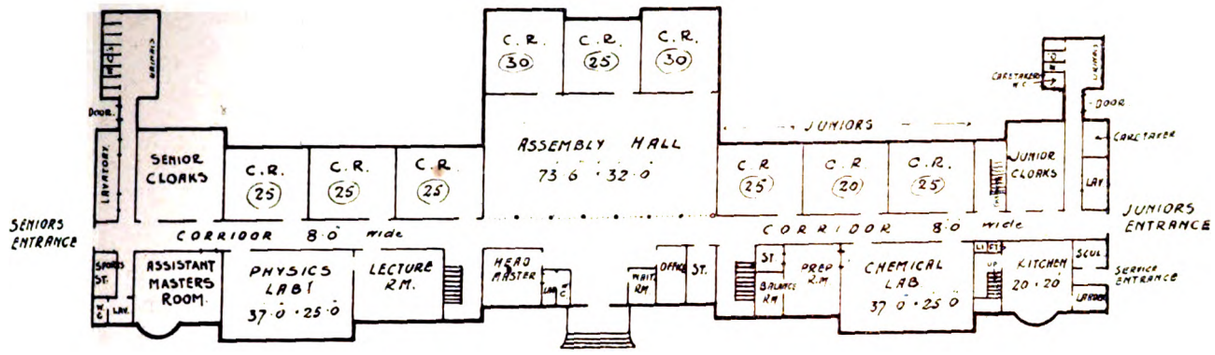
As already mentioned, many, if not most, archæologists attribute the beast's head to be that of Jonah's fish taken from his prayer of thanksgiving, "out of the belly of hell," when he had been thrown up by the fish. The earliest illustrations of Jonah are in the Roman catacombs. In the catacomb of Calixtus the fish is clearly one of those hippocampi, or sea monsters, found in classical art having front flappers or paws, big ears, and a much-curled body and tail. In these and other very early representations it is a sea-monster of the dragon type, with wings and curled tail, and it follows the form of marine monster so frequently found in that Pagan art from which Christian art had not yet separated. It is possible that some particular figure in classical mythology, such as the sea-monster of Andromeda, was used as the model for Jonah's fish. Perhaps the earliest "Hell-mouth" is on a Carlovingian ivory of about the ninth century at South Kensington, and it bears no resemblance to the contemporary allegorical classical sea-monsters. All the mediæval illustrations of Jonah and the fish at the British Museum show that the artists intended to draw a natural fish, and their efforts were on the whole fairly successful. Two misereres in Ripon Cathedral show Jonah first being thrown to, and then being disgorged by, a shark-like fish. In the "Bestiaries" Jonah's fish is described, under the heading of "Aspido Vel Cete," as of a size so great that sailors mistook it for an island, and, disembarking, lighted fires on its back, which, when the beast feels it, dives into the water and draws the ship after it. "Thus," says MS. Harl. 3244, "suffer all who are of unbelieving heart and such as are ignorant of the wiles of the devil, putting their trust in him and binding themselves to his works. They sink together with him into the Gehenna of burning fire. Such is his cleverness."

In the English-Latin "Bestiaries" the illustrations of the crocodile show it to be practically always a beast-like animal, and those of Jonah's fish, though both symbolised hell, a more or less natural fish. The "Bestiaries" professed to deal with natural forms, except when they treated of fabulous forms. The paintings and carvings of "Hell-mouth" in churches certainly show a beast's head, not a fish's. It seems probable therefore that an animal was taken for a model, and that that animal was the crocodile. The artists and carvers probably took their cue from the "Bestiaries," with which they were well acquainted. The earliest allusions we have to the "Bestiary" are in the fifth and sixth centuries, and if they were the product of some Christian monk at Alexandria, as is supposed, the crocodile would have had a good chance of being one of the first animals to be made use of and illustrated. No other animal or reptile mentioned fulfils the *rôle* of supplying the model for "Hell-mouth" as does the crocodile.

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— FIRST FLOOR PLAN. —



— GROUND FLOOR PLAN. —

SKETCHES OF SECOND PREMIATED DESIGN FOR PRESTON GRAMMAR SCHOOL
A. J. GREENWOOD, Architect.

ILLUSTRATIONS.

QUENBY HALL, LEICESTERSHIRE.

THIS hall was erected in 1636 by one GEORGE ASHBY, in whose family the seat of Quenby had been vested for many years. The unique position, standing on a plateau at a height of five hundred feet above the sea-level, lends an imposing appearance to the structure, and the colours produced by the weathering on both the brick and stonework give an additional charm to it.

The outline of the plan partakes of the later form brought about by evolution from the quadrangular court of the Middle Ages through the gradual omission of the sides forming the quadrangle, and by the extension of the wings producing the so-called H plan.

The great hall still poses as the important feature of the residence at this period, monopolising the first two storeys, and this prevents the possibility of gaining access from one wing to the other except by the ground and second floors, an inconvenience which has just been remedied during recent alterations by limiting the height of the hall to one storey, and thus forming two large rooms on the ground and first floors respectively, but it has been done at the expense of losing the dignity hitherto possessed by this feature.

Certain alterations have been effected from time to time in the arrangement of the plan, but nothing organic, and minor details, such as windows being blocked up and painted in imitation of lead cames, have been brought into their original condition of late.

(To be continued with further illustrations next week.)

NEW CHURCH OF ST. MICHAEL, SUNNYSIDE, BERKHAMSTED.

THIS is a new church, built to replace a small iron chapel-of-ease to the mother parish of Northchurch, Herts, some miles away, Sunnyside, although an extension of the old town of Berkhamsted, being in Northchurch ecclesiastically.

The new church has been erected with funds subscribed in the locality, aided by a grant from the Incorporated Church Building Society, of 7 Dean's Yard, S.W., the chancel and its fittings being given by Sir RICHARD COOPER, Bart., in memory of his brother, the late Mr. HERBERT COOPER. The treasurer of the building fund, Mr. GEO. K. HEXT, has borne the cost of the bell turret; and the oak lectern, litany-desk and offering-box, from the architect's designs, have been presented by Mr. A. P. BOYSON, by the architect and the contractors respectively.

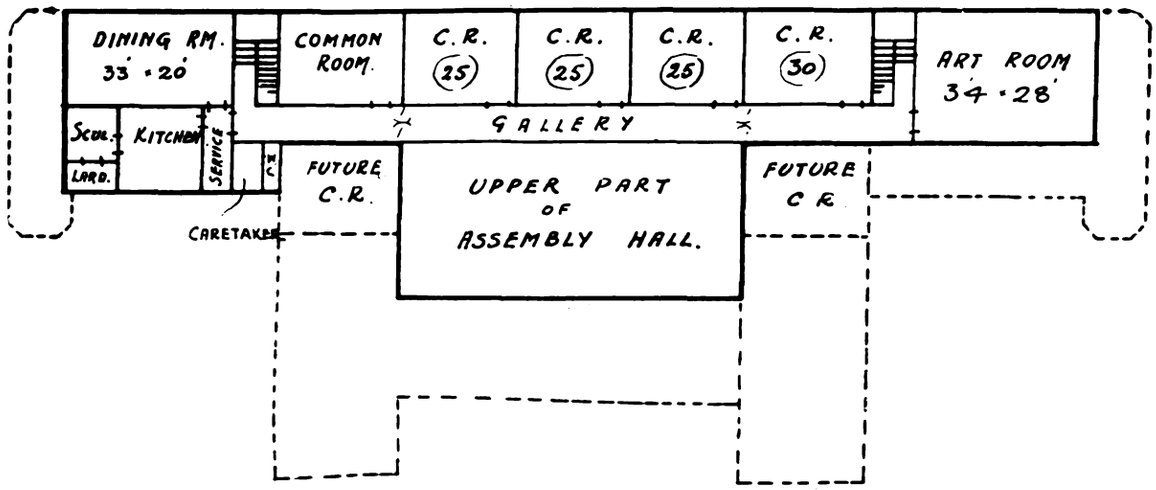
The heating chamber and foundations were made the subject of a preliminary contract, which was taken in competition by Messrs. H. & J. MATTHEWS, of Berkhamsted. The foundation-stone of the main building was laid on July 25, 1908, and it was consecrated on June 30, 1909, by the Bishop of ST. ALBANS, the second contract having also been carried out by the same firm of builders from the designs and under the superintendence of Mr. P. M. JOHNSTON, F.S.A., F.R.I.B.A.

The warm-air apparatus and ventilation were installed by Mr. JOHN GRUNDY, of City Road, N., and the stained-glass windows in the chancel are from the studios of Mr. N. H. J. WESTLAKE, F.S.A., the plain glazing being supplied by Messrs. HAYWARD BROS. & ECKSTEIN.

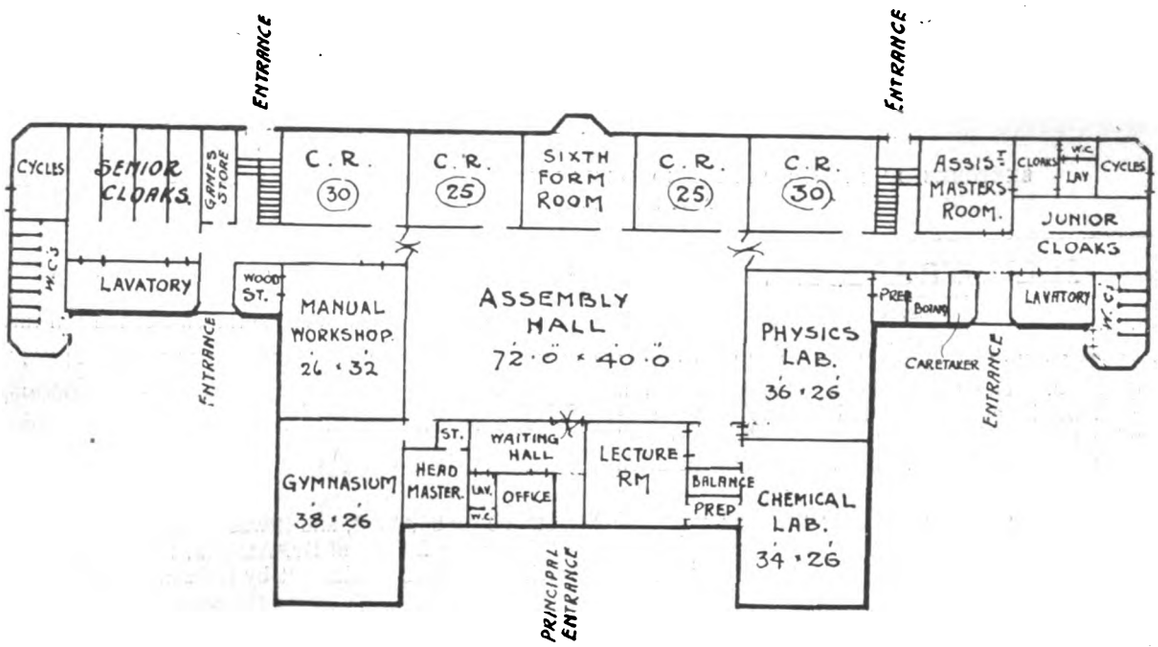
The style of the building and its fittings throughout is that of the early part of the thirteenth century. Local materials, such as field flints, partly dug on the site, and Totternhoe stone (for internal dressings), were largely used. Sussex marble, from the lately reopened quarries, has been employed in the chancel, while Monk's Park and Tisbury stone have been used for the external and some internal work. The roofs have been tiled with sand-faced tiles, and the bell-turret is oak-boarded, with a shingled spire. Most of the wrought ironwork has been executed from the architect's designs, by Mr. W. BAINBRIDGE REYNOLDS and Messrs. H. & C. DAVIS, of Clapham. The encaustic tile pavements, also specially designed, were carried out by Messrs. W. GODWIN & SONS, of Lugwardine. Hereford. A special feature in the construction is the use of concrete for the heart of the walls, with a flint facing externally and a skin of brickwork on the inside.

In plan the church consists of nave, south aisle, and porch, chancel and vestry of two storeys. A detached gardener's tool-shed has been separately built at some distance from the west end to enclose the chimney of the heating apparatus, the flue being carried underground.

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— FIRST FLOOR PLAN. —



— GROUND FLOOR PLAN —

SKETCHES OF THIRD PREMIATED DESIGN FOR PRESTON GRAMMAR SCHOOL.

Messrs. Packer, Drewitt & Drewitt, Architects.

Accommodation has been provided for over 300, at a total cost of between 3,000*l.* and 4,000*l.*

The drawing from which our illustration was taken was exhibited in the Royal Academy this year.

BANK AT MIDDLETON, LANCS.

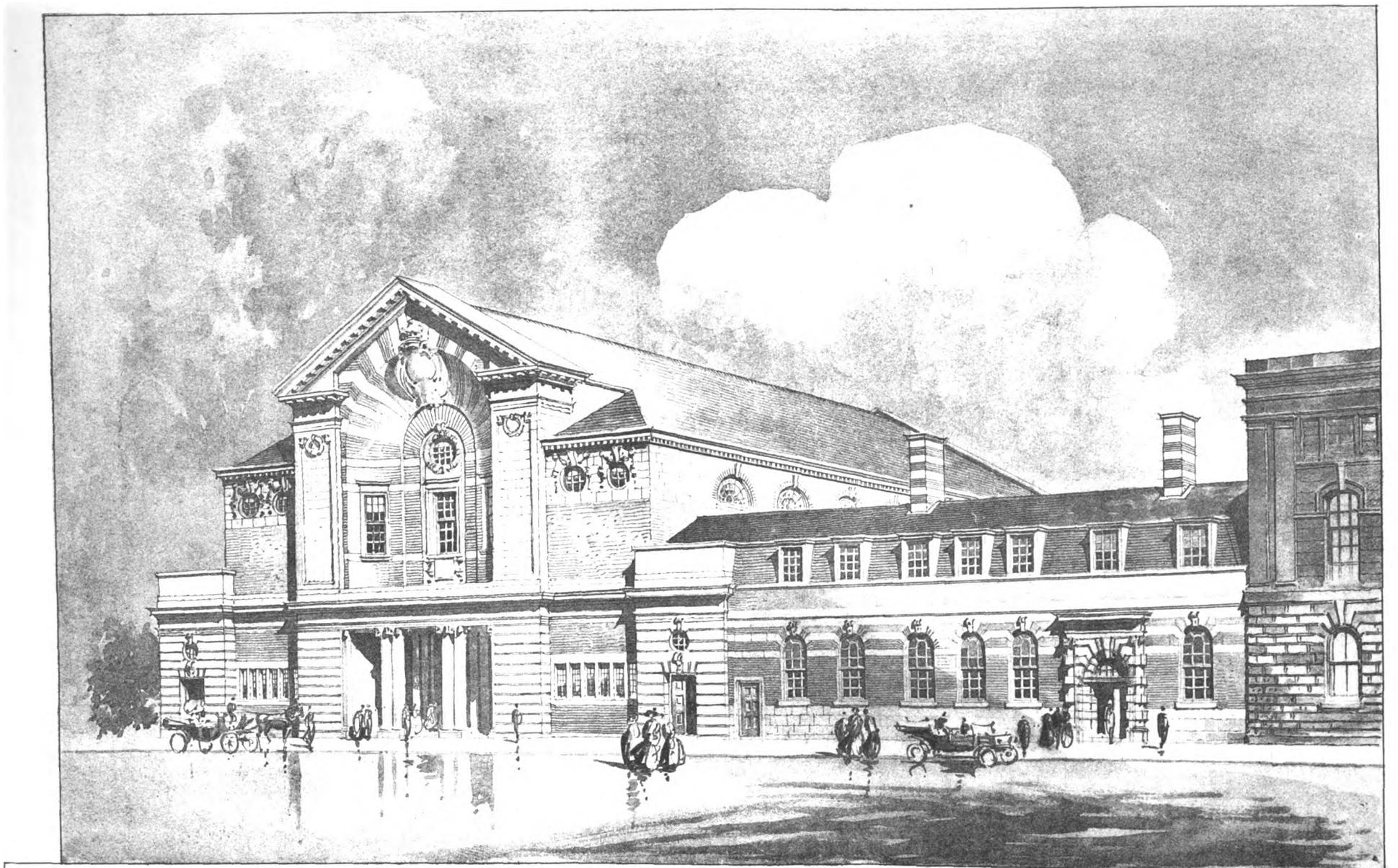
THIS bank is in course of erection, and will consist of a large banking-room and strong-room on the ground floor, with a store- and clerks' mess-room above. In the basement are store-rooms, heating cellar, &c. The front is to be in Portland stone. The tender of Messrs. Grundy, of Middleton, amounting to 2,090*l.*, was accepted. The architects are Messrs. Potts & Hennings, Manchester.

COMPETITION DESIGN FOR TOWN HALL, STOKE-UPON-TRENT.

THE following is an extract from the authors' report:—"On account of the greater convenience, all the departments are kept on the ground floor, which arrangement is, no doubt, a desirable one. The large assembly hall, with accommodation for 3,250, is placed with its main entrance from Tower Street. Accommodation is provided for cloaks, &c., both in connection with this entrance and also the approach from the Glebe Street entrance. The entrances and accommodation for the chorus and artistes should work conveniently as arranged adjoining Aqueduct Street. Attention might be drawn to the convenience of the prisoners' entrance and the public entrances to the galleries of the Court and the small assembly hall. The present building is altered to suit the new conditions, and the tenancy of the store in the basement is maintained. The elevations to be carried out in red-facing brick and Hollington or Darley Dale stone dressings." The estimated cost was 25,164*l.* The joint architects are Mr. Albert E. Dixon, A.R.I.B.A., 9 St. James Square, Manchester, and Mr. John H. Markham, A.R.I.B.A., 2 Gray's Inn Square, London.

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PHOTO-LITHO. SPRAGUE & Co. L. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

New Church of St. Michael, Sunnyside, Berkhamsted.

Philip M. Johnston, F.R.I.B.A.
Architect.

Note. The Nave is lighted from the West & North.

The Architect. Dec. 10th 1909.

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Philip M. Johnston, F.R.I.B.A.
Architect.

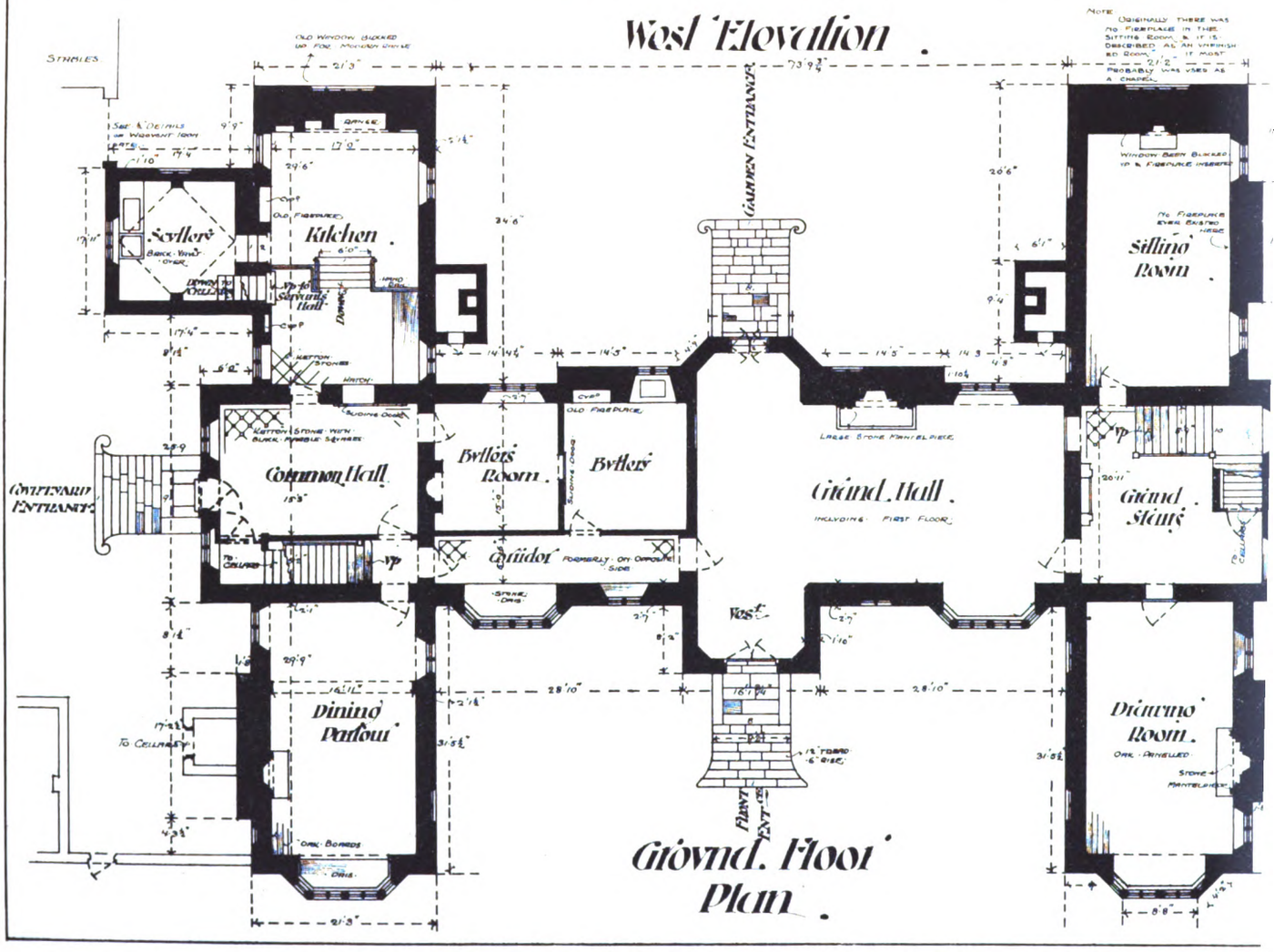
Note. The Nave is lighted from the Wharf Road.

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QVENBY HALL. *Leicestersh*



West Elevation.



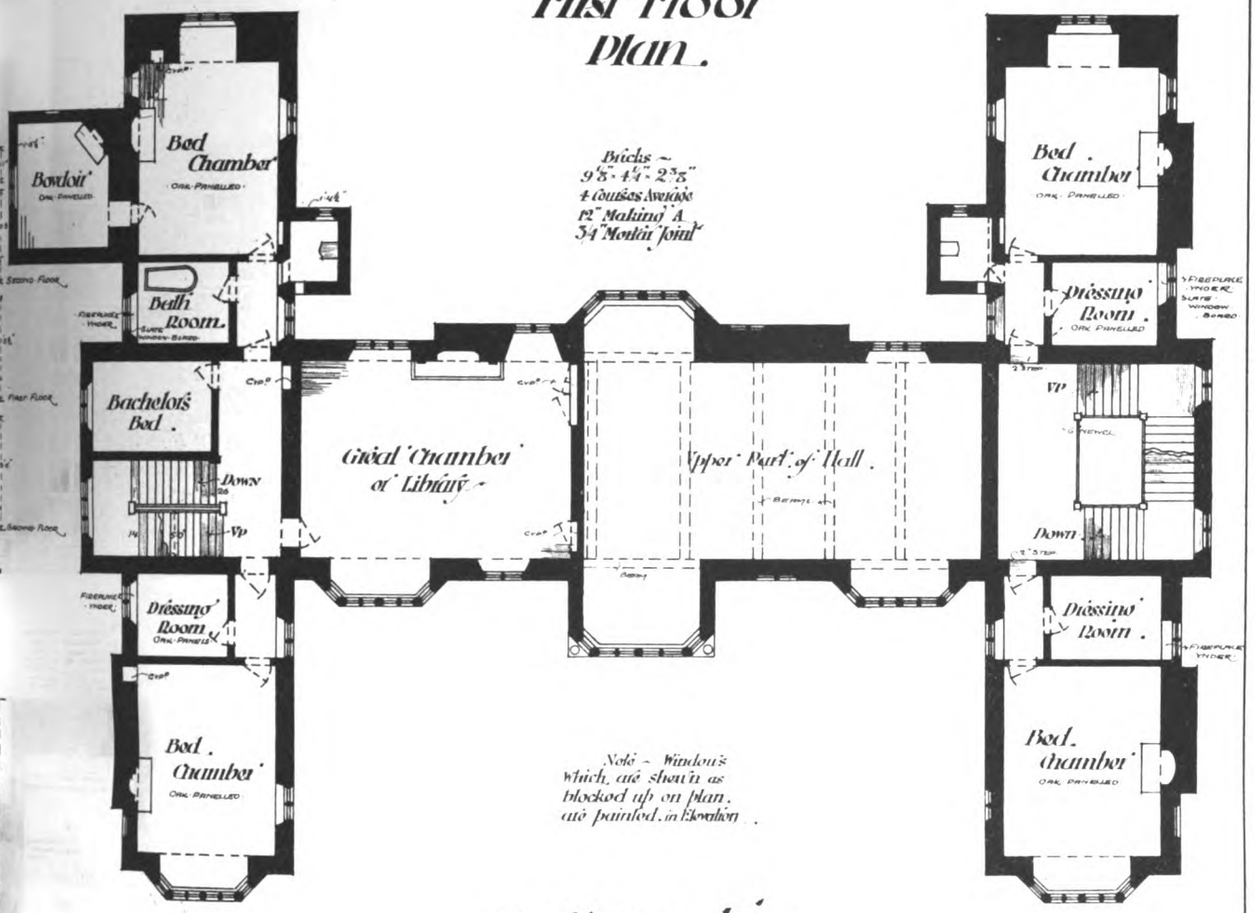
Ground Floor Plan.

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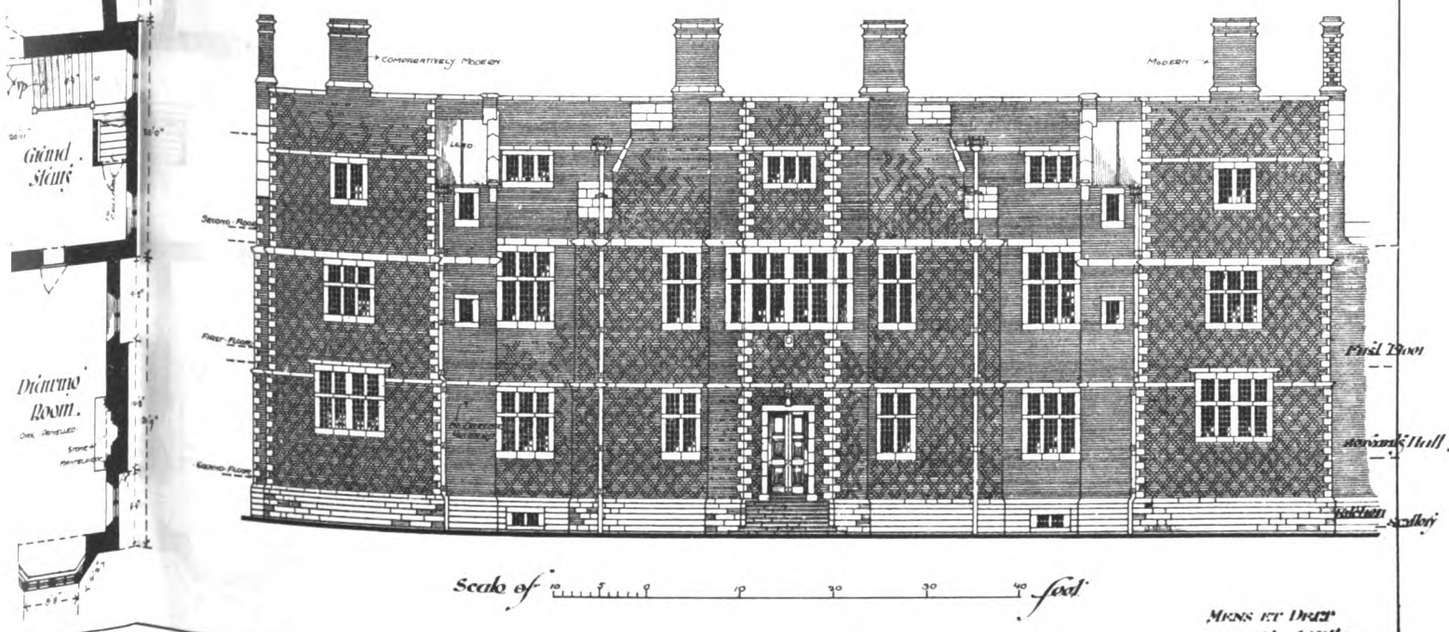
Drawing No 1.

Leicestershire Built in. 1636

First Floor Plan.



East Elevation.



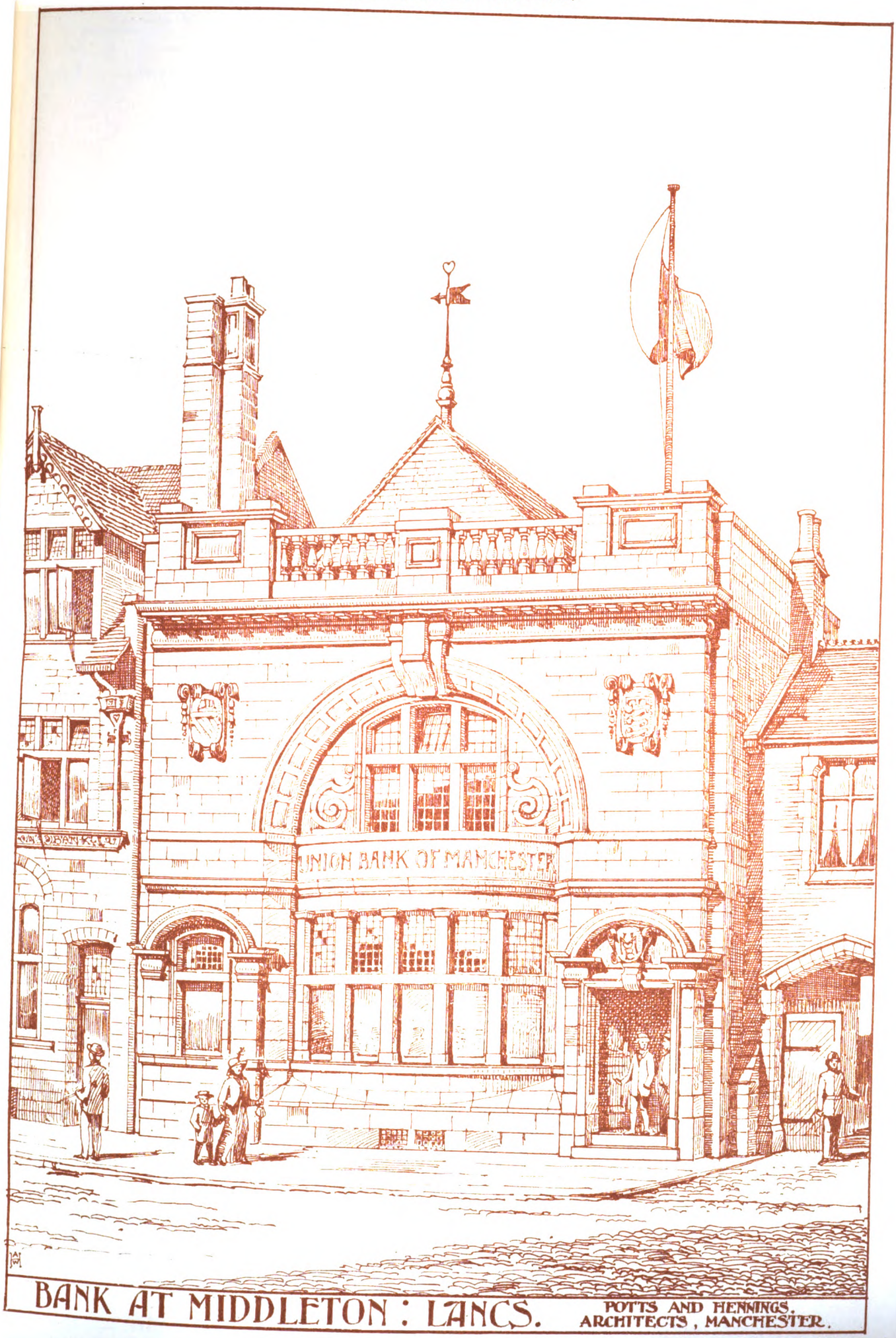
Scale of 10 0 10 20 30 40 feet

Messrs ET Dent
W. Lloyd Mills.

PHOTO-LITHO. SPRAGUE & C° L. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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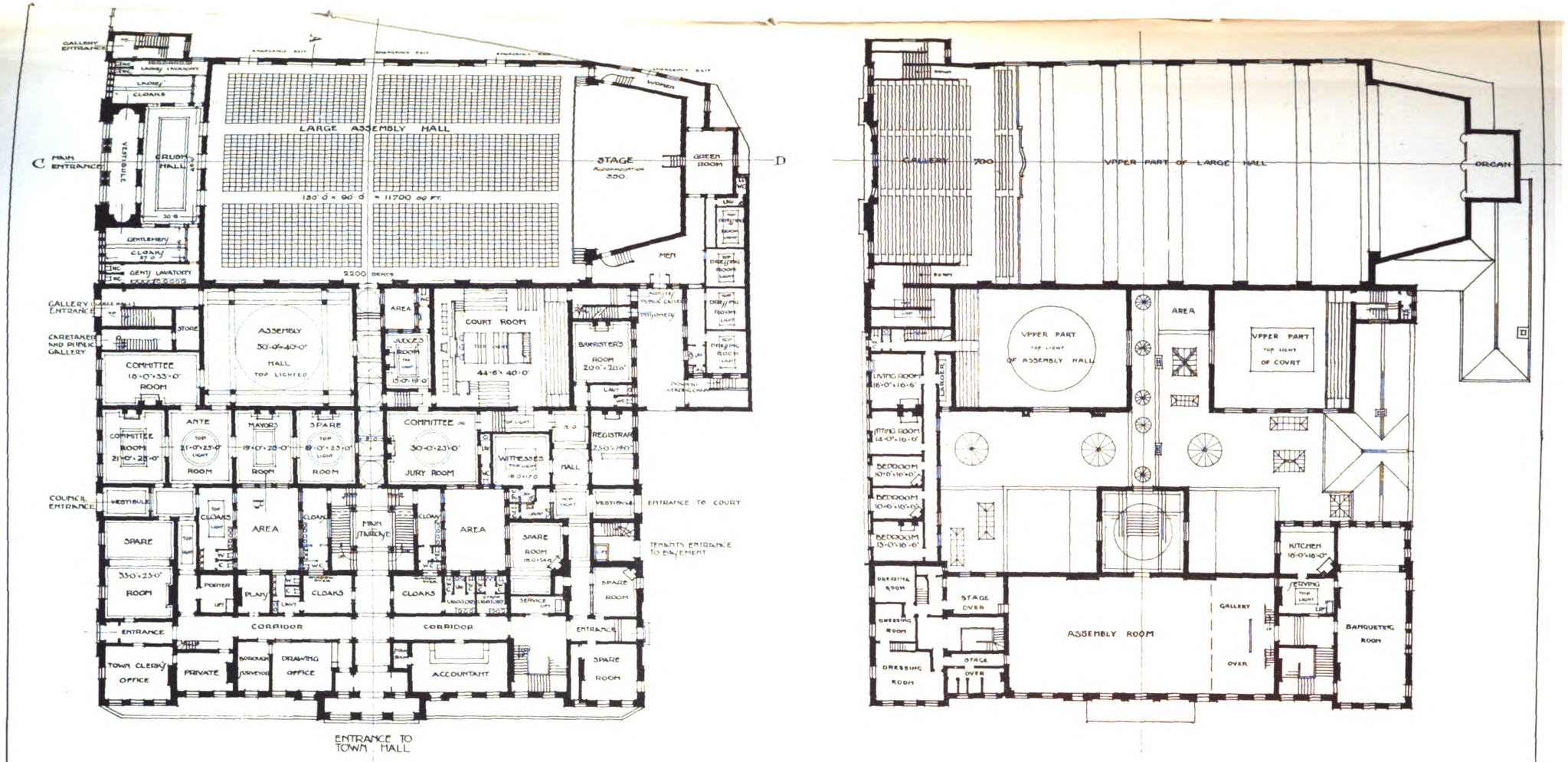
BANK AT MIDDLETON : LANCS.

POTTS AND HENNINGS,
ARCHITECTS, MANCHESTER.

PHOTO-LITHO. SPRAGUE & Co. L.D. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

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GROUND FLOOR PLAN

FIRST FLOOR PLAN

Dixon & Markham.
96 James St.
Manchester.

INK PHOTO SPRAGUE & CO LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

COMPETITION DESIGN FOR ADDITIONS TO TOWN HALL, STOKE-UPON-TRENT.

By Messrs. DIXON & MARKHAM.

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THE SOCIETY OF ARCHITECTS.

A MEETING of the above Society was held on Thursday, December 9, when the following paper on "Town Planning" was read by Mr. Raymond Unwin (member):—It was said of Cecil Rhodes that he thought in continents. The passing of the Town Planning Bill throws upon the architectural profession the duty to expand the scale of its thinking somewhat in the same way. For the last generation or two, in this country at any rate, the architect has centred his thought upon the individual building which he was commissioned to design, and his total inability to influence the surroundings has led him to a large extent to ignore them. The town planning movement, culminating, as it has just done in the passing of an Act conferring powers upon municipal bodies to lay out the plans of their towns in advance, and to make, at any rate, a beginning of treating their towns as large units to be considered as a whole with some foresight, calls upon our profession especially to remember that the whole is greater than the part. We must begin to think in streets, in districts, and in whole cities, and henceforth to regard our buildings not so much as isolated efforts, but as units in a larger whole. Town planning, though in this country almost an unknown and forgotten art to-day, has been practised in all ages and in many parts of the world, and town plans when examined will be found to show an almost infinite degree of variety and individuality. What one may perhaps call the modern period of town planning has already passed through several phases of development in other countries, noticeably in Germany, where during the last fifty years there have developed different styles, characteristic of different periods, showing a growth analagous to the different styles and periods we are familiar with in architecture. As an example of the earlier style as applied to an entirely new town, I may perhaps show the plan of Dalny, which shows evidence of a study of some of the exercises in ideal town planning, such as those of Vasari il Giovane and Scamozzi, at the end of the 16th century, or of Roland Levirloys at the end of the 18th century, with the irregular geometrical plans characteristic alike of Haussmann's work in Paris, and of the German work in the middle of the 19th century. This plan is of special interest, as showing the care that was taken in surveying the ground before the plan was made; not only do we find careful contour levels, but also wind and weather diagrams, the prevailing winds and the aspects having both been taken into account in determining the direction of the main roads.

In the plan of Cologne, we see town planning applied to the more common case of the extension of an existing town. This plan illustrates also the change in the character of German town planning. In the centre may be seen the irregular street lines, characteristic of the medieval town, with a few more modern roads resulting from improvement schemes. In the zone immediately outside this area, which was set at liberty by the extension of the fortification lines during the last century, we see the geometrical type of planning, very like much of that which can be found on the plan of Paris. Cologne has again outgrown its line of fortifications, and, moreover, the change in the character of warfare has rendered them obsolete, and the town is now developing suburbs all round. These it will be seen are being planned by the municipality far ahead of the development, but the geometrical pattern work has been displaced by more flowing lines, showing a marked reaction from the rigidity of the former manner. This may fairly be taken to indicate the intermediate German style and period of German town planning work. It is very interesting to compare the old plan of Paris with the modern plan, and to see the extent to which Haussmann's geometrical planning has displaced the medieval irregular street lines of which Paris once entirely consisted.

The influence of Camillo Sitte in Germany, Austria, and the central European countries generally has resulted in a further development of the curvilinear and irregular style. He advocated a careful study of medieval town plans, and put forward the theory that these plans were the result of conscious design on the part of a people thoroughly imbued with artistic instinct and tradition; and he deduced some rules and many suggestions as to the causes of the wonderful picturesqueness of medieval towns and cities. The plan for the extension of the little town of Kufstein is one of the best examples I know of the most modern style of German work, in which the town planner concentrates his main attention on the building up of picturesque street pictures. Every street, every junction, and indeed, one may say every view in this plan has been carefully thought out, so that when the buildings arise on the building lines laid down, they may group together in the picturesque manner characteristic of medieval cities. It will be found also, that although in no direction are there long, unbroken streets, nevertheless, the lines of the roads are so contrived that it is possible to get about the town in all directions, without inconvenience. At the same time, it would not be very easy to plan an extensive tramway system for such a town.

The plan of Marienburg is a very good example of a combination of the two styles of planning. We see certain straight thoroughfares giving a sense of framework to the town plan, while the details are filled in with the irregular streets, planned to produce picturesque groups of buildings so characteristic of the modern German school.

Signs are not wanting that there will shortly be in Germany considerable reaction against the extreme irregularity and the excessive striving after the picturesque which has marked their recent work. Here in England, we are about to take up this new art of town design. It behoves us to study very carefully all that has been done before. We have the great advantage of being able, if we will, to profit, by the extensive experiments in different styles of work that have been carried out on the Continent during the last fifty years. We have in this country scraps of two traditions in town planning. There is the very regular and symmetrical work characteristic of the Renaissance period, when, for a while, large schemes were grasped and sometimes carried out, as we may see in many parts of London, notably in the squares lying between Holborn and the Euston Road, and in part of the district round Regent's Park. In addition, we find in Bournemouth, Buxton, Eastbourne, and some other towns, that have grown up mainly on the property of one great landowner, town plans worked out under the influence of the landscape school of gardeners, consisting of flowing so-called natural lines, but generally speaking lacking in any large grasp or any sense of wholeness in the completed plan. I think it is of the greatest importance that we should, in this country, not make up our minds too hurriedly as to one style or the other, until we have pretty thoroughly grasped the advantages of both, and the reasons which have led to the adoption of one or the other. I cannot help thinking that we have here, as so often, the elements of a new synthesis, and hoping that it may be within our power to evolve in this country a style of town planning which shall show alike a due appreciation of the beauties of our usually irregular and undulating sites, and of that other beauty which springs from ordered and regular design. The problem before us really is how to weld together into one harmonious whole the undulating surface and irregular features of our country and the definite lines and ordered arrangement characteristic of good design. And, with a view to further illustrating this, I would like to contrast for you two cities.

The first is the peasants' city of Rothenburg, a unique example of unspoiled medieval picturesqueness, the character of which springs not from the possession of supremely beautiful buildings, but from the fact that in the whole of the town there is hardly one that does not show a simple comely beauty. The plan is interesting as showing how the form of the town has been influenced by the nature of the ground, the line along the west side following the crest of the high ground on the edge of the deep ravine which has been worn out by the winding Tauber, a small river, the musical murmuring of which, as heard all along this side of the town on a quiet evening, adds not a little to the charm of the place. It is a characteristic medieval plan marked by an entire want of symmetry and regularity, subordinated to the double line of fortifications, one dating from the 13th and the other from the 14th century, beyond the outline of which, except for a small settlement adjacent to the railway station, the town has never developed. But, while lacking that symmetry and order which goes to make up a pattern on paper, none the less this plan has in it many of the far more important elements of a good town design. It has, in a marked degree, both scale and framework. Its Market Place with the group of smaller *places* linking it up with the great Church, the Rathhaus, and the Herrngasse, the great street in which the patricians of the town once lived, form together a centre finely dominating the town, while the roads leading to the main gateways are also marked out in importance by their comparative width and directness. I must not omit to mention the delightful absence of that region of untidy allotments, derelict building sites and rubbish heaps which forms a girdle round nearly all our growing towns to-day; the way in which the unspoilt country comes right up to the wall of the town, inside which the crowded, I must admit, in many cases over-crowded city commences, has a very fine effect, and one which suggests to us whether there may not be found for our modern suburbs

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some means of defining and limiting their areas adapted to our modern conditions of life as the town wall was adapted to those of our forefathers.

Before passing from this beautiful little city, which, more than any other I know, carries one back to the time when all building work was governed by a simple instinctively appreciated tradition which seems to have made it as natural to build beautifully as our modern life has seemed at times to make it natural to do the reverse, I would like to emphasise the unity of effect which has resulted from the following of that tradition. Almost every building in the town, including the Rathhaus and the church, is roofed with the beautiful hand-made Rothenburg tile of a quiet brown colour, here and there brightened with touches of brilliant red where the tile has cleansed itself, as such tiles will. The buildings are either built of stone, the prevailing tones of which are cream and light brown, or more frequently are plastered and treated with lime-wash of very similar tones. Bits of bright green and grey occur in the woodwork, the whole producing a unity of effect which is quite astonishing to anybody accustomed to the hopeless jumble of materials, colours, styles and forms which characterise the modern town or suburb. And yet there is no lack of variety, for while the general form of the town, the multiple gables and picturesque groups of turrets and pinnacles give it an essentially Gothic character much of the detail is distinctly Renaissance.

In the slide which I show of part of the Oberschmidtgasse this variety is well illustrated.

Let us contrast with Rothenburg the city of Karlsruhe, which owes its origin to the Margrave Charles William of Baden-Durlach, who transferred his residence thither in 1715, at which date the plan of the town was made. It is now the capital of the Grand Duchy of Baden, and as will be seen from the plan, the Ducal Palace forms the central feature of the town. A tower ingeniously built out on a wing stands on the centre point from which a series of streets radiate to all parts of the town, so planned that this tower is the terminal feature in one direction along all these streets. On the other side, there is an extensive forest, through which straight alleys have been cut, radiating from this tower in like manner. The Market Place is formed on the axis line of the town, which coincides with the central radiating street. Before the Schloss is a large fan shaped garden *place* having the front of the Schloss at the apex with stable buildings, barracks, residences, and a theatre, forming the radiating flanks, while round the circular arc is built up a colonnaded crescent of houses, cut at intervals by the narrow radiating streets. Beyond this crescent, a circular road links up all the radiating streets, while at right-angles to the axial line at the north end of the Market Place runs a wide straight thoroughfare from east to west, connecting with various diagonal streets, and completing the general framework of the town. This road leads directly to the district of Muhlburg, and to the docks of Rheinhafen, which put the town in communication with the much used water course of the Rhine. Sufficient of the early 18th century buildings remain to enable one to form a fairly good idea of the effect that would have been produced if the town had been entirely built up at that period. It would be difficult to imagine a greater contrast than that between the style of this town and that of Rothenburg. The straight, formal lines of the streets, the geometrically shaped *places*, the axial treatment of the Market Place, the regular, horizontal sky lines, and the entire absence of gables, with the symmetrical and regular treatment of the facades, all emphasise this difference, and yet, there is the same feeling of unity of effect, the same sense of scale and framework leading up to a definite town centre that marked the more picturesque and irregular Rothenburg.

Much skill was shown in the treatment of the many acute and obtuse angled corner buildings, a very good effect being frequently obtained by very simple means. We cannot fail to notice how such a regular treatment suffers when the style is departed from, and buildings of different heights and different characters break in upon the orderly arrangement, and, I think, we should take warning, and before embarking upon any system which depends for its success on the complete maintenance of very regular lines, make fairly sure that we can see our way to maintain these.

The site of Karlsruhe is a level plain, having apparently nothing of natural undulation or feature within the area of the town, which needed to be much considered by the planner, so that probably in this case the unusual degree of formality of treatment was justified by the conditions. The faults of the plan are the excessive and monotonous insistence of the somewhat uninteresting tower of the Schloss, the large number of acute angled corners and the uncomfortable shape of many of the *places*, road junctions, and building plots formed.

Its virtues are the definite leading up to a centre, and the interest which each part derives from being a portion of a definite scheme, the easy communication from point to point, and the simplicity of the general framework, which is easily grasped.

Bearing in mind the comparison we have made of the formal 18th century city with the informal 14th century one, let us pass to consider in greater detail some of the component parts. We have seen that both plans are alike characterised by an extensive use of *places* of various sizes and forms. The special characteristic of the medieval *place* is the sense of enclosure and the completed frame of buildings which is produced; the shape is indefinite. In the Market Place at Nuremberg, for example, although at first sight there appears to be many roads leading in to the place, and forming breaks in the buildings, it is remarkable how the arrangement of these does, in reality, leave the framework of buildings unbroken. Either the roads are curved slightly after they leave the Square, or their direction is broken, or they are made to pass out at right angles to the line of vision so that it would hardly be possible to stand in any part of the Square and get a long, unbroken vista out of it. Contrast with this the modern Max Josef Platz, Munich, where the long straight vista at the side of the theatre breaks up the frame of the buildings and gradually destroys any sense of enclosure in this part of the *place*. The Piazza del Campo, at Sienna, is another instance of a place of quite irregular form on plan, in which so far as its shape and arrangement are the result of conscious design, the aim appears to have been mainly to secure the sense of enclosure, and an unbroken frame of buildings. This, of course, was easy with the narrow streets common in medieval times, in which a very slight deviation from the straight line is enough to close the vista. The Market Place at Stuttgart, is an example of this. We have only to imagine two modern 50-feet streets replacing the narrow ones shown on the slide to realise how, unless they were very rapidly deviated from the straight, the sense of enclosure in that *place* would be entirely destroyed.

In Renaissance *places*, quite different effects were aimed at, regularity and symmetry of shape and architectural treatment are in them the prominent features, and the sense of enclosure is sometimes wanting.

The importance of linking up the buildings and producing to some extent a continuity of frame, was, however, apparently recognised in the laying out of the fine group of Renaissance *places* at Nancy. Where the angles or ends would otherwise have been open, they have been to some extent screened by wrought-iron railings, masses of foliage and semi-circular loggie or arched gateways. But the importance of enclosure and linking up of the buildings has not always been recognised in the planning of architectural *places*, particularly those resulting from, what I may perhaps call, axial treatment. It is not, of course, the only desirable effect to be produced in a *place*, but there is a peculiar sense of completeness and unity and a suggestion of quiet and repose which results from this treatment, which it is most desirable to maintain in many *places*. The Amalienborg Platz, at Copenhagen, is a very fine instance of an architecturally treated *place* in which no attempt is made to secure this element of definite enclosure in the *place* itself. A monument stands on the intersection of the centre lines of the two cross roads, and the four palaces which face diagonally upon the *place* are each completed by lower wing buildings affording something of the gateway treatment to the roads themselves, and giving a fine sense of unity to the whole effect. But in reality, this *place* may be regarded rather as the glorified treatment of a street junction than a *place* in the sense in which we have been using the word hitherto.

The Karolinen Platz, at Munich, is another example of the treatment of a multiple road junction, with a central feature on the axis of the various roads, and with definite architectural treatment of the corners, but lacking any sense of enclosure. In such *places* one is not tempted to loiter: they are apt to be distinctly draughty. From these one naturally passes to consider *places* formed mainly for the purpose of facilitating traffic. Many examples of these may be found in Paris; at points where several roads converge there is usually formed some open space to facilitate the circulation of traffic, and to secure some degree of architectural treatment to the corners of the various streets. The Place de l'Etoile is the largest of these. The whole question of the circulation of traffic, and the best way of reducing the inconvenience which must always arise in busy streets, where several streams of traffic pass in and out or across the main lines, is too large for me to touch upon to-night, and I can only say, in passing,

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that there are two widely different views held on the matter. The German school of modern town planners believe that as far as possible multiple road junctions should be avoided, and each branch street is better brought singly into the main street. They consider that many single junctions disturb the flow of traffic less than a fewer number of multiple junctions. On the other hand, the French school of town planners consider it advisable to give long, straight, unbroken streets, converging at certain points where the traffic can rearrange itself all at one point, and pass off in many directions; and in some cases, as in the Place de l'Etoile, it has been suggested that the best way of dealing with the traffic is to keep it always moving round the centre point in one direction, which, although it obliges a certain portion of the traffic to take a rather longer route, avoids the lengthy stoppages of first one stream and then the other, which are otherwise necessary at crowded crossings.

(To be concluded.)

THE METHODS OF PAINTING ON STUCCO.*

(Concluded from last week.)

THE mural painter with great regret substitutes the short and hard zinc for the plastic lead with its clinging nature. The oil process with white lead has been used in countless masterpieces, and ever will be. When protected with varnish, age only mellows it. But white lead is deadly when used in quantities, and is foreign to the nature of the lime itself. It should therefore be decidedly rejected for all mural painting upon lime: directly lead and lime come together they rob each other of qualities necessary to stability.

Great attempts have also been made to consolidate the lime by the aid of soluble glass. Water glass was first produced in Germany in 1828. Made from sand with an excess of alkali, it is soluble in hot water; when cold it becomes a kind of varnish. In application it is both mixed with the colours and sprayed upon the face of the painting. If sprayed upon a surface colder than itself (like as varnish will) it goes milky. One sad example of this is said to have occurred to the grand historic paintings by Maclise in the Houses of Parliament. To protect these magnificent works of art when finished a surface of water glass was applied to them. Alas! in the application of the silicate (a purely mechanical affair) it became chilled, resulting in the production of a white opaque film which obscured the work. Varnish had then to be resorted to to reveal the painting, which is objectionable, and as gloss partially hides a large painting whose whole extent should be seen without any obscurity.

Great efforts in research upon this important subject have been made in Germany. Some years ago Professor Schlotthaer, an artist, and Councillor Fuchs, chemist, produced a system which they claimed would defy all tests, even that of acid. Only water was used in the application of the colour; all the pigments could be mixed together with the medium, and would keep moist any length of time till applied. They did not change in drying, and one painting could be passed over another. This ideal process appears to have been founded upon the water-glass method, and is a secret. Wilhelm von Kaulbach carried out his immensely grand frescoes with the aid of this medium.

Lately a German process has been introduced into this country, called the "Keim method." It has been advocated in lectures by Robert Austin and the Rev. J. A. Rivington. Some important work has been carried out in this method. It is claimed that it possesses all the advantages belonging to the before mentioned German process without the secrecy. The fixing fluid alone appears to be a secret, and is supplied by Keim, of Munich. Professor Austin allows the use of all the pigments. The Rev. J. A. Rivington, in his lecture on this process which he gave in the theatre of South Kensington Museum, counselled the worker to restrict himself to the following:—Zinc white, chrome green, the umbers, light red, ivory, black, barytes, chrome red, the siennas, yellow ochre, chromic oxide, zinc yellow, cadmium, terra vert. He also advocates the use of grey instead of white lime. As a criticism the yellow ochre is not necessary; raw sienna will answer the purpose. As to the chrome green, if is meant by this a mixture of prussiate of iron and acetate of lead, surely it is an objectionable colour to use on lime, as the use of grey lime would not detract from richness of colour, while white lime is an aid to sweetness and purity of tone.

There is a tendency in this process to reduce body in the pigments. In order to restore this, and also to help to render them permanent, the following composition, to be mixed with the colours before applying them, is recommended:—Barium carbonate, calcium fluoride, aluminium hydrate, silicic acid.

Sometimes a difficulty occurs in obtaining this last. It can, however, be produced by dissolving sodium silicate with hydrochloric acid, then filtering it, and finally washing it on a piece of rag. It is then in a fit state to mix with the pigments. There appears in these new processes an endeavour to give to the artist the use of all the pigments he is used to in oil painting, regardless of whether they agree with the lime or no. It appears we cannot get away from established procedure or custom.

Each and all of the "tempera" methods are proper for lime, and superior to the oil process for mural work, since oil always darkens. Still, the buono process has hitherto resulted in the finest quality of colour. This master manner has resulted in grandeur and permanence. Our climate, however, demands a method which will counteract its destructive power, a process suitable for paintings of great expanse, one which will unite facility of application with permanence, and permanence with beauty of colour. What grandeur there is in those buildings in which the painting, and even the modelled work is all of lime, the walls of a church, for instance, instead of forming an opaque contrast, uniting with the windows in one glow of bright reflecting colour, possible only when the principal ingredient of both coloured modelling and painted work is all of lime.

The President (Mr. G. DESPIERRES) said they had all listened with pleasure to the paper, and they would certainly consider it a very interesting reminiscence of the laborious way in which ancient artists and artisans produced the lasting and delightful results which were still to-day remarkable examples of their admirable skill and wonderful perseverance. He could not, however, help expressing his regret that the lecturer had not given them the benefit of his experience with regard to the application of paints on lime, plaster and cement walls of modern times. They must not lose sight of the fact that the conditions under which mural decoration was carried out in the twelfth and thirteenth centuries were very different to those of the present day. With our ancestors, he said, labour and time appeared almost as negligible quantities, whereas to-day they were of the utmost importance. They must all admit the charm and lasting effects of some of the mural painting to be seen in a fair state of preservation in Italy and France, but scientific investigation had revealed that some of the delightful blues, full of warmth and depth, had been obtained by applying from twenty to thirty successive coats of finely ground glass coloured with cobalt salts; they were therefore at once faced with the difficulty of finding the artist and artisan who would be prepared to do such laborious work, and more especially there would be greater difficulty in finding the generous patron to pay for it. The lecturer had told them of the importance of lime being well and completely slacked, and that opinion was shared by most of them; but the old Italian method, he thought, would not appeal to the modern builder and decorator. The mania for speed affected everybody and everything, and dwelling-houses were expected by the owners to be decorated and habitable a few months after the foundations had been laid.

Mr. C. E. WILKINSON said they fully appreciated the labour which the lecture had involved, but it seemed more an art criticism than a practical demonstration, and he had hoped by the title of the paper that it would have been the latter.

Mr. J. G. MACINTOSH thought stucco was used for making images and ornaments, and he had expected to hear how colour was applied to them.

Mr. A. S. JENNINGS said he had been misled as to the meaning of the word stucco. He thought it meant the plastering of the outside surfaces of a building in order to imitate stone. He would be glad, he said, if the lecturer could tell them how to deal with such stucco work and how to treat it in the best possible manner.

On the motion of the PRESIDENT, a hearty vote of thanks was accorded the author of the paper.

Mr. FOURNISS, in his reply, said the modern decorative trade method of covering up the bright lime surface with coats of white lead tinted with all and every pigment was as unscientific as it was inartistic. It was as fatal to the colour as it was to the worker. There was no affinity in the outward skin of paint material and the lime ground to which it was applied, clinging as it did to the surface by the aid of oil. When the oil decayed the alien film returned to dust; a coat

* A paper read by Mr. William Fourniss before the Paint and Varnish Society on November 4.

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of varnish would prolong its life, but the gloss revealed the inequalities of the wall, hiding portions of it. In order to cause the finishing colour to be without gloss the general trade practice was to give the work a final coat of colour made up of the volatile turps to which had been added a minute quantity of varnish, resulting in that most delicate of surfaces called flatting. It could not be touched without damage, and any repairing was impossible. Such a method the author held was not only a misuse of colour, but it was also misnamed, since the ancient name of flatting was "distemper."

FIRE-RESISTING CONSTRUCTION AND FIRE.*

IT is with considerable temerity that I, a layman, appear to-night to address a body of professional gentlemen on the subject of our meeting. I do not intend, however, saying much by way of instruction because I recognise it would be presumption on my part to offer advice upon a subject which is engaging the attention of the building world. I propose to demonstrate by the lantern slides the effects of fires upon buildings, from which I am sure you will be able to draw conclusions far more satisfactory to yourselves than anything I could tell you.

My experience has led me to the conclusion that it is not so much the matter of material as of internal arrangement of areas, floor spaces, partitions and divisions, that is all-important in determining how far a building with its contents will resist effects of fire within its walls. The non-inflammability or otherwise of constructive material can have no retarding effect, for instance, in a light goods warehouse, where the floors are arranged in a series of galleries round a well through the centre of the building. And yet the materials in such buildings are carefully selected on the most scientific principles.

The disposition of spaces, partitions and, above all, the particular uses to which the building is intended to be applied, are the governing factors in fire-resisting construction. It is erroneous to apply the term to the structure alone. I am inclined to the belief that no building, of whatever nature, stocked with highly inflammable goods, when once the stock has got well alight, will withstand the effects of the fire without sustaining serious damage to its stability.

I propose to show you the effects of fire on various building material, by which you will see that whilst under certain inexplicable conditions where a particular stone or manufactured material will come out of the ordeal in one instance, it disastrously fails in another.

A most essential and deciding factor in a building during a fire, and which forms an important bearing upon the stability of stone and other material, is the air currents. Most materials, subjected to excessive heat in a still atmosphere, with a gradual rise and fall of temperature, will not be seriously affected; but if the same materials are subjected to sudden alternating currents of hot and cold air, the effects of expansion and contraction play havoc with walls and supports.

I will first take as an illustration the effect of fire upon what is commonly supposed to be an exceedingly reliable and "fireproof" requisite to most buildings, especially in Scotland, viz. a stone stair.

I may perhaps better illustrate my contention by explaining that, as you gentlemen all know, a stone stair has its slabs embedded in the wall. The effects of a sudden application of heat to the projecting portion of the slab causes it to expand; that portion of the slab which is embedded in the wall is not so suddenly affected, and if it were it could not expand in the same ratio as the projecting portion: as a consequence the expansion causes a fracture at the edge of the wall and the projecting portion falls to the ground. What makes the stone stair unreliable under these conditions is that it is not essential that the stone should become in actual contact with flame, but the heat set up by fire in another portion of the building is sufficient to collapse the stonework. I have repeatedly seen at fires in large houses, where the stone stair has been taken up to the second or third floor, and continued thence to the top floor by a light wooden stair, the stonework has collapsed into fragments and the wooden stair at the top, where the greatest heat has been generated, has been almost wholly unaffected. On the other hand, a common white wood stair often remains in position, and what is left of the unconsumed timber is sufficient to admit of firemen passing over it with safety. A hard-wood stair, say of 1-inch treads, filled in with pugging or deafening and a soffit of good plaster on the underside, will withstand the effects of actual contact with flame for the whole period of a fire, and, unlike stone, it is not affected by cold air or water. It is the sudden alternation of heat and cold which causes stone to collapse.

Of all material used in building construction, and particularly for stairs and unprotected landings, stone is the most dangerous when subjected to the effects of fire. The position as well as the composition of stairs is an important matter to consider in designing buildings, particularly those of a public character, where large numbers of the public are to assemble. The stair-well should not be within the main building, but should be attached; it is also a mistake to enclose these stair-wells within four walls; the top outer half of each landing should be open to let off smoke or vitiated air. The size and number of stair-wells should be determined by the number of people likely to require to use them. The common stair in an ordinary tenement in Scotland does not add to the comfort or safety of the residents; a fire occurring on the lower floors causes the upper floors to be filled with smoke. Most common stairs are not ventilated at the top, consequently all the smoke escaping into the stairs from the house in which the fire has occurred has to be cleared off through the houses on the top floors. From a sanitary point of view the same thing applies.

It has often occurred to me that, instead of running the front wall of tenements up to the top in an unbroken line, balconies should be formed on each landing, the top half of which would be open to the air. The stairs would always be ventilated, no draughts flowing up under the doors, and no accumulation of vitiated air on the top floors. Such an arrangement would be an immense advantage in case of fire, because only the particular house on fire would be affected by the smoke, whereas with an enclosed stair, as at present existing, a fire on the lower flats means that the whole of the residents above have to turn out and are often rescued from suffocation from the windows. I might also suggest that ornamental balconies would be a break in the monotony of our long rows of flat-walled tenement streets.

It should be borne in mind that stone stairs will not prevent smoke and heat flowing up the stair-well, and that, no matter what may be the construction of the stair, no human being can face the heat that would cause a wooden stair to burst into actual flame, consequently a wooden stair that will remain intact under all conditions is safer than any material that is affected by heat or cold.

The results of fires in different parts of the world have demonstrated most clearly that there has not yet been constructed any special class of structure that has withstood the ravages of a conflagration. It is difficult to say what constitutes a really fireproof structure. I think it may be safely concluded that given a building of any material, and fill it with combustible stock, if that stock becomes thoroughly well alight and inaccessible to modern fire-fighting appliances, the building will be destroyed. Metal construction has failed, almost every variety of stone has proved to behave disastrously when exposed to a fierce fire, and of all building material good, sound, and solid timber, though doomed in the end, has been found to withstand the effects of fire longer than iron or steel. One trait in its favour is that it is neither distorted nor deflected by the heat. A wooden beam must be consumed to the breaking point before it gives way. Sound and seasoned timber gives far greater security and stability to a building on fire, and permits of the fire being attacked from within.

As an illustration of this contention, I take the case of an ordinary tenement in Scotland. It is very rarely that a fire spreads from one floor to the next above, and yet the very commonest of building material is employed.

The exposed surface above the fire, in the first place, is common, and often inferior plaster ceiling on wooden lathing nailed to the underside of the joisting; the joisting is rough, of the 9 by 3 standard; then you get the deafening, a luxury rarely met with in English houses. The deafening is often non-inflammable or very slow combustion, but it serves the dual purpose of not only checking the fire, but it also blocks up the air spaces and prevents the flow of air and flame between the joisting and protects the under side of the flooring of the flat above.

As you, gentlemen, all know, this class of construction is of a very common order, both in point of view of quality of material and workmanship. Tenements which are run up at the cheapest possible price do not admit of very much in the way of specially selected and seasoned material. The internal divisions and the method, rather than material, are responsible for rarity of large fires in tenement buildings.

* A paper on "Effects of Fire on Fire-resisting Construction," read by Mr. A. Pordage, Firemaster of Edinburgh, at a meeting of the Edinburgh Architectural Association at Edinburgh on December 1.

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For large external walls stone has proved to be absolutely unreliable. In the early days of my career in the fire service in London, fires in the older warehouses of brick and timber construction were always followed up from floor to floor, without consideration for falling floors and bulging walls; but the introduction of unprotected iron for supports and joisting altered the complexion of fires entirely. The deflection and buckling of the girders bulged and brought down walls, and concrete slabs used as flooring frequently did, and still does, more damage by wrecking than the actual fire.

Properly bonded brick with good mortar will withstand the fiercest fire, and, what is more noteworthy with regard to a brick wall, is that after all supports have either been burned or fallen away, the wall will remain in position for days after a fire. One striking instance of such a case occurred at the great whisky fire at Dundee in 1907. A brick wall 45 feet high and 40 feet wide, 18 inches thick, was the only one of the many party walls which withstood the effects of the fire.

Brick is least affected of all material, and will withstand the exposure to a fierce fire and application of water many times without detriment to its stability. I have not found in my experience any other form of construction of which the same may be said.

Concrete floorings, though incombustible, are not fire-resisting, and usually fail in the early stages of a fire; reinforced concrete has, however, remedied the defect so apparent in the early application of concrete.

Steel and wrought-iron columns, adequately protected, have in many instances failed most disastrously, and in others they have succeeded in keeping other ironwork intact. A mere coating of concrete is not sufficient; there should be two or three inches securely anchored to the column and girder, as in all cases air spaces, pipes and tubing should be excluded from the coating round ironwork. In fact, the coating should be solid; the expansion of piping and tubing bursts the coating and exposes the iron.

If concrete is of a satisfactory aggregate, and is thickly coated and anchored on to steel and ironwork, it is contended that unequal expansion of either material is almost impossible. I am of opinion that reinforced concrete of brick, slag or cinder aggregate is satisfactory for floor construction, and will withstand fire better than any other form of metal construction yet introduced.

We have not had very much experience yet with reinforced concrete, as it is practically a recent introduction; but in the great American fires of the last few years this particular construction has stood the test better than anything else.

In dealing with the fire-resisting properties of buildings, it is, of course, important that the construction should be such as will retard the spread of a fire from one section to another, and a word in the direction of the growing tendency towards extraordinarily high steel frame building may not be out of place. Our building regulations have so far kept the dimensions of these buildings within reasonable limits; but, owing to their apparent fire-resisting properties, there is an inclination to follow the American methods. Already in London there are several such buildings of ten and twelve floors. Buildings beyond 80 feet may be considered to be beyond the immediate resources of modern fire appliances. Consequently, when a fire occurs beyond that limit, it cannot be so readily attacked, it has longer time to get ahead before being reached, and the chances are that the fire will spread amongst the upper floors of adjacent buildings.

This class of building has a large surface of wall opening enclosed by glass, which affords no protection from outside fires. It is due to this fact that the great fires of Baltimore and San Francisco spread so rapidly. The fire, travelling with the direction of the wind, passed through the window openings, out of the top of one building into another, jumping over the spaces occupied by smaller buildings, which latter in many cases escaped entirely.

Taking the structures apart from the contents at the Baltimore fire in 1904, most of the frame buildings, which were burned out in so far as the contents and fixtures were concerned, and whose skeleton frames remained, cannot be said to have behaved satisfactorily. The top floors, which were inaccessible to the fire-fighting appliances, acted as fire conductors, their stone and ornamental dressings were stripped by the effects of the heat, making the work of the firemen below extremely hazardous. An extract from the report of Chief of Engineers of the United States of America says, "The exterior walls of many of the so-called fireproof buildings ought to be taken down; all of them are more seriously damaged than appears."

Of the lessons learned by experiences of fire-resisting buildings we have to go, amongst other things, to America for the best information on record about building material, and I propose to give a few extracts from the excellent report presented to the United States Government by the special committee appointed to report on the great fire of Baltimore in 1904.

The report says:—"For exterior walls, both stone and terra cotta suffered severely. The effect of fire on terra cotta was a surprise; it was thought that architectural terra cotta for external walls was reasonably fireproof, but it failed completely at this conflagration. It cracked and fell to pieces, and the heat seemed to destroy its texture; in some cases it became soft and pliable. More particularly was this the case with projecting and highly ornamental work."

With regard to internal fireproofing, the report says:—"The only successful partitions were of brick: these lost their plaster, but were otherwise undamaged. Of hollow terra cotta partitions 85 per cent. were destroyed. Metal lath and plaster failed everywhere. Coke breeze or cinder concrete behaved admirably: in many instances where the flooring had not been subjected to damage by wreckage the cinder concrete floor remained solid and intact." It is important, however, with regard to coke and cinder aggregates for concrete that all combustible and partly consumed coal be rigidly excluded.

I have experienced several instances where coke breeze concrete has become incandescent. In addition to its fire-resisting qualities, it has the advantage of being superior in lightness to all other forms of concrete.

Stone of every description suffered severely, particularly projecting parts.

Terra cotta facings and ornamental work failed completely.

Granite spalled badly—worse than any other stone under moderate heat.

Marble spalled badly, but not so much as the granite.

Of materials used in exterior walls, properly bonded brickwork was the only thing that was successful. The only successful partitions were brick walls, which lost the plaster, but were otherwise undamaged.

Nothing can convey more clearly the value of the fireproof construction in a fire than one of the quotations contained in the conclusions of the special committee of the National Fire Protection Association of the United States of America, which says:—"It may be expected that in fires of great severity the steel frame, its protective covering, the walls and floor arches alone will remain, and even these will be more or less damaged according to the character of the construction and materials used.

"The contents of a fire-resisting building, without proper subdivision and no adequate protection against exposing fires, are scarcely any safer as regards destruction by fire than if contained in a building of ordinary construction."

These conclusions, arrived at after careful and exhaustive inquiry in the results of the various building constructions, prove conclusively that the tall steel-frame built fireproof building acts as a fire conductor when the contents of the building are alight and get beyond control of the fire equipment.

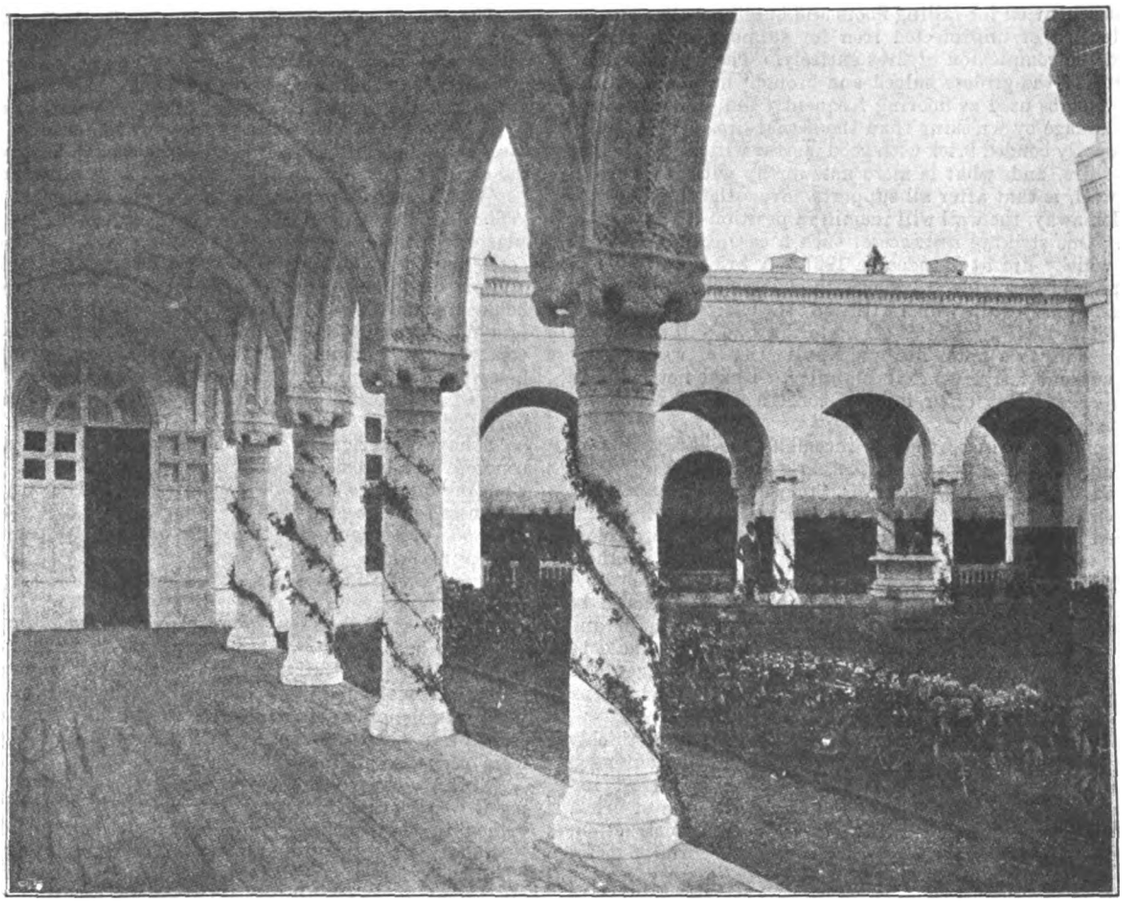
In support of the foregoing, a series of slides of the San Francisco and Baltimore conflagrations were shown, demonstrating the following effects of fire upon buildings:—

1. The failure of stonework.
2. The failure of hollow tile protection to columns.
3. The failure of hollow tile floorings.
4. The failure in some instances of reinforced concrete in frame buildings, and
5. The success of same material in others.
6. The success of brickwork generally in walls, brick partition, and brick columns.
7. Cast-iron columns, protected and unprotected, were shown to have failed completely.
8. Lattice girder supports were generally a failure.
9. Interesting pictures also showed the success and failure of both iron and armoured doors.
10. An interesting picture demonstrating the efficiency of wire glass as a protection from outside fires. Two lower floors which were so protected were intact, whereas the two upper floors in which the windows were of plain glass were burnt out.

The Trustees of the late Mr. Sutton are negotiating with the Liverpool Corporation for a part of their Lisburn Farm Estate as a site for some 150 model cottages to be let at rents such as would readily command tenants from among the poorest classes of the community. The trustees have still about two millions sterling available for the erection of model dwellings.

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MODERN EUROPEAN ARCHITECTURE.
SWEDEN.



[From *Arkitektur oj Dekorativ Kunst.*

THE LILLA GARDEN COURT AT STOCKHOLM EXHIBITION.—Ferdinand Boberg, Architect.

THE PRESENT ASPECT OF ELECTRIC LIGHTING.*

(*Concluded from last week.*)

IT may be objected that if there be no meter and no restrictions the consumer will waste the commodity. If the objection were valid the present system of water supply in London would be an impossibility. It must not be forgotten further that the longer the lamps are used the greater the cost to the consumer of lamp renewals, which thus acts to a certain extent automatically as a check.

As the station is charging per lamp, it must obviously also have some check on the consumer in order that he may not, for instance, substitute a 100-c.p. lamp for the 25-c.p. lamp allowed for. We prefer to do this by using special lamp-holders, such that only lamps which are sold by the station or its agents can be used. The consumer who comes back too often for lamp renewals will thus be detected and dealt with accordingly if it be found that he is wasting current.

Taking the average life of the lamps at 1,200 hours, they would use in that time, say, 36 units per 25-c.p. lamp. This at 0.4*d.* per unit represents 1*s.* 2½*d.*, and where the station sells the lamps, the profit on their sale would to a great extent automatically compensate for the wastefulness of any of its consumers.

It is obvious, therefore, that even with a wasteful consumer the station could not lose much, and a meter can, if desired, be put in to check in special cases any consumers suspected of wilful waste. For the reasons above set forth we believe that all stations having normally low running costs could, with great advantage to themselves, supply the long-hour consumer, who at present generally uses gas, at a fixed charge per lamp per annum, which would be well below what he is at present paying. The price will naturally vary for each district, but a fair average, inclusive of wiring rental, appears to us to be 12*s.* per 30-watt lamp per annum for a continuous supply, and 10*s.* per annum for a "dusk to dawn" supply.

This system we call the "Contract" system, to distinguish it from the "Contract Demand" system.

The proposal is, of course, by no means new, but it was practically an impossible one as long as we were restricted to the carbon filament lamps. The introduction of the wire lamp and the great reduction in the running costs during the past few years have, as we endeavour to show, entirely altered the position.

Credit must be given to Mr. Wilkinson, of Harrogate, for being one of the first to appreciate the altered position of affairs, he having introduced into his district the principle of charging small consumers by a fixed sum of 11*s.* per lamp per annum.

The contract system does more than simplify the clerical work of the station. It is one thing to go to a prospective consumer and explain that at the price you are charging electricity is cheaper than gas. In nine cases out of ten he will be sceptical, and will wait until he sees his neighbours' bills before he will come on.

It is quite another matter when you can go to him and say, "Come and look at this room lit electrically; you can have your house lit with the same lamps and can use them as you like for a fixed charge per lamp per annum."

If you can get over the difficulty of the first cost of the wiring you have in all probability secured that man as a consumer.

We are of opinion that in the future purely lighting stations will, in order to secure the necessary large number of new consumers, be absolutely forced, either directly or through a subsidiary company, to undertake the wiring of houses and to supply lamps—in fact, to sell light, and not electrical energy.

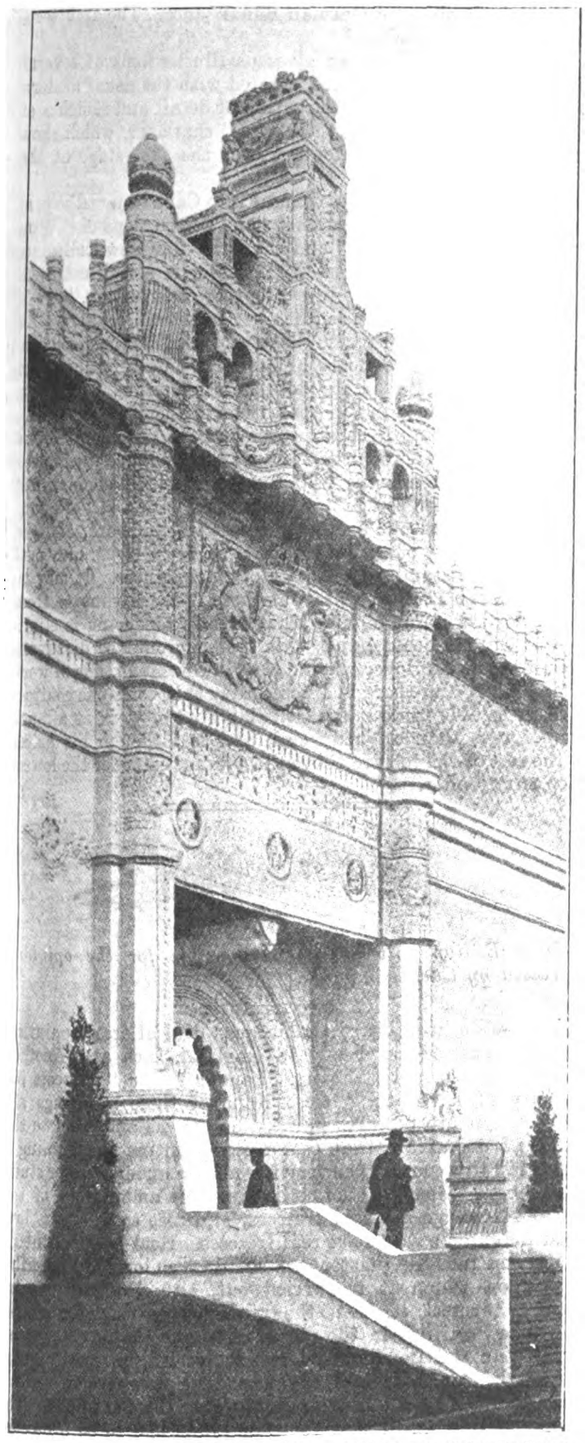
By this means any improvement in the efficiency of the lamp will be of benefit to the stations, and not, as at present, a loss to them. It will be in their interest to do all in their power to encourage the lamp makers, and to seek to give the maximum illumination for the minimum of current.

At present what do we see? Half the electrical world

* Abstract of a paper read before the Institution of Electrical Engineers, by Mr. H. W. Handcock and Mr. A. H. Dykes, members.

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MODERN EUROPEAN ARCHITECTURE.
SWEDEN.



[From *Arkitektur og Dekorativ Kunst.*

THE MAIN PORTAL AT STOCKHOLM EXHIBITION.
FERDINAND BOBERG, Architect.

counting their losses due to an invention which should have proved, and may yet prove, as great a benefit to the industry as it undoubtedly is to the consumer.

To bring this about, however, other innovations must follow the introduction of the wire lamp. Among others, it is all-important that the cost of wiring should be reduced, and, as many of the new consumers will have only a few lights, that the cost of services be brought down also.

During the past year or so considerable attention has been given to this problem, and a number of very excellent systems of economical wiring have been launched on the electrical world. They all have their good points, and it is for each engineer to select the one which best meets his requirements.

On alternate-current systems some form of concentric wiring with earthed outer is not only the cheapest, per se, but enables considerable economies to be effected in other directions. Only single-pole switches and fuses are required, and the insulation of the one pole can be abolished or reduced to a very small amount. Since the advent of the wire lamp a large number of concentric wiring installations with earthed outer have been put in, using a double-wound transformer, so that the supply mains are absolutely distinct and separate from the interior wiring.

Some might object that, as lamps of 25 c.p. are now available for 200 volts, the use of a transformer is unnecessary. It must not be forgotten, however, that even if nothing less than a 25-c.p. lamp is required, the price of the 200-volt lamp is 4*s.* 3*d.*, and of the 50-volt 2*s.* 9*d.*, or 16-c.p. 2*s.* 6*d.*, to say nothing of the greater durability of the lower-voltage lamp. The cost of a double-wound transformer is now so low that the saving on the first cost of the lamps is sufficient in most cases to cover it, whilst the saving in renewal of lamps, coupled with the efficiency of the lower-voltage lamps, amply suffices to meet the cost of the magnetisation units. Hence the difference in cost of wiring due to the use of one wire instead of two is pure gain.

The wiring can, by adopting one or other of the new systems, be brought down to 10*s.* to 12*s.* per light, or, say, 1*s.* 3*d.* per annum for upkeep, interest, and sinking fund.

Where the standing charges amuont to 17*l.* per kilowatt of consumers' maximum demand, a figure which is not likely to be exceeded by many stations, and allowing for 80 per cent. of the lights installed being on at once, a 30-watt lamp can be supplied for from 8*s.* 7*d.* to 10*s.* 2*d.*, or, including the free wiring, for 9*s.* 10*d.* to 11*s.* 5*d.* per annum. It is not likely that the average burning hours will be as high as 2,000, so that it is evident that an ordinary long-hour consumer can be supplied under these conditions for a sum not exceeding 10*s.* to 12*s.* per 30-watt lamp. As it is not proposed to put 30-watt lamps in the smaller rooms, a 10*s.* inclusive charge would in many cases be amply justified.

In suburban and country districts, for which the foregoing system is particularly suited, there is generally very little demand for current during the daytime.

Particularly with a small alternating-current station great economies can be effected if a supply be only given from dusk to dawn, the station being shut down during the daytime, and provisions are made under the Board of Trade Regulations whereby consent to this may be obtained.

In addition to the saving in labour at the station, the limited hour supply reduces transformer losses, and also prevents any waste of current during the daytime.

By using internal-combustion engines current can be quickly turned on in the case of fog or unusual darkness, under which conditions a supply is given.

In three districts for which provisional orders have been recently obtained it is proposed to work on this plan, and the necessary consents have in each case been given by the local authority on pointing out that, for the sake of one or two who wished to burn an odd light in the daytime, it would be necessary, if a continuous supply were insisted on, to increase the price to the great majority who only require light during the hours of darkness.

Of course, there is not quite so much gain if the station be run with steam plant as if gas or oil engines be used.

Whilst in most districts it will pay a man with only a few lights, which he uses in consequence for fairly long hours, to use electricity at the above price per 30-watt 25-c.p. lamp per annum to cover wiring charges and the use of current as required, the man with fifty lamps would find the charge too high. Nor, indeed, would it be justified, as we have assumed so far that 80 per cent. of the lights installed are turned on at once, whilst the consumer with a greater number of lamps will probably never use at one time more than a small proportion of his lights, the great majority of which will only be in use for a comparatively short time per annum.

To meet this difficulty we put in a limit indicator, ask the consumer to switch on the maximum number of lamps he wishes to use at once, and charge him, say, 12*s.* per 30-watt lamp, calculated on the number to which the limit indicator is set, and 2*s.* per lamp on the remainder to cover the wiring charges. He thus settles his own diversity factor and is charged accordingly.

This enables him to put in lamps where he naturally would not use them if he had to pay full price on all lamps, and at the same time obviates the absurdity one so often sees, viz. a station providing capital for free-wired lamps which do not even pay the annual wiring charges.

Another plan which has been adopted is to charge, say, 10*s.* per lamp for the first five lamps, 8*s.* per lamp per annum for the next five, 7*s.* 6*d.* per lamp per annum for the

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next ten, and 5s. per lamp for all above that number, the exact figures depending on the size of the average installation in the district.

Such a scale is in most cases, however, not so satisfactory as the first plan, as it assumes that the habits of all consumers having an equal number of lights installed are the same, which is generally far from being the case.

We venture to think that the future of electric lighting lies more especially amongst those consumers whom gas has hitherto claimed entirely as its own.

No gas company can afford to lay on gas, make a fixed charge per annum dependent on the number of burners, and allow the consumer to use as much gas as he pleases. We believe that an electric light company can deal with the consumer on this basis and make a profit out of it.

Comparing the present proposals with the conditions obtaining only three years ago what do we find? The standing charges of the station and mains per unit of candle-power capacity have, by means of the wire lamp, been reduced by nearly two-thirds; by using double-wound transformers interior wiring becomes single wire instead of double; a main cable consisting of a single No. 18 wire can, at 100 volts, supply all installations of twenty 16-c.p. lamps or under; the old double-pole distribution fuseboard is replaced by a single 5-ampere fuse; the meter becomes a memory of the past: a single service supplies a terrace of houses, and electric light commends itself to all long-hour consumers on the score of price independently of other considerations.

Probably in a very few years supply mains will be extended into most districts which till now have been neglected because they only contain small houses. The generating stations will use internal-combustion engines, which in many cases will only work during the hours of darkness, the supply being alternating-current single-phase at about 2,000 volts. Scattered houses will be supplied from transformers fed by tappings direct off the 2,000-volt mains, and the more thickly populated districts off the low-tension networks. The interior wiring will be put in by the supply company or their agents, and will be "earthed return." The lighting of the living-rooms will be by means of single 25-c.p. lamps, with plain white opal or similar shades fixed direct on the ceiling, thus giving a well-diffused light and avoiding risk of mechanical damage to the lamps.

Book-keeping and collection duties will be reduced to a minimum, as there will be a fixed inclusive charge of about 2s. 6d. to 3s. per lamp per quarter, paid in advance, and the first quarter's charge might with advantage be made to become due as soon as the house is wired.

On this basis capital will find in electric lighting as safe an investment as it does in water or other high-class securities, and as soon as this is realised not only the investor, but everyone connected with electricity, will reap the benefit.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* has an excellent special number on school houses, in which the latest development of school planning and construction as practised in the United States can be studied. Every British architect who designs a school should get a copy, as the American methods are full of suggestiveness. Particularly valuable are the detailed accounts of heating and ventilation. It is noteworthy that both in America and in Germany the fetish of the central hall with its many disadvantages is no longer worshipped.

La Construction Moderne illustrates a very commonplace smoking-room, which executed in padouk may look better in reality than in the drawing. A cottage or villa at Bethysy-saint-Pierre would hardly gain a prize in a *Daily Mail* Ideal Home Show though exhibited at the Salon, but the remaining illustration of a monument "Montanyas Regaladas," erected at Perpignan, is a remarkably fine piece of imaginative sculpture by M. R. Sudre.

Deutsche Bauzeitung gives us an example of modern German school architecture in the Schiller school with master's house at Fechenheim-on-Main, of which Herr Franz Thyriot is the architect.

Berliner Architekturwelt, in addition to its usual collection of views of domestic architecture, has a design in quite the grand manner for the new technical high school at Buenos Aires, by Ernst Reutsch and W. Brurein, of Charlottenburg.

Dekorative Kunst has discovered our own Arthur Rackham, of whose book-illustration work a well illustrated appreciation is given. The remainder of the number is given to arts and crafts rather than art with a capital A, but there is plenty of art notwithstanding.

Der Architekt describes and illustrates the new Post Office at Wiener-Neustadt, which with the general severity suitable to its function combines some piquant pieces of detail based on the Barock phase of German Renaissance. The architects are Theiss and Jaksch.

A Construcçao Moderna gives us illustrations of several mansions of considerable size, treated with the usual modern Portuguese inchoate conglomeration of detail and sketches of accessories of virulent "art nouveau" character, which show that the Peninsula has not got over the first stage of the fever.

Construction gives us an insight into Canadian methods of school planning with illustrations and descriptions of "Winnipeg's School Building," and the Brantford new Collegiate Institute. The Hotel Mossop, Toronto, is also illustrated, and is said to be "of absolute fireproof construction." We have not got quite as far as that yet in the old country. As the building is of steel frame construction with reinforced concrete and porous tile floors and porous tile partitions, our remembrance of Baltimore does not inspire us with overwhelming confidence in the absolutism of the fire protection.

The *Engineering Record* records how the Bureau of Sewers of the Borough of Brooklyn, New York City, have introduced a new system of tendering, which seems to us to have manifest advantages. Each contractor is supplied with a bill of quantities fully priced out by the engineer for the work, and the various tenderers simply quote their offer in terms of a percentage of the standard estimate of the engineer. It may be 90 per cent. or 110 per cent., but there is the advantage from an employer's point of view that erratic tendering is eliminated. On the other hand, this system would be disadvantageous to the employer where many and varied kinds of work are included, and there is a possibility that some one contractor may be able to do one particular kind of work at a much cheaper rate than anybody else, and so although his prices for the rest of the job are above the average can offer the lowest lump sum tender.

Correspondence.

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Fresco Painting.

Sir,—We have heard that a good deal of fresco painting has been carried out lately in England, such as "Another fresco in the Royal Exchange, London," and "Frescoes for the city of Liverpool," &c. None of these paintings are frescoes, but are pictures painted on canvas and fixed to the walls. I am afraid that real fresco-painting is becoming a lost art in this country, as very few artists understand or study the process. Some of the ceilings in the ambulatory of the Royal Exchange are real frescoes, and also some of the late Lord Leighton's works are real frescoes. Real fresco painting penetrates into the plaster and will last as long as the buildings upon which it is carried out, and does not require glass to protect it from the atmosphere—*vide* the above-mentioned ceilings in the Royal Exchange, which had been exposed to the London atmosphere for a great many years before the open court of the Exchange was covered with a glass roof. Also all fresco paintings on the Continent. The supposed frescoes in the House of Lords had to be protected by covering the same with glass, to save them from perishing (these were under cover). This clearly proves that they are not real fresco paintings. There are two ways of painting frescoes. Firstly on the fresh plaster before it sets, and this is a very tedious process as it has to be done in sections of say a foot or a yard at a time. The second process is to paint the subject upon a porous plastered dry surface with encaustic medium; care must also be taken in the colours used, as a great many are liable to perish and fade when used in lime. However an experienced fresco painter knows which colours will stand in lime. The well-known picture "The Last Supper," by the great master, Leonardo da Vinci, which was said to be a fresco, completely perished, but has lately been very cleverly and successfully restored to its original beauty by an Italian artist. Before painting with oil medium came into use most of the, to this day, well-preserved works, were done with encaustic medium—*vide* the old coloured work in Egypt, Greece, Italy, France, Germany, &c. Of course a decorative colour scheme can be got in mosaic, marbles, stones, and woods, but this is not so artistic, effective and lasting as fresco painting.—Yours obediently,

Henry H. B. Sang,
Architecte-Décorateur.

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The Architect.

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FORTHCOMING EVENTS.

Friday, December 17.

Edinburgh College of Art: Paper on "Architectural Education in America," by Professor A. D. F. Hamlin.

Institution of Civil Engineers: Paper on "The Foundation and Construction of Dock Walls" (students' meeting), by Mr. H. T. Tudsbery.

Monday, December 20.

Lancashire, Cheshire and North Wales Building Trades' Employers' Federation: Half-yearly Meeting at Liverpool.

Tuesday, December 21.

Institution of Civil Engineers: Discussion on "Railway Signalling in India"; and if time permits a Paper on "The Design of Rolling Stock for Smooth-rail Working on Heavy Gradients" will be read by Mr. F. W. Bach, M.Inst.C.E.

PRIZE DISTRIBUTION AT THE ROYAL ACADEMY SCHOOLS.

THE distribution of prizes to the successful students of the year was made on Friday evening last by the President, Sir EDWARD POYNTER, and this being a "gold-medal year," more than usual interest attended the function. The Royal Academicians present included Sir L. ALMA-TADEMA, Mr. F. DICKSEE, Mr. A. GOW, Mr. WATERHOUSE, Sir ASTON WEBB, Sir E. WATERLOW, Mr. G. D. LESLIE, Mr. MARCUS STONE, Mr. DAVID MURRAY, Mr. HAMO THORNYCROFT, Mr. E. CROFTS, Mr. GOSCOMBE JOHN, Sir LUKE FILDES, Mr. S. J. SOLOMON, Mr. E. A. ABBEY, Sir GEORGE FRAMPTON, and Mr. W. W. OULESS.

The President's address dealt chiefly with the abandonment of the principle adopted in the schools in 1903, of assuming that students when they came to the Royal Academy were already considerably advanced and fully equipped for entering upon the higher phase of their education. Naturally the President's remarks applied chiefly to the School of Painting, the principal object of the Royal Academy, and referred especially to the necessity for reinstating drawing from the antique to the place from which it had been temporarily deposed.

The following is the list of prizes and prize winners:—

Historical painting, "Dives and Lazarus"—gold medal and travelling studentship (200*l.*), Marianne H. W. Robilliard.

Landscape painting, "Fishing Boats Making for Safety in a Gale"—Turner gold medal and scholarship (50*l.*), Tobias Lewis; *proxime accessit*, Hilda Lennard.

Landscape painting, "The Bole of an Ancient Oak Tree, with a Wooded Landscape Background"—Creswick prize (30*l.*), Gladys M. Clark Kennedy.

Design for the decoration of a portion of a public building, "A Hunting Scene, Classical or Medieval"—prize (40*l.*), Hetty M. Bentwich.

Design in monochrome for a figure picture, "The Angel destroying the Assyrian Host"—Armitage prizes, first (30*l.*) and bronze medal, Louisa A. E. Canziani; second (10*l.*), James Williams.

Cartoon of a draped figure, "A Female Allegorical Figure of Winter"—silver medal and prize (25*l.*), Joan Joshua.

Painting of a figure from the life—silver medals, first, Leopold L. Swain; second, Frank C. Mitchell.

Painting of a head from the life—silver medals, first, Kenneth E. Wootton; second, Madeline G. Barker.

Perspective drawing in outline (open to painters and sculptors only)—no competition.

Set of six drawings of a figure from the life—first prize (20*l.*) and silver medal, Kenneth E. Wootton; second (15*l.*), Leopold L. Swain; third (10*l.*), not awarded.

Set of three studies of drapery—silver medal, Gladys M. Clark Kennedy.

Composition in sculpture, "The Expulsion of Adam and Eve from Paradise"—gold medal and travelling studentship (200*l.*), Alfred Buxton.

Model of a design, "Hercules Wrestling with Death for the Body of Alcestis"—first prize (30*l.*), Alan G. Wyon; second prize (10*l.*), Newbury A. Trent.

Model of a bust from the life—silver medals, first, Frederick J. Wilcoxson; second, Alan G. Wyon.*

Design for a medal—no competition.

Set of four models of a figure from the life—first prize (20*l.*) and silver medal, Alan G. Wyon; second (15*l.*), James Booth.

Design in architecture, "A Nobleman's Mansion in a Large Park, with Garden Terraces Down to the River"—gold medal and travelling studentship (200*l.*), Harry H. Jewell.

Set of architectural drawings, "Greenwich Hospital"—silver medals, first, Stanley A. Tuffs; second, William H. Gummer.

Design in architecture—prize (25*l.*), Harry H. Jewell.

Perspective drawing in outline (open to architects only), "The Strand Entrance to Somerset House seen from the Courtyard"—silver medal, Judah Weinberg.

Original composition in ornament (open to architects only)—not awarded.

Set of drawings of an architectural design—first prize (15*l.*), James G. Cooper; second (10*l.*), John L. Berry.

Architectural design with coloured decoration, "One Bay of the Nave of a Church showing Arcade and Clerestory Over"—silver medal, Basil Oliver.

Landseer scholarships in painting and sculpture of 40*l.* a year each, tenable for one year, have been awarded—in painting, to Ronald H. Greig, Dorothy W. Hawksley, Tobias Lewis, Douglas G. Shields, and James Williams; in sculpture, to Newbury A. Trent and Frederick J. Wilcoxson.

* Disqualified owing to having received the same prize before.

The subject of the design for the Gold Medal and Travelling Studentship of 200*l.* in Architecture was "A Nobleman's Mansion in a large park, with garden terraces down to the river." The mansion was to stand on a level plateau 30 feet above the river and 200 feet away from it, and was to have a frontage of 200 feet towards the river facing south, with an entrance courtyard on the north side.

Mr. HARRY HERBERT JEWELL, the author of the winning design, has certainly surpassed all the other competitors in the skilful lay-out of the environment of the mansion, which, we may take it, was an essential part of the problem, the actual house itself being part only, and not a predominant part, of the scheme. Whereas many of the competitors seem to have thought that the north side was the back of the house and of minor importance, Mr. JEWELL has recognised that this is the entrance front, and that therefore the design of the approach required particular

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care. By a skilful device of making stables and garage form two blocks as avant corps to the approach, and connecting these to the house by the familiar eighteenth century device of circular colonnaded loggias, the gold medallist has given piquancy and dignity to the main entrance.

In the mansion itself we find a practical as well as dignified plan, with plenty of internal effect and skilful variation of lighting of corridors and halls, by which a considerable amount of contrast in the chiaroscuro of the interior would be obtained.

The architectural detail of the design shows knowledge rather than originality, academical correctness in the use of well-worn motifs of a refined and coldly dignified character rather than vigour or piquancy.

Of the remaining seven designs Nos. 148, 150, and 153, in our opinion, come nearest to the winner; but though possessing more originality, vigour, and piquancy they have not the successful exhibition of the grand manner in planning the environment of the mansion that puts Mr. JEWELL'S work in front. Other designs are still further removed, and scarcely more dignified than would become the home of a successful trader or manufacturer.

Seven sets of drawings were submitted for the two silver medals offered for measured drawings of one of the towers of Greenwich Hospital, with one external bay to the side of the colonnade. These are of very equal merit, and the judges must have had some difficulty in awarding the first silver medal to Mr. STANLEY ARTHUR TUFFS and the second to Mr. WILLIAM HENRY GUMMER.

The 25*l.* prize for the best design executed in the School of Architecture between October 1, 1908, and July 31, 1909, has been won by Mr. JEWELL with a design for a branch bank, with offices above and a manager's house adjoining. This is on a corner site, and far more powerful in detail than the author's gold medal design. There are several other good designs among the twenty exhibited, and the freedom accorded to Royal Academy students is evidenced therein, in none, perhaps, more than in a design for a railway station in Modern German "new-art" mode.

Formal perspective drawing would not seem to be regarded with much favour by R.A. students, as there are only two competitors for the silver medal, which Mr. JUDAH WEINBERG wins easily, although with very good drawings.

The prize of 10*l.* for original composition in ornament executed in the school has not been awarded to the solitary competitor, whose full size model of a memorial tablet is coarse and lumpy, and only suitable for a position so far from the eye that the inscription could not be read.

The junior students exhibit twenty-one designs for the prizes of 15*l.* and 10*l.* for work done in the school. Mr. JAMES GOUGH COOPER takes the first with a rather clever attempt at a church tower in Greek, which has sufficient individuality while still reflecting the feeling of the Tower of the Winds and the Choragic Monument. Mr. JOHN LIONEL BERRY takes the second prize with a church tower based on the Romanesque manner, his design being in brick, with a moderate amount of stone; simple yet powerful in effect.

For the silver medal offered for the architectural design with coloured decoration of one bay of the nave of a church, with arcade and clerestory, there were only two competitors, and Mr. BASIL OLIVER scores an easy victory. The architecture is based on the Decorated period as regards mouldings and tracery, but simple and broad in treatment by the adoption of capless piers and much white stone, with a restricted amount of red brick. The principal colour decoration is a band or frieze between the nave arcade and clerestory, in which figure subjects of religious character are suggested. The windows have nearly all white glass, with mere spots of colour. The whole scheme is very satisfactory; but in execution it would scarcely be possible to find a red brick so unassertive in colour as the author shows. Mr. OLIVER'S only competitor should throw away the blue out of his colour-box before he makes his next attempt at colour decoration.

NOTES AND COMMENTS.

THE death of Mr. HENRY BAYLY GARLING, F.R.I.B.A., at the age of eighty-seven, removes one of the last survivors of the contemporaries of the great architects of the nineteenth century, of BARRY, SCOTT, STREET, and BURGES. Mr. GARLING was one of the selected competitors for the new Law Courts, though he was not then so successful as he had been in 1857, when he won in competition the first prize of 800*l.* for the best design for the new War Office, which, needless to say, he was not fortunate enough to carry out. Mr. GARLING won several notable prizes in his student days, including the Royal Academy gold medal.

THE decoration of the walls of Mansfield Street School, Manchester, by some students of the Municipal School of Art, is an example that is worthy of being copied. This particular work has been carried out at the instance of the Society of Friends of Art, with some assistance from the funds of the Royal Manchester Institution. Architects are only too willing for their buildings to show an alliance with sculpture and painting, but their clients cannot always afford the work of Royal Academicians, and the number of young students who nowadays, both in painting and sculpture, have sufficient ability and training to enable them to afford very efficient help in the decoration of public buildings is an occasion for their employment in such work as has been thus done in Manchester.

How art treasures become lost is shown by the experience of the Bangor Museum, the Museum and Library Committee of the Town Council having called attention to the discovery of a number of catalogues of old pictures. Works of REMBRANDT, RUBENS, RUYSDAEL, TENIERS, VANDYKE, GREUZE, QUINTIN MATSYS, and other famous masters were included; but the pictures have been so neglected that, from dirt and age, it is difficult to say whether they are genuine or not.

AN inquiry which Mr. H. SHELFORD BIDWELL, M.Inst.C.E., an Inspector of the Local Government Board, has opened at Bournemouth displayed a considerable opposition on the part of some residents to the Corporation's scheme for a pavilion or concert hall, reading and assembly rooms on the site of the Belle Vue and Pier Hotel, and upon land forming part of the Central Pleasure Grounds, for which the Council desire sanction to borrow 77,000*l.* Apparently the Corporation desire to make Bournemouth the Blackpool of the South Coast, which many private residents naturally do not desire. The Inspector was unable to conclude his inquiry, and adjourned the proceedings till January.

BURSLEM'S new Town Hall is not yet a certainty; but, despite the persistent opposition of a minority, the Town Council now seem satisfied that Burslem wants a Town Hall, that it can have the Town Hall, as designed by Messrs. RUSSELL & COOPER, at a cost of 25,000*l.*, and that it can afford the money. Hence a tender having been received at 24,918*l.*, the Town Council has "provisionally" approved the plans, subject to the decision of a town's meeting.

WE are glad to note from the first annual report of the Edinburgh College of Art that architectural students are taking full advantage of the benefits it offers. Omitting the general and indeterminate classification of "art students," who presumably have not fixed their future occupation, "architects' draughtsmen, apprentices, &c.," to the extent of ninety-two, exceed in number all other occupations attending the College except "house-painters, decorators, gilders, and apprentices," who number 152. In the section of architecture the diploma of the College is awarded to students on the satisfactory completion of a five years' course. It is a little curious that of forty-eight who entered in drawing only eight passed, whereas of thirty-six who entered in sculpture sixteen passed, which, unless the standard in the two subjects is very different, looks as if the architectural students need to pay more attention to drawing.

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OLD LINKS GOLF CLUB, ST. ANNES ON THE SEA.

THE Council of the Club recently invited a limited number of architects to submit designs for a new club house, and appointed Mr. ERNEST NEWTON, F.R.I.B.A., of London, assessor.

Premiums of 25*l.*, 15*l.*, and 10*l.* were offered for the designs placed first, second, and third respectively. The total cost of the buildings, exclusive of lockers and other fittings, was stipulated not to exceed 3,000*l.*; but in a supplementary letter a further sum of 1,000*l.* was allowed, with an intimation that preference would be given to the approved scheme nearest approaching the sum originally specified.

The accommodation required and approximate size of the rooms were as follows:—

A locker room for men, including juniors, to contain 350 lockers, with the necessary lavatory, bath, and drying accommodation. A locker room for ladies, to contain fifty lockers, &c., with separate entrance; ladies' tea room, with floor area of 340 super feet; dining room, 840 feet super; smoke room, 650 feet super; billiard room, 650 feet super; card room, 250 feet super; committee room, 350 feet super; kitchen, stores, servants' hall, steward, small sitting room for housekeeper, and four bedrooms for staff; professional's workshop and caddie master's office.

The selected design is that submitted by Mr. W. STIRRUP, F.R.I.B.A., of Manchester and Blackburn.

On visiting the present club house to view the drawings we found the design had been taken away by the author for the purpose of making alterations to the scheme, so we are not able to enter into any description of the design, and we can only give the following notes from the report (kindly supplied by the author) which accompanied the drawings.

After inspecting the site it was concluded that the verandahs, ladies' tea room, dining room, smoke room, and billiard room ought to have an outlook over the links, and that the caddie master's room, workshop, and caddies' accommodation should be placed between the club house and the first stence.

On the ground floor is a spacious entrance hall, and locker rooms for ladies and gentlemen, with separate entrances and verandahs, the latter being distinct, and separated by the projecting front of the ladies' tea room. The kitchen and service department are also concentrated on the ground floor and completely isolated. The office is centrally situated and controls both departments. The kitchen is removed from the central rooms to avoid nuisance by the smell of cooking. A special pantry for the preparation of ladies' teas, &c., is provided, adjoining the ladies' room and the service lift. The housekeeper's room is placed so as to control the ladies' and kitchen departments.

The first floor is approached by means of a central staircase, and has a large landing, from which is entered the dining room, billiard room, smoke room, and steward's room, the latter being attached to the bar and adjoining the dining room.

The second premiated design is by Messrs. J. B. PYE & DAVID BIRD, A.R.I.B.A., of Manchester.

On the ground floor, and overlooking the course, are centrally placed the dining room, lounge and smoke room, with a verandah extending from half-way of the dining room to the smoke room. In the rear at one end is placed the men's locker room, with a direct entrance, and the lavatory, bath, and drying rooms approached therefrom. In the rear at the other end is placed the ladies' tea room (with separate entrance), with the locker room approached therefrom. In this wing are placed the serving room, kitchen, scullery, stores, servants' hall, and steward's room. On the first floor are placed the billiard, card and committee, and secretary's rooms, and the staff bedrooms.

The design is compact and well arranged, but the secretary's office might with advantage have been placed on the ground floor.

The third premiated design is by Mr. G. FRASER, A.R.I.B.A., Liverpool.

In order to reduce corridor space as far as possible, the author adopted an elongated type of plan. In the centre on the ground floor are placed the committee room, the secretary's office, with the smoke room behind. On one side is placed a large gentlemen's locker room, with a smaller locker room beyond, and beyond the locker rooms are placed the lavatory, bath, and drying rooms, &c. On the other side of the committee and dining room is the ladies' tea room, with the locker room and lavatory, and the kitchen department. On the first floor are placed the billiard, card, and dining rooms. The principal entrance hall is small, and to approach the lavatories the members would have to go through both locker rooms and then retrace their steps.

Designs were also submitted by:—G. H. WILLOUGHBY, F.R.I.B.A., Manchester; Messrs. KELVEY & PENNINGTON, A.R.I.B.A., St. Annes; SIDNEY STOTT, Oldham; F. W. MEE, F.R.I.B.A., Manchester; A. ENGLAND, St. Annes; T. T. REES, F.R.I.B.A., Liverpool; F. GORST, Blackpool; J. CLEGG & SON, Oldham; A. HINDLE, Blackpool; JOHNSON & SELLERS, Manchester; W. L. GRUNDY, W. A. SHARPE.

Of the designs of the unsuccessful competitors noteworthy are those of Mr. G. H. WILLOUGHBY, who submitted two schemes. His scheme A. was well conceived, and the elevations were, we consider, the best submitted. In our opinion the question of cost has prevented the assessor from awarding a premium to this design.

Messrs. JOHNSON & SELLERS's scheme is very compact and simple in plan, but to have produced a satisfactory building the elevations would require remodelling in their entirety.

Mr. F. W. MEE and Mr. A. ENGLAND both submitted well-thought-out schemes, with drawings well drawn. In Mr. ENGLAND's scheme the element of cost has no doubt prevented his design being placed.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening last at Conduit Street, W., Mr. Ernest George (President) in the chair.

Mr. H. T. Hare, hon. secretary, announced the decease of the following members:—H. Bayly Garling, elected associate 1843, fellow 1857, and who was awarded the Institute silver medal in 1848 for an essay on sculpture and sculptural ornament. He gained the Royal Academy silver medal for measured drawings and the gold medal for architectural design. In 1857 he won the first premium of 800*l.* for the design for the War Office, the design being selected from among the 218 submitted. T. W. Cutler, elected associate 1873, fellow 1879. The deceased served for some years on the Council of the Institute until 1898, and had taken an active part in its affairs. G. Campbell Sherrin, elected associate 1882, fellow 1892. Mr. Sherrin served for some years on the art committee of the Institute. Although his professional work, said the hon. secretary, was familiar to many of them, it was not so well known as it deserved to be. All the buildings erected from his plans evidenced his sincerity for his art and the trouble he took to carry his designs to a successful conclusion.

Votes of condolence and sympathy were passed to the relatives of the deceased members.

Architectural Education in America.

Professor A. D. F. HAMLIN, in a lecture on this subject, prefaced his remarks with a brief retrospect of early American architecture when the most accomplished designers were amateurs. He referred to the decline in artistic taste which followed the Civil War period until 1876, when a rapid and general revival in the industrial and decorative arts was witnessed. Numerous technical schools were established, and although first attention was given to departments for mining and railway building, architectural education was also included. Although the architectural offices had often to employ foreign draughtsmen, the British system of pupilage never obtained any foothold in the United States. The youth starting his career as an architect began as office-boy, and picked up what knowledge of construction and design he could by an alert use of eyes, ears, and tongue. Yet notwithstand-

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ing the absence of pupilage, it was chiefly to the system of training initiated by Hunt and Ware that the United States owed the organisation and methods of its architectural schools.

In 1881 Professor Ware was invited by the trustees of Columbia College to undertake the organisation and conduct of a department of architecture upon the same general lines as that which had achieved such distinguished success under his guidance in Boston. That the proposed department should be attached to the technological faculty of the college which had grown up around the school of mines was a foregone conclusion. The department of architecture developed into a distinct school of architecture, though under the Faculty of Applied Science of the reorganised University, it was in 1902 made an independent school with a view to its later incorporation into a proposed Faculty of Fine Arts.

The present organisation of the course recognises three classes of students: first, those who aspire to the highest achievement in the profession, and to that end seek for a broad foundation of liberal culture through non-architectural studies before taking up their strictly professional courses; secondly, those who, without this broader foundation, desire to pursue a systematic course of architectural study for three or four years and to receive a definite academic recognition of their attainment; and, finally, young men, already more or less experienced as draughtsmen in the profession, who desire to pursue special studies in architecture while unable to afford the time or expense of the complete curriculum. Students of the first of these classes enter as candidates for the University degree and diploma of Bachelor of Architecture, upon completing, either at Columbia University or elsewhere, not less than two years of serious study in the ordinary A.B. course. Students of the second category, having had no collegiate training, are admitted upon passing examinations counting ten (or, after 1910, twelve) "units," of which three must be in mathematics and one in freehand drawing, the other six being selected at will from the following subjects: mathematics, French, German, physics, chemistry, history, and English. The requirement thus technically expressed means nearly the equivalent of graduation from a first-rate non-classic high school at about eighteen years of age. The mathematics required for admission cover arithmetic, plane geometry, and algebra through the binomial theorem, series, and progressions. The English preparation required covers not only grammar and composition, but acquaintance through certified reading with a selected list of the masterpieces of literature. These two items give an idea of the scope of the examinations, which are quite searching, and are conducted by a general inter-university board in June, in a large number of centres throughout the Union, and by the University itself in September in New York only. The third group are admitted without examination upon certification of having been for at least three years employed in architects' offices or in independent practice. Men of many years' experience sometimes avail themselves of this opportunity to make up for deficiencies in their earlier training or to profit by the latest instruction in architectural history or scientific construction. Students of all these categories, without exception, must furthermore give evidence by work submitted, or by a special test examination, of a fair mastery of the elements of the five orders, shades and shadows and architectural rendering in Indian ink. Those who fail in this test, however, if otherwise prepared and admissible, are allowed to attend all class-room courses and are given a couple of months in which to make up the deficiency under this test before being allowed to join their class in the draughting room. Columbia University is the only school which requires this preliminary test in draughtsmanship and the orders, and the proportion of those who pass it satisfactorily is still small, though yearly increasing. But the results in the school of its enforcement are most gratifying, for the time spent upon these purely preliminary subjects is greatly reduced, and the student started by so much the earlier on the exercise of his creative imagination in design. Students of the second category receive upon graduation a special diploma in the form of what is called the "Professional Certificate," but they receive no academic degree, and are not admitted to candidature for the M.A. and Ph.D. degrees. Those of the third group are called non-matriculates, and receive no academic certificate, though their passing of tests in the various courses they pursue is recorded in the University registers. The curriculum leading to the degree of Bachelor of Architecture comprises the following groups of studies:—(*a*) Mathematics and engineering, comprising analytical geometry, plane trigonometry, and differential and integral calculus, mechanics, graphical statics, and architectural engineering—a specialised course in strength of materials and the calculations for masonry, columns, beams, and trussed constructions, with specific problems to be worked out in full; (*b*) architectural history, including a three years' course in the history of architecture and the history of ornament, with at least one year of reading in archæology and architectural history in French or German; (*c*) office work and specifications, comprising parallel courses in the materials and forms of building and in specifications, and a certain amount of certified work in architects' offices; (*d*) drawing and modelling, exercises occupying from six to ten hours per week through the entire period of study, in architectural draughting, modelling in plasticine, and freehand drawing, from elementary cast-drawing to life-drawing from the nude, and including a considerable amount of training in architectural water-colours; (*e*) graphics, comprising advanced shades and shadows, perspective, descriptive geometry and stereotomy; and finally (*f*) design, considered as the crowning feature of the course, the end and aim to which all other branches pursued are contributory. This course comprises lectures on the theory of planning, composition, colour, and decoration, and a graded series of problems beginning early in the first year of study and extending to the end of the course, culminating in the graduating thesis—the design of a building upon a programme selected by the student, upon which he prepares a fairly complete set of scale working drawings and specifications, with strain-sheets, calculations, and structural details of a given part of the edifice.

After many years of experiment, said Professor Hamlin, the system of training in design followed in the Columbia school had shaped itself thus.

The newly-entered student, already possessed of some slight acquaintance with the orders and of the elements of drafting, is for three or four months subjected to a further drill in these subjects, in order to be able to express himself with some freedom in architectural form. The orders are not treated as the sole language or the sole alphabet of the art, but simply as *one* form of architectural expression, and are carefully and thoroughly studied at the outset because there can be no free expression until one has mastered some one medium of expression. The remainder of the first year is then devoted to exercises in composing simple architectural structures with these elements: gateways, porches, vestibules, pavilions, and the like being the subjects assigned. The designs, carefully rendered with all shadows cast in Indian ink, are handed in at given times and criticised and judged by some member of the school staff. Upon the completion of a sufficient number of these introductory exercises—usually at the opening of the second year—the student is admitted to the lowest grade in the regular school competitions in design. There are three of these grades—the elementary, intermediate, and advanced. In each of these grades there are from five to seven or eight major problems given out during the academic year, and as many minor or sketch problems, the former requiring each from three to seven weeks for their completion; the latter one day only. The programmes for these problems are prepared by a committee consisting of the six teachers and honorary professors of design, who administer the three *ateliers* or drafting-rooms maintained by the University. The programmes are given out on a day set in the calendar, and the designs must be handed in on another set day, or they are not received at all. Shortly after this they are hung in a suitable exhibition hall and judged by a jury consisting partly of members of the committee and partly of practising architects invited *ad hoc*. The jury awards *passes* counting three "points," *mentions* counting four points, and *special mentions*, to exceptionally meritorious designs, counting five points; designs failing of a pass get no credit whatever. For the sketch problems only three or four passes, counting one point each, are usually allowed in any one judgment. A student is promoted from the elementary to the intermediate grade on acquiring nine points; thence to the advanced grade on acquiring fifteen points; and is permitted to begin his graduating thesis upon acquiring fifteen points in advanced design if a candidate for the degree, eighteen if a candidate for the certificate. The work on the thesis usually occupies two or three months.

Mr. T. G. Jackson, R.A., said a few points had occurred to him during the reading of the paper. The system of training which had been advocated, he understood, contemplated three classes of students, which he would call A, B and C. The first, A, went through a course in architecture and a course of further studies in subjects unconnected with architecture, the second qualified for a certificate of architecture only, but in time he could pass into the third class of general teaching. It seemed to him that the training in class A was based upon what to the speaker's mind was a confusion of ideas. General culture was one thing, and architectural training

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another. That men should graduate in arts and study architecture afterwards was reasonable, but to treat the study which qualified for a degree as part of an architectural curriculum seemed to him to be an intellectual muddle, and he could not help thinking that the system was inspired by a motive of which there had been instances in this country of trying to give a sort of adventitious respect to the dignity of the art of architecture by investing the student with a diploma in architecture. The description was an entirely fictitious one. The second class gave a more thorough architectural training than in A, but in the last class of all they had the simple practise in architecture of a student who knew already something about the art, and this latter class Mr. Jackson thought was the most useful of all three. He was, he said, the last person to decry intellectual culture; the more a man knew the greater was his intellectual pleasure, and the greater his usefulness to mankind. But general culture would never make a man an artist. If they looked at the history of great artists, sculptors, and painters, they would find that they had mostly risen from the ranks. The story of great architects was very much the same, and in classical times many of the great architects were slaves. Then, too, when they came to the masterpieces of mediæval art he imagined they were all made by men whom they would call illiterate. He maintained therefore that intellectual training should be indirect, and suggested that there was more hope for good architects rising from the two inferior classes which carried with them no university distinction or decoration, than from the first class, which carried with it greater distinction. He ventured also to say that perhaps too much stress was placed upon technicalities and design. Mathematics might be useful to an architect under certain conditions, but speaking for himself the speaker said a knowledge of mathematics need not extend beyond the first four rules. Those rules were enough to enable one to calculate the weight to be carried, and the strength that should be provided for, and beyond that the tables formulated by humane people sufficed for all work. Then as to technicalities. He did not think it was necessary to make them all important in a curriculum. Ventilation, drainage, engineering, and electrical matters offered extremely difficult problems, and he believed the architect who was wise saw that such questions were beyond what was actual architecture, and therefore sought the advice and co-operation of those who had made such technicalities their profession.

Mr. REGINALD BLOMFIELD, A.R.A., remarked that he could not say that historically Mr. Jackson was quite right on the matter of general culture. The architects of the Renaissance were men of reasonable culture, and some at least were highly educated men. He referred to the distinction between technical instruction and education, and said it was evident that in America they believed technical subjects in architecture were a matter of liberal culture. There were two ways of looking at education, the cultivation of the mind, or the acquiring by the mind of a vast amount of knowledge. Personally, said Mr. Blomfield, he preferred as an architectural student the man with a general education and a well-trained mind, to one with an ill-trained mind. He was surprised not to find stress laid upon draughtsmanship by Professor Hamlin. The American system had undoubtedly taken its inspiration from the Ecole des Beaux-Arts, where draughtsmanship to a large extent was essential. Another point in the training of architectural students, though it hardly applied to America, was apprenticeship. It was beginning to go out of fashion in England, a fact to be regretted, for he attached importance to it, believing as he did that apprenticeship developed that individuality which marked the character of work in this country.

Mr. JOHN M. SIMPSON proposed a vote of thanks to Professor Hamlin for his paper. Professor REILLY seconded the motion, and expressed his admiration for American work, the excellence and refined scholarship of which he believed was due to the growth of the large schools of architecture with their splendid equipment.

Professor F. M. SIMPSON concurred in this opinion.

Mr. H. H. STATHAM suggested that although the details of electricity, drainage, &c., were too complicated for one man to know, yet the architect should know all the principles of the specialists.

Professor HAMLIN briefly replied, and the meeting terminated.

The Epsom Board of Guardians have adopted plans prepared by Mr. A. C. Williams for a nurses' home to be erected on the east side of Middle House, at an estimated cost of 1,870*l.*, exclusive of the architect's commission.

TOWN PLANNING CONFERENCE AT THE GUILDHALL.

ON Friday of last week a well-attended Conference was held at the Guildhall, London, under the auspices of the Garden Cities and Town Planning Association. Delegates attended from the City of London, the London County Council, fifteen Metropolitan boroughs, thirteen county councils, forty provincial boroughs, thirty-five urban district councils, twenty-five professional and propagandist bodies. After the Lord Mayor had given an official welcome the chair was occupied by Mr. Godfrey Benson (Mayor of Lichfield and chairman of the Association).

The Secretary (Mr. Ewart C. Culpin) announced that a proposal would be submitted for establishing a central body for town-planning matters which should be representative of official, professional, and propagandist bodies, and render efficient and welcome service to any department or authority. Such a body would be entirely non-partisan and without any particular theories on such questions as land ownership or taxation. The Association, as the oldest organisation on town-planning lines, will organise the proposed body, which in addition to other functions would form an effective clearing-house of housing and town-planning effort and thus prevent any overlapping or undue rivalry. He suggested that the Conference, representing as it did so important a body of expert opinion, should authorise the sending of a message of congratulation to Mr. John Burns on the passing of the Bill, which at the very least marked the beginning of a new order of things in beautifying the towns and improving the life of the people.

Mr. Thomas Adams, late of the First Garden City, Ltd., read a paper on "The Practical Application of Town-planning Powers," which we will give in our next issue. A discussion ensued, in which Mr. J. W. Willes Bund (Worcester City Council), Professor S. D. Adshead, Mr. Kirkby (City Architect, Bradford), Dr. Freemantle, and others took part.

The meeting then adjourned for lunch previous to the second half of the Conference, which it was arranged should treat the subject of town planning first from the architect's point of view and then from that of the engineer and surveyor.

Professor BERESFORD PITE, F.R.I.B.A., introduced the subject of "Architecture and Town Planning," in the absence of Sir Aston Webb, R.A. He said that in the first place he wanted to remark on the happy position that they were now in since the Bill had become an Act, and therefore at once removed from the atmosphere of partisanship and party politics. It was a suitable occasion to bear testimony to the great debt the nation was under to Mr. John Burns for his enthusiasm, political tact and power, and above all for the strong sense he had shown of architectural dignity in the city. Mr. Burns's previous work on the London County Council in connection with schemes like the Strand Improvement and the new County Hall also deserved recognition in connection with this subject of town planning. But besides Mr. Burns there were others who should not be forgotten, as, for instance, Mr. Henry Vivian, M.P., who created the movement of co-operation in dwellings. Then again, London was under an enormous debt of gratitude to its great landowners. Generally speaking, practically all their garden squares and the dignified and spacious parks, which alone made dwelling healthy and possible in this city, were due to the private enterprise and personal expenditure of individuals who were now described technically as ground landlords. What London would be without the charms of Bloomsbury, Bayswater, Belgravia and Bow, without its spaciousness and without those gardens, it was difficult to imagine. Its great squares will go down to posterity bearing names like Grosvenor, Cavendish and Eaton, and will serve as monuments testifying to the public spirit and architectural qualities of their original layers-out. It was a matter of congratulation that that private expense had now resulted in public profit.

The subject of town planning might be thus divided:—(1) Plan the thoroughfares; (2) plan the sites; (3) plan for extension; (4) plan architecturally; and (5) education on the subject. London as we know it will be perhaps so soon choked up with disabled and derelict motor buses that it will be without any thoroughfares. When that comes about the means of locomotion will be either by tubes or by aeroplanes. Half a century of railway selfishness has killed our national instinct for roadway scheming, although it was undeniable that England might be well proud of her influence in the art and science of constructing railways. But no

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Londoner could be proud of a single railway bridge which crosses the Thames, or of the way in which access had been opened up to the great railway termini. Perhaps our geographical position was partly to blame for our neglect in cultivating the art of access. A glaring instance was to be seen at Dover, where the dismal tunnels and the miserable platforms formed such an inglorious entrance to the country.

In town planning it was the dumb needs of the multitude, the men in the street, that called for consideration. The planning of thoroughfares produces sites, and sites have to be created (*a*) for dwellings that shall be healthy and pleasant and, as far as possible, freehold, but conditioned by mutuality of covenant; covenants effected by legislation are less onerous and less personally restrictive than those arrived at by private owners. (*b*) Sites for public buildings. Those dignified and useful for Church and State should be central; as they bestow a certain increase of value on the sites adjacent, these would in an ideal new city belong to the municipality; there would also be a reserve of central park land for public uses. (*c*) Then would come sites for commercial purposes, such as shops with warehouses behind, and in connection with these factories, market streets and exchanges—all the streets being considered with a view to obtaining that mutual comfort and usefulness essential for commercial prosperity.

Town planning should be carried out with a view to extension—that is, for that growth which must be part of every healthy city. As with the growth of a city there is a tendency to seek for fresh air and landscape, it was to the interest of the town that such sites should be included in the neighbourhood. These inevitable extensions increase the difficulty of dealing with the central sites, and only by long prevision can they be provided for.

Then the town planning should be done architecturally—*i.e.* done with forethought, with economy, and with that sense of beauty which may be summed up in the word refinement. Architecture is the art of beautiful building, but so far the aggregate has never been considered. The best architect was he who not only considered the immense problem of a great building, but considered it as a combination of great buildings embodying each phase of the social and national life. It might well be supposed that it was too great a problem for one single mind. In a town designed by one architectural genius there would inevitably be a sense of monotony and sameness present. But at the present moment it was a subject for education rather than for doctrine. Lessons were to be learnt from many cities in this country as well as from those on the Continent. But to them London was the most educative of all. In London they could see both how to do it and how not to do it.

There were many different lines on which historical study of the subject might be undertaken. But a great opportunity had come to the present generation, and they would be reflected in the use they made of this Act.

Mr. Raymond Unwin said that in this town-planning movement they had to exercise great caution, lest in doing good they should also destroy much that was beautiful. There was in everyone a love of the city or town to which they belonged. It therefore behoved architects that in carrying out schemes for town extension they maintained local colour and the characteristic beauty. Town planning was finally an architectural problem. This contention was not meant to belittle the work of others, for it was most necessary to comply with the requirements of the engineer, the surveyor, the economist and the sociologist, who laid down the conditions under which architects had to work. But once the final stage of realisation was reached, it then became an architectural problem. The town, as we see it, is a group of buildings, the exact lines of streets being of secondary importance to the placing and massing of the buildings. It was undoubtedly true that the lines must be determined to some extent by the practical requirements; it was none the less true that the final decision of exactly how the plan is to be placed on paper must be faced as an architectural question, if anything of beauty such as the public had a right to expect was to result. The mere practical necessities, such as sanitation, had already been faced with the completest thoroughness in our suburbs; but it was because these considerations were not sufficient that the Housing and Town Planning Bill had been passed to-day. The ordinary by-laws go into great detail as to all matters of construction and sanitation, but it was beginning to be realised that something more than this was necessary if we are to have suitable dwellings, and so this Planning Bill had come into being. Into the planning of suburbs there ought to be introduced a certain dignity which will cling to people's affections in the same way as old buildings. The Bill begins at the right end, for it goes at once to those residential areas which are at present growing up round large towns without any consideration for after effects, being merely considered from the point of view of sectional and personal interest. It was time that it was begun to be realised that the individual's right place was as part of a whole, and that while striving for individuality it must also be seen that the parts contribute to the effect of the whole.

The subject might very well be divided into two divisions, viz. the planning of the main arteries and the planning of the small areas in between. Of course, once the broad lines had been laid down a great deal of detail ought to be left to be filled in by the individual initiative of those who will afterwards develop the future cities. The necessity for going slowly was exemplified in Germany, where many evils had resulted from too much being undertaken at first. The tendency towards monotony, for example, was only to be expected, since no man's ideas are big enough to fit a town which deals with many men. Therefore much might be left in the early stages in the development of site planning, it being enough if the main lines were laid down. There was one thing that the by-laws had done which needed to be carried very much further. Under the model by-laws it was not compulsory to give proper frontages to the buildings so that they may afford light and air to all the rooms. A very loud outcry was rightly raised against back-to-back houses, yet many of the houses erected in compliance with the regulations were back-to-back houses of the worst type. The question of roads ought to be gone into also. Many main roads, owing to the increase of motor traffic, are now anything but desirable for those who wish for peace. It was also absurd that a 40 or 50-foot road leading to a little group of buildings should have to be made exactly of the same standard as if it was intended to carry the utmost traffic.

Landowners had nothing to fear from the Town Planning Bill. There would certainly be a reduction in the number of houses permitted to be erected to the acre; this, however, would mean the spreading out of the city, and consequently the owners would benefit by the enormous difference in value that existed of land that was brought thereby within the margin of building land and that which is agricultural. Indeed, there was a danger that the effect of the Act would be, as in Germany, to send the values up, for it was undoubtedly true that neighbouring landowners would in course of time reap the benefit of being adjacent to well-laid-out property. Another danger was that if the owner were compelled to lay out his land in very new streets he would retaliate by erecting big block dwellings. Before setting anything on paper it was very advisable to receive all the suggestions that might be forthcoming, for once the plan is made they all come in the form of destructive criticism. It was important to remember that this matter was one for co-operation between the authorities and the inhabitants. It was to be hoped that the authorities would not follow the precedent of the by-laws when they tried to smuggle them through with the utmost secrecy and the least possible trouble. Such a course of action was only natural, as it involved less work; but it was not right, and operated very hardly on many people. It was only by co-operation between the various bodies concerned and the local authorities that the evils could be avoided and the full benefit reaped from the Housing and Town Planning Act, 1909, by which we shall build for ourselves dwelling-places worthy of rational people.

Mr. Paul Waterhouse said that, speaking as a representative of the Royal Institute of British Architects, he desired to thank the organisers for the opportunity afforded of associating architects with town planning. He suggested that all architects who are being trained in the special study of that subject would find no better learning ground than in the ancient City of London, full as it is of problems which must come in course of time to other cities. His own interest in the subject was only an academic one, being confined to a study of the way in which certain streets can be amended. It was not many years since the Royal Commission on London Traffic produced their wonderful Blue Books, but these are now almost forgotten and are being covered with dust. An excellent plan was produced, though nothing has yet happened. Perhaps it was not too late to hope that some day architectural genius might yet be brought to bear upon the work which the Commission carried so far without producing any practical result.

Mr. H. V. Lanchester, speaking on the subject of the Traffic Commission report, said that, while having every respect for their investigations, he could not help thinking

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that their proposals were entirely wrong and would fail to effect any improvement. In this country, unfortunately, garden suburbs were regarded as complete in themselves instead of as part of the great city out of which they sprang. This town planning by retail could not commend itself to any architect, for in their opinion the city and its suburbs should be considered as a whole. Provision should be made for the garden city growing into an integral part of the city. In his opinion the civic parks should be laid out on lines radiating from the city's centre. Town planners should also bear in mind that the city was something to be seen from without as well as from within, and therefore they should think how it would look from a little distance. Every great and important city wanted some dominant centre like the cathedrals of French towns, and St. Peter's in Rome.

CONFERENCE ON TOWN PLANNING AT WESTMINSTER.

A CONFERENCE on the practical administration of the Town Planning clauses of the Housing and Town Planning Act was held on Tuesday and Wednesday, December 14 and 15, at the Westminster Palace Hotel, London, S.W., under the auspices of the National Housing and Town Planning Council.

The Council placed before the Congress as the basis for discussion a series of suggestions as to the most practical lines of town-planning procedure adapted to great centres of population.

The following gentlemen co-operated in the preparation of this series of suggestions:—

Professor S. D. Adshead, Professor of Town Planning, Liverpool University; Mr. John H. Barlow, Bourneville Village Trust; Professor Berlepsch-Valendas, Munich; Mr. Albert E. Cave, London; Professor Eberstadt, Berlin; Professor Fuchs, Tubingen; Professor Patrick Geddes, Edinburgh; Ober-Baurat Geusen, Düsseldorf; Mr. E. M. Gibbs, F.R.I.B.A., Sheffield; Mr. T. C. Horsfall, Manchester; Mr. Percy B. Houfton, architect, Woodlands Colliery Village; Mr. T. H. Mawson, Windermere; Beigordneter Rehorst, Cologne; M. Augustin Rey, Paris; Mr. B. Seebohm Rowntree, Earswick Village Trust; Mr. Raymond Unwin, Hampstead Garden Suburb; Oberbürgermeister Wagner, Ulm; Mr. Percy Scott Worthington, F.R.I.B.A., Manchester.

The order of the suggestions closely follow the lines laid down by Mr. John Burns, who when speaking in the standing committee of the House of Commons when the Housing and Town Planning Bill was under discussion, thus described the various stages in the preparation of a town plan:—

(*a*) The placing by a local authority of a *primâ-facie* case for the preparation of a town plan before the Local Government Board.

(*b*) The holding of a preliminary inquiry concerning the need for action.

(*c*) The authorisation of the local authority to prepare a detailed plan; the issue of provisions relating to co-operation on the part of the local authority with the owners and other persons interested in the land; and the formation, if necessary, of a joint body of local authorities, where the land to be planned is in the area of more than one local authority.

(*d*) The holding of a local and public inquiry to fully consider the plan when prepared; and

(*e*) The formal authorisation and publication of the plan, which will then be in operation until superseded by another plan.

The Local Government Board take power under clause 55 of the Act to "prescribe a set of general provisions (or separate sets of general provisions adapted for areas of any special character) for carrying out the general object of town-planning schemes."

The suggestions were keenly discussed at the two sessions on Tuesday and at the final meeting on Wednesday morning, and were finally adopted as follows:—

SUGGESTIONS.

I.

We are strongly of opinion that before the *primâ-facie* case for the preparation of a town plan is drafted, most careful consideration should be given to the following points:—

(*a*) The extent of the area to be covered by the plan; and the local authorities which should be associated in the preparation of the plan.

(*b*) The clear statement of the objects to be aimed at in the preparation of the plan, amongst which may be suggested:—

(*c*) The different treatment necessary for manufacturing and residential areas, and the reservation of special areas for residential property only; the definite limitation of the number of dwellings per acre in residential districts; the provision of parks and open spaces and the preservation of all places of beauty or of historic interest; and generally the ordered development of the town as a whole.

[After general discussion the suggestions of the committee were carried unanimously without any alteration. One of the points raised was that the Act gave too narrow an interpretation to the meaning of "areas."]

II.

For this preliminary work of inquiry we would suggest that a town planning committee should be appointed by the local authority wherever practicable, and that a limited number of leading citizens specially qualified to give advice on this point should be invited to aid in making inquiries.

[A proposal that the owners of land or speculators in land in the areas to be planned, or their solicitors or agents, should be excluded from such a committee was lost. One member pointed out that it would keep out many architects and agents. The constitution of the committee was keenly debated; some speakers advocated the introduction of co-opted members with votes, while others favoured the co-operation of outsiders without the votes. It was ultimately decided that the local authorities should arrive at their own arrangements.]

III.

The Preparation of the Primâ-facie Case.

As the consent of the Local Government Board to the preparation of a town plan will be conditional on the submitting of a well-prepared *primâ-facie* case at the preliminary inquiry, and as the decisions arrived at in the first stage will be of vital importance in stating the general grounds on which the later town plan will be based, it will be of great value to call in the services of skilled advisors to confer with this committee. These skilled advisors, in co-operation with the officers of the local authority, should be entrusted with the task of:—

(*a*) Preparing a brief statement of the actual line of town development and traffic tendencies in the past;

(*b*) Giving technical advice as to the best methods by which the proposals of the committee can be realised;

(*c*) Preparing a series of alternative suggestions giving simply the main lines of possible and desirable development.

(*d*) Preparing a contour model.

Special Note.—It is suggested that a complete plan of the existing town should be prepared showing such existing features as parks, recreation grounds, open spaces, cemeteries, unoccupied land, allotment gardens, residential, trading, and manufacturing districts; the houses erected during the last fifteen or twenty years.

It is suggested that this plan will be invaluable through all the stages of the preliminary inquiry, and that the graphic record of building developments will show the town's natural tendency of growth.

A report embodying the deliberations of the committee should then be prepared and placed before the Town Council, who will forward to the Local Government Board the *primâ-facie* case, and ask for the required permission to prepare the plan. The report should be also published so that the objects and aims of the proposed scheme may be made clear to the citizens generally, and written suggestions invited from individuals and local architectural, archæological, and other societies interested in public welfare.

[There was a general discussion on the above suggestions, especially on the proposal to call in expert advice. The town-planners of Germany had very strongly advised the preparation of contour models, which proved to be of the greatest value.]

IV.

The Preliminary Inquiry.

The Local Government Board will without doubt prepare a series of regulations relating to the scope and character of the preliminary inquiry. We would suggest that at this preliminary inquiry the skilled adviser and leading members of the committee should be called on by the town clerk to give evidence as to the need for the preparation of the plan.

[Carried without discussion.]

V.

The Preparation of the Plan.

With the authorisation of the local authority to prepare a town plan, the work of careful preparation of the actual plan will begin. For the purpose of controlling the preparation of the plan a town planning committee should be appointed by the Town Council.

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With regard to the work of preparing draft town plans for the consideration of this committee, three methods might be adopted:—

(*a*) The appointment of a well-equipped expert, or experts, to prepare a town plan; and

(*b*) The use of the services of the present officials of the local authority.

(*c*) The giving of substantial premiums for the best town plan submitted in competition.

Special Note.—The general opinion of the gentlemen preparing these suggestions is that the competitive system is not the best for this purpose.

It may be pointed out that it would be inconvenient, if not altogether impossible, for the permanent officials of corporations to be consulted on matters of detail by an unlimited number of competitors.

It is also the general opinion that the preparation of the town plan should be entrusted to one or more experts—representing the architectural and engineering sides—and that throughout they should act in collaboration with the borough surveyor and medical officer of health.

[As the meeting included a very large number of municipal representatives and officials there was a considerable body of opinion in favour of the exclusive use of officials as being the persons who alone thoroughly knew the existing conditions of the locality of which they had charge. After discussion, suggestion (*b*) was inserted; and a sentence to the effect that municipal officers had their hands too full to undertake any additional burden was deleted. The case of Germany was mentioned as affording proof that official engineers were glad of outside expert assistance from an architect in preparing town plans. As a profession, an engineer's training was too severely practical to lead them to the best possible results.]

VI.

Joint Action Between Local Authorities.

The exact stage at which joint action between local authorities should be secured is a point which we recommend the Conference to discuss.

In the preparation of most town plans it will be necessary to secure joint action between two or more local authorities, viz., the council for the town, and the council or councils for the adjoining urban and rural districts. The best stage at which this joint action should be secured is without doubt that of preparing the *primâ-facie* case.

The Local Government Board have power to deal with any cases of refusal to take part in a town planning scheme, but it is desirable that from the first there should be voluntary harmonious action.

[Carried without discussion.]

VII.

The Special Objects of a Town Plan.

The general objects to be attained by the preparation of a town plan will have been dealt with in the preparation of the *primâ-facie* case. These general objects will, however, need to be exhaustively discussed by the town planning committee of the Town Council or joint committee of Councils, as the case may be, which should invite and consider suggestions from societies interested in the improvement and amenities of the town.

The following points will doubtless be recognised as of fundamental importance:—

(*a*) The extent to which the town plan shall allocate special districts for special purposes.

(*b*) The extent to which the town plan shall define the roads in the unbuilt-on areas which will be included in the town plan, *e.g.*, as to whether the method of outlining every street shall be adopted, or the method of defining the main arterial roads, leaving the detailed planning of the areas to be determined later.

(*c*) The extent to which sites for public buildings, open spaces, playgrounds and parks can be provided in the new districts, and the preservation of all places of beauty or of historic interest.

(*d*) The conditions of planning under which roadways and footpaths of less costly construction and the abolition of back streets and roadways can be permitted, *e.g.*, by the planning of purely residential streets in which the traffic facilities needed will be so slight as to render possible great economies in road and footpath construction. The practicability of adopting a system of non-traffic streets in purely residential areas should be fully considered.

(*e*) The arrangement of the houses of various classes so that they are not rigidly divided, but have equal access to the amenities to be provided.

(*f*) The limitation of the number of houses per acre and the extent to which economies in road and footpath making may be permitted in consideration of the provision by owners of larger areas for gardens on any side of the dwellings and of open spaces.

[A town clerk present questioned whether the Act empowered a committee to allot one part of the town to residential and another to manufacturing purposes. It was also doubted whether it would be practically possible to so dictate to manufacturers as long as towns depended on the rates paid by them. Other speakers contended that if they lacked the authority and the desire to effect this amenity, then the Act was almost valueless. It was ultimately agreed to ascertain from the Local Government Board if the power now existed. In dealing with clause (*d*) many speakers advocated a narrower and more economical roadway for purely residential districts. The limitation of the number of houses was only possible, it was agreed, when the exact conditions of any particular area were known.]

VIII.

Conference with Owners of Land.

When the town planning committee of the Council have decided as to the general objects of the town plan and have clearly defined these objects, conferences must be held with the owners and other persons interested in the land proposed to be included in the scheme. We regard it as, however, of fundamental importance that before these conferences take place the town planning committee should have clearly defined the objects to be achieved and have settled upon the policy which in their opinion is the most desirable one in the interests of the community.

IX.

The Public Inquiry.

In the final stage—viz., that of the public inquiry—the help of leading citizens should be again enlisted for the purpose of giving evidence as to the great desirability of the amenities which it is proposed should be secured for the community by means of the town plan.

At this stage of the proceedings the council should have the warm support of all those who desire to secure the proper growth of the town. The need for this expression of the right civic spirit by leading citizens outside the city council will be specially great during the first five years of the administration of the new Act, for in these years the tradition which will govern the practice for the next thirty years will be created.

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 26, DR. A. MARSHALL MACKENZIE, LL.D., F.R.I.B.A.
NO. 27, DR. ALEXANDER ROSS, LL.D., F.R.I.B.A.

DR. MARSHALL MACKENZIE and Dr. ALEXANDER ROSS are two eminent and well-known Scots architects, but the former has also made his name known to Southrons as the designer of the Waldorf Hotel, London.

QUENBY HALL, LEICESTERSHIRE.—DETAILS OF PRINCIPAL BAYS.

THE east room of the south wing on the ground floor is described in "Nichols's History of Leicestershire" as being an unfinished room, and this may be the case, but the more probable theory is that the room was intended for and may be was used as a chapel, as there are no traces of a fireplace ever having existed in the same previous to the insertion of one brought about by blocking up the east window. Further illustrations of Quenby Hall will be given next week.

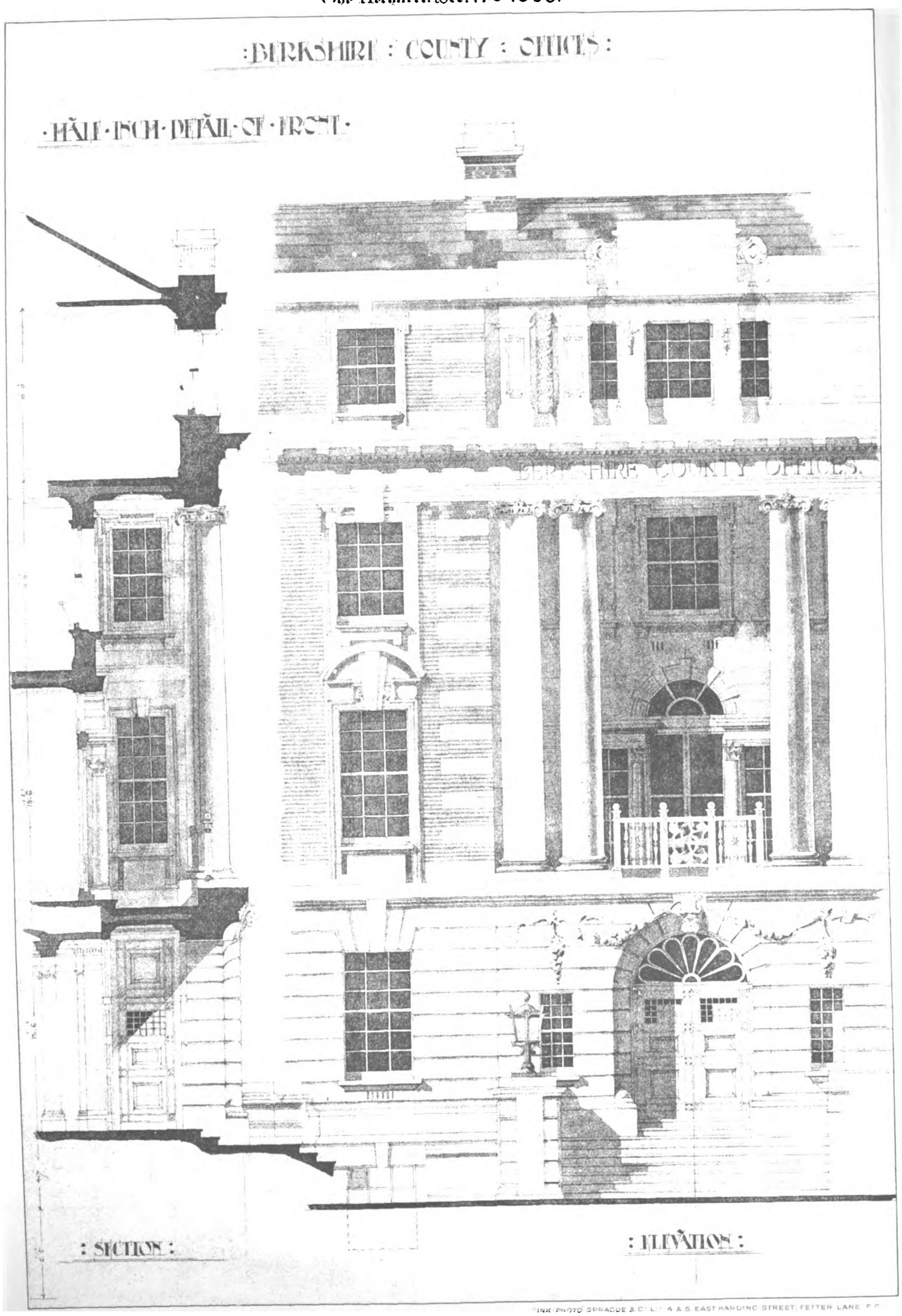
COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

THIS design, by Mr. HAROLD A. WOODINGTON, A.R.I.B.A., of 130 Jermyn Street, S.W., was submitted in the recent competition for new Council offices at Reading, and is an illustration of what might be termed central corridor planning. The detail drawing illustrates the principal entrance in Portland stone and red brickwork in narrow courses. The approximate estimated cost of this design, including alterations to existing buildings, amounted to 15,250*l*.

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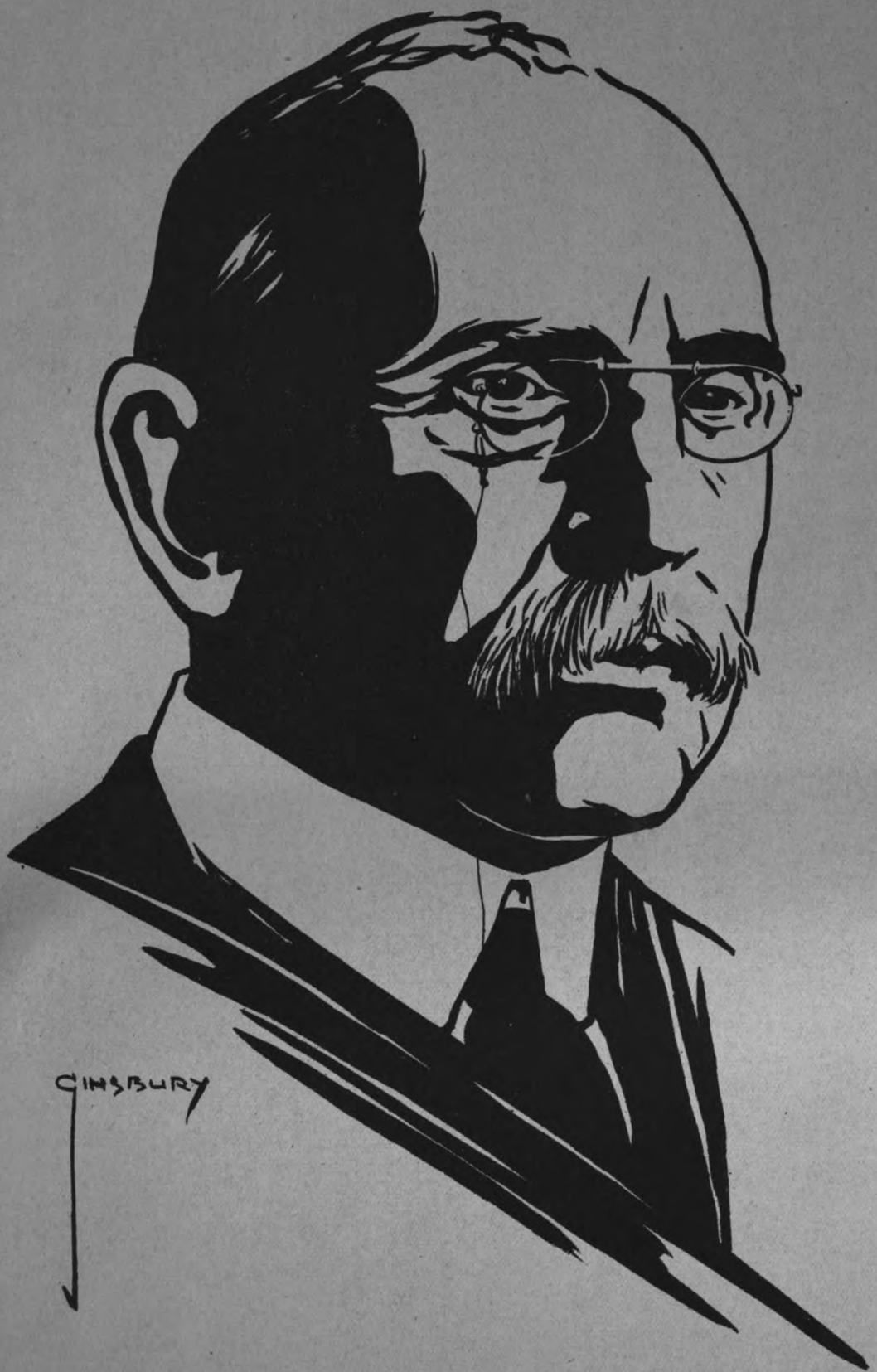
COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

HAROLD A. WOODINGTON, A.R.I.B.A., Architect.

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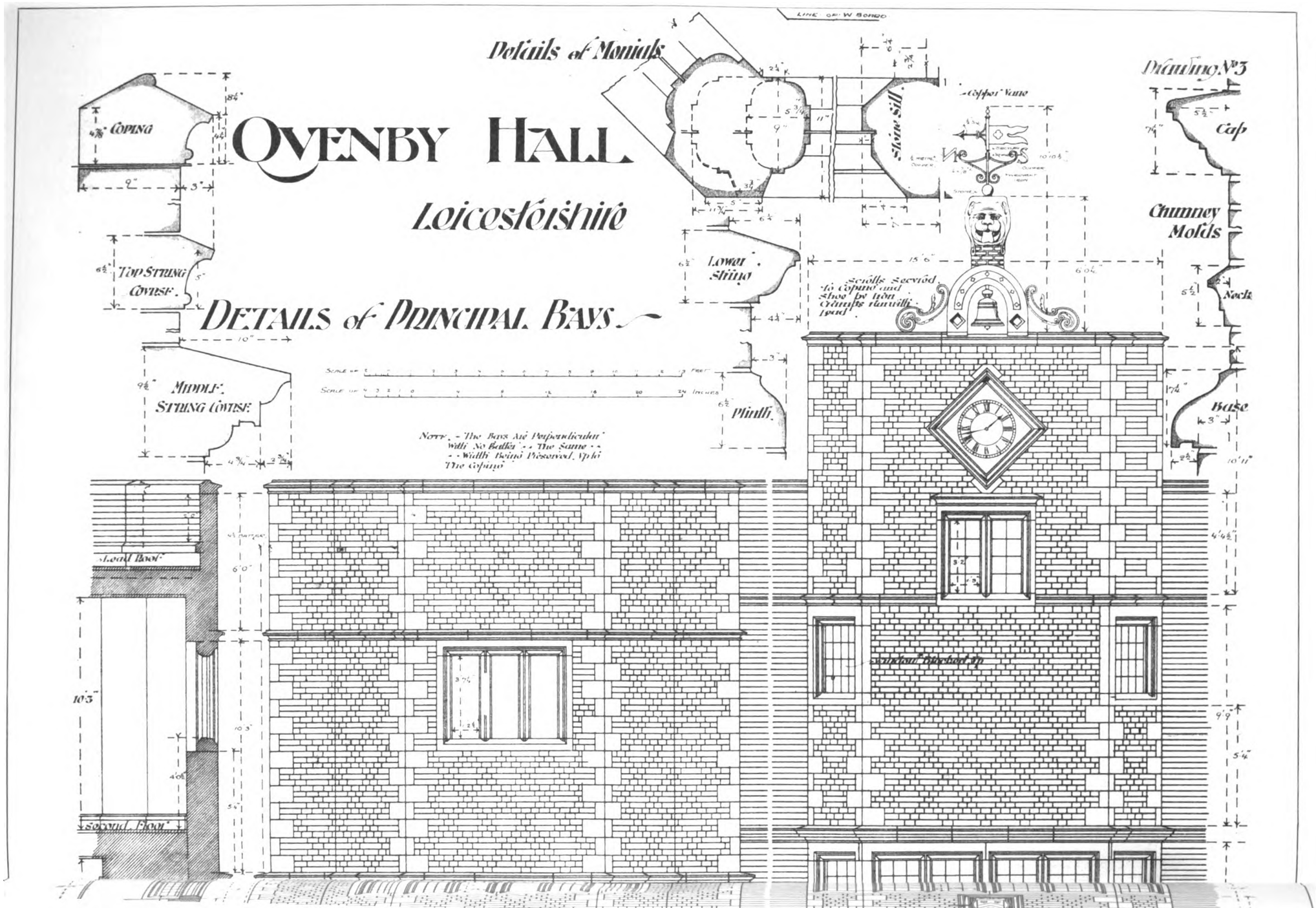


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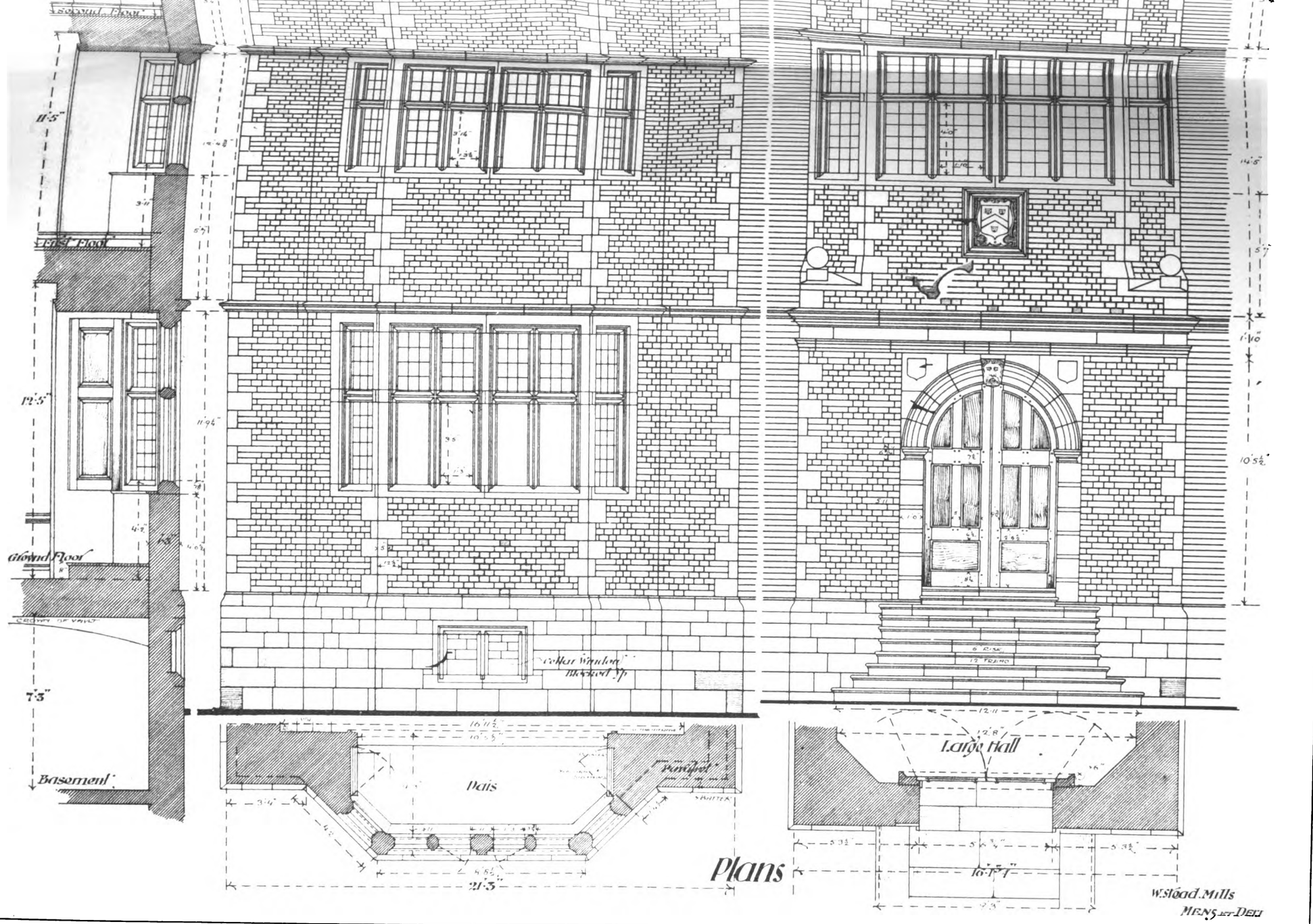


LIVING ARCHITECTS. No. 26: A. MARSHALL MACKENZIE, LL.D., F.R.I.B.A.

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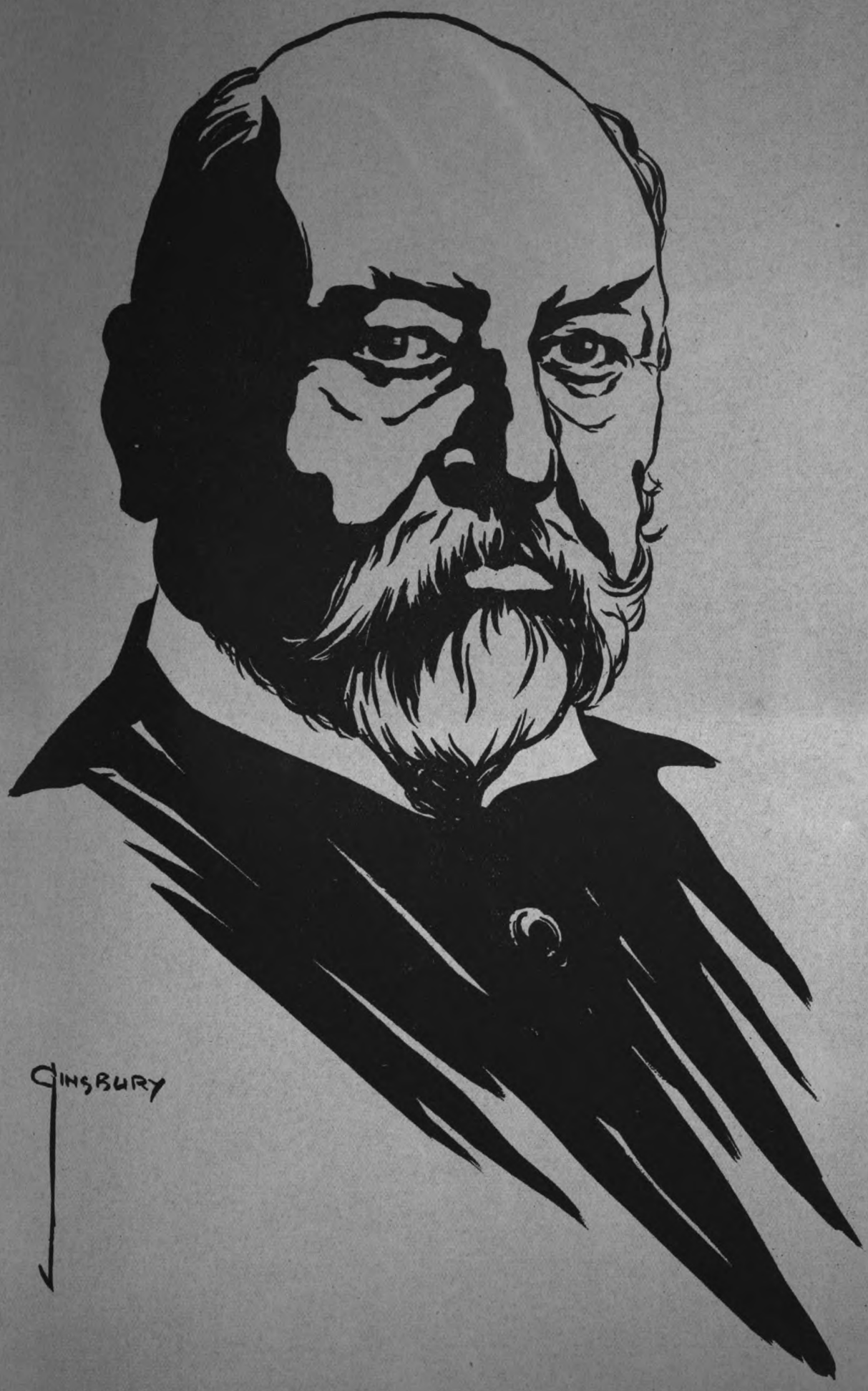


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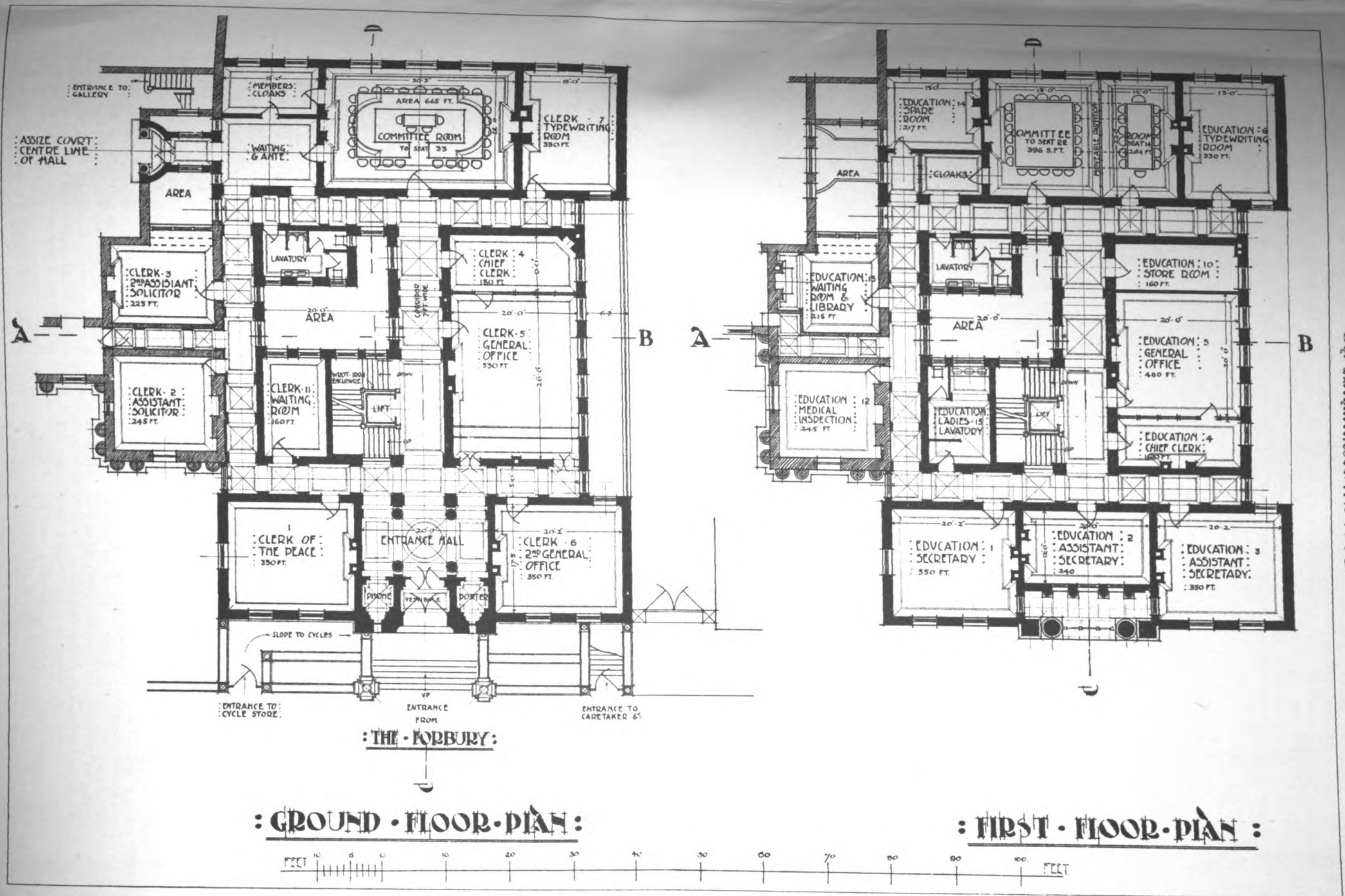
LIVING ARCHITECTS. No. 27: ALEXANDER ROSS, LL.D., F.R.I.B.A.

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UNIVERSITY OF CALIFORNIA

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THE FORBURY

GROUND FLOOR PLAN

FIRST FLOOR PLAN

The Architect Dec 17th 1909.

PHOTO-LITHO. SPRAGUE & CO. L.D. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

HAROLD A. WOODINGTON, A.R.I.B.A., Architect.

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TOWN PLANNING.*

(Concluded from last week.)

IN connection with the new St. Paul's Bridge, which will throw a considerable stream of north and south traffic across the already somewhat congested stream of east to west traffic, at the junction of Newgate Street and Cheapside, the authorities should consider whether it would not be worth while to test the circulatory system here. If it were found possible to open out this corner somewhat, there are the makings of quite a good *place*, and the lines of three, at any rate, of the roads, and of a fourth behind the Post Office, if this could be opened up, would strike the *place* like the arms of a turbine, which would render the circulating system peculiarly easy. A carefully made test as to the usefulness of the system would be very valuable at this moment, when we are about to enter upon a town planning period in this country.

But not the least interesting type of *place* is one which we may call the garden *place*, because it is the one which is likely perhaps to be most of use to us in the planning of town extensions, the part of town planning for which alone powers are given under the new Town Planning Act.

The Schloss Platz, Stuttgart, may be taken as a good example of this type, and in passing, we may use the example also to indicate in some degree the style of garden treatment suitable to *places*. In the first slide, I have purposely hidden the central garden by the plan of the place, and I would like you to notice how the simple masses of foliage left add to the dignity of the *place*. In the second slide, the same view is given with the garden portion shown, and I think it will be agreed that much of the breadth has been destroyed by the way in which the garden space has been frittered away and worried with fountains, bandstands, and geometrically patterned beds of variegated flowers. Here is altogether too much treatment, and in forms which although, no doubt, on paper they would make very pretty patterns, do not when seen in reality from the point of view of the ordinary spectator reveal much but undue fussiness. I am convinced that the breaking up of *places* with architectural balustrades, fountains, bandstands, &c., in the great majority of cases is a mistake. Such features have their place, but they should never be allowed to interfere with the general breadth and simplicity of effect which is so necessary, and which forms so much more dignified a foreground for the buildings surrounding the *place*. A plain sweep of grass, crossed perhaps by paved footways where necessary for pedestrians, following the simplest possible lines, with avenues or masses of tree foliage, when properly placed, is generally an effective treatment, and the money spent in so-called architectural embellishments would be usually better devoted to masking one of the street entrances with a gateway arch.

Where there is difference in level in the *place*, broad terraces with balustraded walls enabling portions of the ground to be levelled, may add greatly to the effect. But in garden *places*, as in gardens, it is necessary to be very clear as to the effect that is to be aimed at, and to be very cautious about introducing any mere embellishments which do not form part of a scheme definitely thought out to enhance that particular effect. Indeed, it is not only in the treatment of places, but in the whole work of town planning that we need to guard against being carried away by the prettiness of our paper plan. While the importance of definite design and orderly treatment is undoubtedly great, it is equally true that only by building up in imagination the pictures as they will appear to the beholder walking about in the streets, can we test our different proposals. Very often things which may look simple and uninteresting on paper will be much finer in effect than other arrangements showing a much prettier paper pattern. If I have devoted perhaps an undue proportion of my limited time to the *place*, it is because I wish to-night to emphasise specially the importance of introducing a sense of scale and proportion in town plans, and because I believe that a wise use of the *place* will, more than anything else, perhaps, help us to do this. We need a centre point to our design, nay, I would rather say we need many centre points; for it is not by jumbling together many materials and styles of building that we shall produce satisfactory variety in the large areas which modern towns cover, but rather by the careful selection of suitable centre points to each town, each district, each parish, and almost to each building site, or estate. Around these centre points the plan may be grouped, in relation to them the roads would be laid out, and the widths and treatment of them to some extent graded. Around them may be gathered the local public buildings. These centre points in turn may become the pride of the inhabitants, and may tend both to give expression to, and to foster local civic spirit and enthusiasm.

For important centres where the scale seems to need something larger than can wisely be adopted for a single *place*, the useful size of which is limited within fairly narrow lines, we may well take some suggestion from the groups of *places* which are characteristic of so many continental towns and which may be planned, as for example, at Salzburg, so that not only does the group form a much larger whole and afford opportunities for seeing the Cathedral to the best advantage from many points of view, but from no point of view is it seen without its due background and frame, in that naked isolation which we are so apt to choose for our public buildings. In large, gardened *places*, where the scale of the whole would tend to dwarf the buildings, the judicious use of masses of trees may have the effect of breaking up the larger *place* into groups of *places*, partially enclosed by the mass of foliage, and in this way the proportion between the buildings and this limited *place* area may be the one that will be felt.

In Salzburg, the *places* are irregular in shape, but the same principles may govern us in planning regular and architectually treated *places*.

For the town square at Letchworth, such an arrangement has been adopted, where a large garden square seemed most appropriate for the centre of a Garden City, while groups of smaller *places* surround the main public buildings, and the streets are arranged to command a view of these. On the same slide is shown a group of *places* adopted as the central feature at Hampstead, laid out on formal lines to suit Mr. Lutyens's Renaissance designs for the whole of the buildings.

Much that has been said of *places* will apply to streets also. The building up of street pictures is indeed a fascinating art, giving scope for endless variety of treatment. When it is desired to provide a route from one point to another, and no obstacle exists, nor do the contours of the ground suggest any deviation, the obvious course would seem to be to adopt the straight line. The advantages of the straight street are that it lends itself to the production of vistas, that where suitable terminal buildings can be provided at distances not too great, these buildings can be very well seen, also the straight street affords convenient building sites, and all the many conduits, tramways, &c., which form part of the engineering work of a modern town street are more easily laid in straight lines. The disadvantage of the straight street is that it is liable to become monotonous. The Rue Soufflot, in Paris, leading up to the Pantheon, is a good example, in which the terminal feature is of sufficient importance and interest. The length of the street is not very great, and the whole forms a dignified and beautiful street picture. But where a considerable terminal feature is lacking, and where the length of the street is great, the long converging lines of windows, cornices, &c., become not only uninteresting, but wearisome. When looking down a straight street, the buildings on either side for a short distance are seen at a sufficient angle for the features to be appreciated and to be interesting; but very soon, owing to the acuteness of the angle of vision, all the features, such as windows and doors, cease to be seen sufficiently clearly to have any interest, and become mere lines of shadow. Where a cross street occurs, a small portion of this vanishing perspective is replaced by part of the side elevation of the corner building furthest from the beholder. A little point of interest is at once introduced. In the diagram given, this point is emphasised by the different treatment of the two sides of the street, and it will at once be seen that by a judicious breaking of the building line, it is possible to fill the picture with the side elevations of buildings seen nearly square with the line of vision, so that the features are sufficiently well seen to afford interest and variety. In this way, by the introduction of suitable recesses or fore-courts, which afford an opportunity for planting trees, it is possible to build up quite interesting and picturesque views on a straight street, and to avoid any large amount of the picture being filled with the converging lines of the vanishing perspective. In the case of suburban roads, where the houses stand far apart in proportion to their height, the street view may with advantage be limited at intervals by bringing some of the buildings close up to the road line, and in this way the street pictures will be greatly improved, not only by the limitation in the distance, but by the framing in of the view.

The advantages of the curved street are that it can be more readily adapted to the usually undulating surface of our sites, and that there naturally springs up along it an ever

* A paper read by Mr. Raymond Unwin before the Society of Architects on the 9th inst.

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varying street picture. I cannot illustrate this better than by passing through the lantern a series of slides of the famous Oxford High Street, beginning from Magdalen Bridge, and terminating with the fine treatment of the Carfax Corner, carried out by Mr. Hare, when the increasing traffic necessitated the removal of the nave of the church. It will have been noticed from these pictures how the concave side of the street is the one that chiefly adds interest and variety to the picture, and the curved street is apt to lose on its convex side in proportion to the gain on the concave. If we examine a view of the Regent Street Quadrant, we shall see how rapidly the convex side of the street vanishes out of the picture. Comparing this with the concave side, for which I have chosen Mr. Norman Shaw's design, we shall see how the buildings on this side of the street are seen at a sufficiently wide angle for the interest of the features to be maintained right up to the vanishing point, and we may also judge of the fine effect which may be produced by a continuous horizontal treatment of a fairly regular curve. But it must not be supposed that a beautiful result necessarily follows from a curved street. There must be sufficient unity of effect and emphasis at the right points. Let me contrast a view of Holborn looking eastward, where we have a jumble of unrelated buildings and the minimum of unity, and where the curve of the street in the distance is marked by no feature of sufficient scale or interest to dominate the picture, with the Karolinen Strasse in Augsburg, where with much true variety of treatment in the buildings, a very much greater unity of effect is attained, and where the Perlach Tower and the Rathhaus beyond form a dominating feature just at the right point in the view.

I think we may say, then, that there is ample place in our town plans both for curved and straight streets, but their use should be governed by some definite purpose, and some definite effect in each should be aimed at so that we may neither carelessly continue our straight lines regardless of contours, nor imagine that we shall get a good effect by adopting aimless wriggles, merely for the purpose of avoiding straightness.

In the actual planning of our roads and streets, we cannot think only of the architectural effect to be produced. Rather, we must first think of the utilitarian purpose that the street has to serve, and find in each case such a treatment as will within the prescribed limits afford an opportunity for beautiful architectural expression of these particular requirements. While working on paper, we must always be thinking in the solid, for it is the massing and grouping of the buildings which we see and which affect our picture much more than the actual street lines; and it may often be possible to adopt quite independent lines for the buildings from those which are necessary for the road lines of the street. So important is it to consider the grouping of the buildings that after having determined in a general way the directions which roads must take to provide the necessary facilities for traffic, and to satisfy the engineering requirements, it will usually be found helpful to block out the design in buildings rather than in road lines; because within the very often fairly wide limits which would satisfy the practical requirements, the exact form may be determined wholly on architectural grounds. On residential roads much greater freedom of treatment is possible than in those solidly built up, and particularly those devoted to shopping and other business purposes, and in residential roads we encounter new difficulties, partly owing to the great width between the buildings, and partly owing to the tendency to employ detached or semi-detached units, each different from the others, producing a generally scattered effect in the areas devoted to larger houses, and to the equally monotonous plan of building long rows of smaller houses, all alike, and all alike uninteresting, in the streets devoted to smaller dwellings.

Under the new Town Planning Act it is in the ever-growing residential areas around our towns that the chief opportunity will be afforded. Centres of considerable magnitude and having buildings of fair importance will need to be provided, where whole new suburbs are growing up on the outskirts of towns; and to these the principles which we have been gleaning from the examples of different styles and periods will be as applicable as they are to those central portions of towns which are not affected by the new Act. But in all streets alike, whether residential or otherwise, we need to consider the total effect first, and the individual buildings as units contributing to that total effect. Much may be done by the careful designing of the building line to give to each street some definite character and unity, and this may be further emphasised by the adoption of definite building materials for definite streets or areas, a common roofing material being of itself enough to give a considerable degree of unity to a district. In the planting of streets also additional emphasis can be laid on the particular treatment adopted.

The tendency, which is becoming so marked, for areas to be developed by enlightened Garden Suburb Trusts, or by Co-partnership Societies, will afford opportunity for a greater degree of grouping of buildings. In streets of cottages and small villas one of the difficulties arises from the fact that the unit is so small and becomes so wearisome owing to the degree of repetition. A great improvement can be made where instead of rows of houses all alike, a number can be designed as a definite group, and this may be carried further, and three or more of such groups may be designed so that they form together a still larger group. Thus it becomes possible within limits easily practicable to create units in the street of sufficient size and importance to dominate the picture, although still composed of individual cottages each complete in itself, and with comparatively little variation in the plan and general arrangement. Such a larger group of three small groups of cottages built at Letchworth is illustrated on the screen.

With what a sense of pleasure and relief anyone wandering among the dreary ugliness that abounds in the neighbourhood of Southwark Street comes suddenly upon the little group of almshouses at the corner of Holland Street. These are as simple almost as the cheapest rows of cottages built, as they are of London stocks, relieved only by coigns; but it is the grouping of these almshouses around the simple grass court which takes approximately a cruciform shape that is so pleasing and affords such a contrast to the surrounding rows. Surely we may from such groups of tenements as these derive much suggestion for the treatment of residential buildings and roads. In these days, when the main thoroughfares are rendered dusty, noisy, and smelly by much motor traffic, it is eminently desirable that houses should be built just off the main street, and deriving inspiration from our college quadrangles, the groups of almshouses, or the closes of our cathedral cities we may, I think, add greatly to the pleasure of life in our suburbs, and to the interest of our suburban roads.

A few photographs and plans illustrating the attempts that are being made at the Hampstead Garden Suburb to work out a few of the problems connected with the grouping of buildings, the treatment of street junctions and corners, and the development of pictures in straight streets may be of interest, and will serve also, I think, to illustrate the way in which it has been found practicable there, mainly by means of suggestion, with here and there, of course, some necessary insistence, to secure a high degree of co-operation among many architects, all thinking first of the total effect, and of their own individual buildings as forming part of that total.

I want to suggest to you that fine city building which is after all the end and aim of the art of town planning is essentially a co-operative art, and indeed, I believe, the art of architecture itself is very much more a co-operative art than many people seem to think. It is more and more necessary to bring to bear upon even our individual buildings types of skill and ability seldom all united in one man, and our offices are really much in the nature of guilds turning out work which is the result of a high degree of co-operation between the principal and the assistants working with him. In the same manner, fine city building can only result from a high degree of co-operation between all the architects working on the individual buildings. Something may be done on limited areas and on private estates, as at Bedford Park or Hampstead, for example, to produce unity of effect by bringing all the buildings under the controlling influence of the ideas of one man, whose attention is centred on the whole effect rather than on the individual buildings, but these are, after all, makeshift methods. Art is not a thing easily to be controlled, and unity of effect in a whole town can only be expected when the whole of its architects are joined together by some common aim, some common appreciation of the whole effect which is being worked up to. This may seem much to expect from the present chaotic and individualistic condition of the architectural profession; but I cannot help hoping that the opportunities afforded almost for the first time in this country by the Town Planning Act, enabling us to consider as a whole, and to guide and to control the development of our towns along definite and well thought out lines planned with the due consideration for architectural effect, will so stimulate in all of us an enthusiasm for the beauty of the whole, that it will become as natural to think first of the whole, and to see our buildings in the true perspective as parts of a great street picture as it has been natural under the conditions which have held sway in this country for so many years for our attention to be concentrated exclusively on our own work. This is the right, the ideal form of com-

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pulsion, the compulsion exercised upon each one of us by our zeal for some ideal which shall be shared by the whole guild of architects. We should do all that is possible in our own practice, and in the education of those who are coming forward to help us and take our places in due course, to foster this spirit, because it is only by the development of this compulsion from within that we shall be able to justify ourselves in resisting some form of compulsion from without.

Did time allow, I might suggest many other ways in which town planning is a co-operative art; notably, we shall need the help of the engineer, the surveyor, and even of the sociologist and archæologist, if we are to guide the development of our towns into lines which shall at once carry on their best traditions, maintain that unique character which gives to each its individuality, and provide adequately for all the needs of a healthy and wholesome city life. If our type of training is worth anything, it should particularly fit the architect to absorb all that is beautiful and valuable in the past, and deriving from it inspiration, to develop by the exercise of a trained imagination town extensions which shall harmonise alike with past beauty and present needs. I have taken many of my illustrations from foreign towns, because I am anxious that we should learn from many sources, but may I remind you with the last slide, that we have in this country still left unspoilt some of the most beautiful dwelling places to be found anywhere, where the work of man and the beauty of nature is wonderfully harmonised; that we have, indeed, rich tradition upon which to build.

Mr. ELLIS MARSLAND, in opening the discussion at the invitation of the President, Mr. G. E. Bond, said that on such a vast subject as town planning there must always be differences of opinion, for some would advocate one scheme and some another. In his opinion Karlsruhe was one of the finest examples; Vienna was likewise most important, for there the latter-day principles of town planning had been grafted on to what had been done before. In England also architects would have to take towns as they were and develop them on some such lines as were to be seen in Vienna. He differed from what Mr. Unwin had said as to the sense of enclosure being the special characteristic of the mediæval *place*. In his own opinion rather the contrary impression was aimed at by their designers.

Mr. E. C. P. MONSOR thought that everyone present must feel that they had learnt a very great deal from the paper. Mr. Unwin had taken them through a large number of Continental towns as well as showing what had been done at Hampstead and Letchworth. Some people might not agree altogether with the work that was being carried out; but on the whole it was excellent, whether the movement was concerned with the housing of the poor or the middle-classes. It was a grand thing that the people should get the best possible value for their money in health and in hygienic surroundings.

Mr. FREDERICK LITCHFIELD insisted on the all-importance of the financial aspects of the movement. Unless people found the requisite funds no houses could be built for them to live in. Architects should bear in mind that their art was a co-operative one. It was more difficult to bring this truth home to the mind of the profession than it was to overcome many existing obstacles. It would be most advantageous if those architects who disapproved of what had been done would come together and arrange a garden suburb which would be free from all those defects. There was a large scope of usefulness, as it was estimated that three million houses were required. An instance of what could be achieved by co-operation was afforded at the Hampstead Garden Suburb, which had been commenced only two and a half years ago. There was room for a lot more of the same careful planning on the edge of the great cities.

Mr. STEWART put in a word for the claims of the surveyor as helping towards the solution of the town planning problem. Surveyors had always dealt with considerable areas, while architects were more accustomed to confine their attention to individual buildings. Up to the present architects had certainly been more prominent in taking up the subject. It was to be hoped that surveyors would not delay in also turning their attention to it.

Mr. CHESTERTON saw in these schemes of town planning a grave danger of a loss of individuality, since people would get in the way of occupying the sort of houses which they were told to do. Town planning was a matter of personal opinion rather than an exact science.

Mr. RAYMOND UNWIN, in replying to the short discussion, said they could not expect everyone to agree with what they did, for they were little more than beginners. Town planning was the work of both surveyors and architects. The surveyor and engineer were most necessary, but when it was desired to get architectural expression, then the architect should be left in command after being furnished with the necessary practical details. There certainly was a danger which had to be guarded against of a possible loss of individuality. But that was no reason for not attempting the solution of the problems. They would learn to define the limits within which each individual should work. The truth was that the proper meaning of the word variety had been lost, or rather come to be erroneously defined as a lot of different things being put together. Whereas variety was really a certain amount of variation from a fixed type; if that principle was departed from, jumble resulted. The individual architect and the town planning architect had to work together if the best results were to be obtained.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last at the premises in Tufton Street, Westminster, Mr. C. Wontner Smith, Vice-President, in the chair.

The HON. SECRETARY announced that a Life Class, under the direction of Professor E. Constable Alston, would commence on Wednesday, January 5, 1910. He also stated that Mr. Edward S. Prior would open his course of lectures on "European Mediæval Architecture" on January 12, at 6 p.m.

On the motion of the CHAIRMAN a vote of condolence and sympathy was passed to the widow and family of the late Mr. G. Sherrin. The deceased had been a member of the Association for nearly forty years.

Mr. F. C. EDEN read a paper, illustrated by lantern views, entitled "Varallo, Orta, and Varese."

Whether we have seen them or not, he said, we all know something of the big things of Italy, and of the works of her great masters in architecture. Possibly in our less heroic moments the big things are apt to seem hackneyed and the big names to pall, so that it is a relief occasionally to turn our backs upon all the grandeur and to dwell for a while on lesser themes.

I propose, then, to bring before you this evening a series of small and hitherto almost unnoticed buildings, the work of obscure or unknown architects, and will ask you to accompany me to a part of Italy which is not famous for any achievement in great architecture, but where the stones cry to us in the vernacular of a district that lay somewhat apart from the main trend of contemporary thought. Varallo, indeed, speaks but the rude patois of a sequestered valley. By the lake of Orta we may listen to the strain of true lyric grace, while Varese tells its story in unmistakable prose, a little turgid and artificial as befitted the times, but not without interest.

If you draw a line across the map of Italy westwards from the town of Como, twenty miles will bring it to Varese, situate among the low foothills just where the mountains fade away into the great Lombardy plain. Go miles further on, after crossing the lower arm of Lago Maggiore it will pass through the town and lake of Orta, and at a point some sixty miles from its starting-place Varallo is reached, in the deep and wooded valley of the Sesia, a river which rises among the glaciers on the western flanks of Monte Rosa. The connecting-link between these three places is that each possesses a noted sanctuary in its Sacro Monte, or Holy Hill, and it is more particularly of these sanctuaries and the buildings which they comprise of which I propose to speak. Imagine a grassy and undulating slope on a wooded hill, dotted with chapel-like buildings that gleam among the tree trunks, or stand out white against the sky, imparting a character of architectural romance to the whole mountain-side. Provide them with porticoes under which are grated view openings to the interior, vary the plan, size and design as fancy directs, and you have the general appearance of a Sacro Monte.

Let us begin with Sacro Monte of Varallo, that being, so far as I am aware, the first thing of the kind to be attempted. Its inception was due to a Franciscan friar, Bernardino Caimi, of noble Milanese family, who had been appointed Commissary of the Holy Places in Palestine by Sixtus IV. He returned home in the year 1481, and partly in grief at the neglected condition in which he found the sacred sites, partly with the wish to edify those of his countrymen who had not the opportunity of travel, determined to found a New Jerusalem in his native Lombardy, to contain, as its central object of pilgrimage, a replica of the Holy Sepulchre. Careful search among possible sites indicated the hill that overhangs Varallo as the most convenient for his purpose; and the foundation-stone of the Holy Sepulchre Chapel was laid in the year 1491. Caimi

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started with the idea of reproducing the Holy Sepulchre, and probably certain other holy places, as Golgotha and the Grotto of the Nativity. But as the work proceeded the idea developed into commemorating the events of the Sacred Narrative by groups of life-sized figures, so that there are now forty-four chapels upon the Sacro Monte. We call these little buildings chapels for want of a better word, but they are not built or fitted for religious functions of any kind, but solely to shelter these groups of painted imagery which form in conjunction with their frescoed backgrounds tableaux of the Redemption story. Samuel Butler (whose "Alps and Sanctuaries of Piedmont" is one of the most delightful books of Italian travel) conjectures that the original idea of these representations, in which painting and sculpture are combined with the realism of a scene on the stage, may have been suggested to Caimi by the great innovator Leonardo himself, who was in Milan at the time the scheme was projected. But in truth the whole idea was essentially mediæval, akin on one side to the miracle play, and on the other to the groups of coloured figures familiar to us in the altar-pieces of Northern Europe. In the earliest examples the figures are of wood, the latest are of stucco, but those of the best period are of terra-cotta. All are painted—nearly all, alas, repainted!—by the nearest house-painter or professor, which comes to pretty much the same thing, with rouged cheeks and staring eyes. For canopies, hangings, and so forth, real drapery is introduced, and the figures have wigs of hair or dyed flax. There is no shirking realism so far as it may be had.

The first sight of these groups is certainly something of a shock. There is a sense of theatrical convention, of self-defeating realism; of the lifelessness that comes from arrested movement, as of a stage full of paralysed marionettes. This is the first impression. But if we complain of staginess, we must bear in mind that this is an attempt to put a scene upon a stage. It is a perpetual miracle play, a mediæval mystery without words or action. This intention must be recognised, and its resultant conventions accepted before we can judge fairly of the way in which it has been realised. It is both easy and obvious to talk of wax-works and Madame Tussaud. All coloured sculpture, even that of the Greeks, is obnoxious to this form of criticism. But what is really at fault in the majority of the groups is the coarse and tasteless repainting which they have undergone. Nor have time and weather been much kinder than the house-painter, and the scaling, blotching, and blistering of the paint, especially of the flesh tints, and the secular incrustations of dust and dirt, have given some of the figures "a diseased and mangy look," as Butler says, "so that there is not a chapel which does not require some effort of the imagination before the mind's eye can see it as it was left by those who made it." But, after all, the strongest motive for suspending judgment and looking a little below the surface is the respect due to the great artists who took part in these works, viz. the three brothers D'Enrico, of Alagna, the great Fleming Tabacchetti, and Gaudenzio Ferrari himself; the last of whom "ranks as among the few purest and most accomplished artists of the very culminating period of Italian art; so that what he thought good enough to do may be worth our while to consider with the best attention we can give to it." Such at least is the opinion of the eminently sane critic I have just quoted. However, it is not my intention to discuss sculptures, and I have only said so much because it was impossible to speak of the chapels without alluding to that for which they exist. At Varese and Orta we may leave the contents of the buildings out of count altogether, but at Varallo there are both frescoes and sculptures which undoubtedly take a high place among the works even of that great period, the Cinquecento.

The Sacro Monte rises precipitously to a height of about 500 ft. above the little ones, and is approached by a paved and well-graded path overshadowed by the chesnuts with which the flank of the hill is covered. When the top is reached the first impression is a bewildering one, as of an inconsequent and haphazard jumble of chapels. But even when many hands and many minds have laboured on a piece of work, and at long intervals of time, that is not the Italian way. As a matter of fact, buildings went on at irregular intervals during a period of two centuries and more. Over forty chapels had to be huddled on to a small, irregular, and *accidenté* piece of ground; they had to be approached in a certain order, and no architect of repute, except the rather second-rate Alessi and Tibaldi, were employed.

When the sanctuary was first projected it was doubtless impossible to foresee to what an extent the scheme would develop. So it came about that as new chapels were founded from time to time they were built on convenient spots, with due regard to æsthetic requirements, but without much consideration for the chronological sequence of the events commemorated. Towards the close of the sixteenth century Tibaldi was commissioned to prepare a plan to remedy this confusion, and though little or nothing in the way of building can be attributed to him, the arrangement of the connecting path by which the chapels are linked in their proper order seems to have been his. The sinuosities of the path are far more judicious than the serpentine meanders of the Jardin Anglais, and there is much of the characteristic charm of the Italian garden in the lay-out, in which we include the length of time required to find out how small the area of ground covered really is. The path, of course, is cobble-paved with cross ribs of granite to afford foothold where the gradient is steep. It is bordered with trim hedges of box and beech; clipped shrubs and stone seats are set in the right places, and the chapels themselves supply points of interest at every turn of the way. The walls are plastered, the columns and dressings of grey granite, a combination equally charming and appropriate whether among the bleak Breton moorlands or on the wooded slopes of these riant Alpine valleys. Much, of course, will depend upon the texture of the plaster, and we may trust the Italian even now to get an interesting surface in that material. The fine stone slabs with which the roofs are covered would suffice to confer a sort of dignity upon the meanest shed. Owing to the absence of coursing they have a curious appearance of having been thrown helter skelter on to the roof, and though doubtless they lie closer than they seem to do, and there must be no little method in the madness of their laying, it is not easy to see how they manage to exclude the searching snows of winter. In beauty of colour and texture these roofs excel, if that were possible, the stone roofs of the Cotswolds, and to one looking down from the Sacro Monte upon the huddled houses of Varallo, the little town seems clothed in mouse-coloured velvet, with an occasional patch of tiling to give the effect of rose-coloured rivers.

In the erection of the chapels two systems of planning have been followed. The earlier were built upon a simple quadrilateral plan, divided by a screen into two compartments, the inner for the sculpture, and the outer for the accommodation of the pilgrims. In the later examples the entire space is given to the representation, and an external portico is attached to shelter the spectators, with grilled openings to the interior. The screen is often the most interesting part of the building. The upper part is usually glazed with nice old glass of pleasant tint and texture. Below is an oblong grille of carved wood, the upper part sometimes canted to afford a comfortable view of the wall and ceiling paintings. These wooden lattices are a peculiar feature of Varallo, as the iron grilles are of Orta.

The highest point is a rounded knoll, the summit of which is occupied by the chapel of the Transfiguration. This is a huge plain drum 40 feet in diameter and of considerable height; in itself bald and unsatisfying. But charming contrast is afforded by the porch with its delicate coupled columns and interesting entablature; and it should be borne in mind that these chapels are not so much isolated objects as parts of a composition. The architects of the seventeenth century at their worst were usually good scene-painters, who thoroughly grasped the art of grouping and of producing striking effects. It was probably their feeling for scenic propriety which led them to adopt the circular or polygonal plan whenever they had to build a chapel on an eminence. Orta and Varese supply numerous examples of this preference.

The concluding chapels of the series are grouped together near the edge of the precipice overlooking the town, so as to form a sort of piazza. One side is occupied by the large church of the Assumption, and the other three by a picturesque medley of chapels, cloisters, and loggias. The church has an intolerable modern façade, gaudy and pompous; in most unpleasing contrast to the quiet beauty of the rest. Three large chapels, containing respectively the Nailing to the Cross, the Crucifixion, and the Deposition, form an important group in the south-east corner. They are raised partly on a lofty substructure, partly on the native rock. A loggia extends along the front, approached by a flight of steps at either end. The first and last contain notable works by G. d'Enrico. In the Crucifixion chapel both sculpture and paintings are by Ferrari. "No finer works of their kind have been preserved to us," says Butler. Be this as it may, no one who knows Saronno, or has even glanced into the Church of St. Maria delle Grazie at the foot of the hill, will doubt that he is in the presence of a really magistral work—devout, manly, and dignified. As you turn from this you are faced by the light colonnades

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of the Scala Sancta, an imitation for pilgrimage purposes of the Roman original, by which we may ascend to the upper cloister to enjoy another view over the piazza, and a wonderful outlook through the clairvoyées at the back up the valley of the Lesia, with Monte Rosa's snowy summit closing the distance.

Taken as a whole, the chapels of Varallo must be pronounced inferior in delicacy and refinement to the best of those at Orta, and in grandeur and scenic picturesqueness to those at Varese; but in simplicity, variety, and skilful grouping they are hard to beat. Moreover, and this is perhaps their greatest merit, they are entirely suited to their situation and use. The gentlemanly elegance of Orta and the pomposity of Varese would alike have been out of place amid these sunny Alpine pastures, where such beauty alone need be sought as comes from that harmonious blending with nature which ever rewards the unaffected use of those materials which come readiest to hand.

(To be concluded.)

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

AT a meeting of the Society on Thursday evening, December 9, Mr. Butler Wilson, F.R.I.B.A., delivered a lecture on "Cuthbert Brodrick," the architect of the Leeds Town Hall.

In a comprehensive survey the lecturer touched upon the salient features of a remarkable career. Born at Kingston-upon-Hull in 1822, Brodrick was in 1837 articled with Mr. Lockwood, architect, of that town. On the expiration of his articles he visited the Continent for purposes of architectural study and spent much time in Italy, whence he derived inspiration for his subsequent work.

It was at Rome in 1844 that he first met the late Mr. H. B. Garling, F.R.I.B.A., who was, it appears, an intimate friend of Brodrick. Upon his return from his "grand tour" in 1845 he commenced practising on his own account, and in 1852 obtained the commission for the Philosophical and Literary Society's buildings in Hull, this being his first important work. In 1853 he was instructed to proceed with the plans for the town hall to be erected in Leeds, his design having been placed first by the assessor, Sir Chas. Barry, in a competition in which he defeated his late master, Lockwood. This building, although one of his earliest works, reflects perhaps more of his genius in its bold handling of the Grand Classic manner than any other, and it is noteworthy in that it has provided the "motif" for at least three other town halls—those of Bolton, Morley and Portsmouth. Other examples of his work are the Leeds Corn Exchange and Institute—the latter, a monumental treatment of a small front; Hull Town Hall, the Wells House on the Ilkley Moors, and the Scarborough Grand Hotel.

With Barry, Street, Owen Jones, Penrose, Cockerell, and others, Brodrick was invited to submit designs in the ill-starred National Gallery Competition, while his design for a new Custom House at Bombay, to involve an outlay of 270,000*l*., was placed first, a distinction for which he received 3,000*l*. from Lord Palmerston's Government as the project was never realised.

Elected a Fellow of the R.I.B.A. in 1870, he became a member of the Council of that body in 1874.

His active practice seems to have but covered some sixteen years—1852-68—a large portion of his time after the latter date being spent in Paris, where he experienced the rigours of the siege. Later he lived in quiet retirement at Neuilly, and his closing years were spent at "La Collene," Jersey, where he died in 1905.

As with many another great name, Brodrick's had been exampled as that of a failure, even to his having died in poverty; on the contrary, always in comfortable circumstances, he died in his eighty-third year, leaving the not inconsiderable fortune of 11,000*l*.

In conclusion, Mr. Wilson acknowledged his indebtedness to those who had supplied him with much valuable material in the form of sketch books, drawings, and facts bearing upon Brodrick's life and work.

The lecture was admirably illustrated by a series of eighty lantern slides and a unique collection of original drawings by Brodrick, many of which were exhibited for the first time.

A cordial vote of thanks, on the motion of Mr. Marshall, seconded by Mr. H. S. Chorley, F.R.I.B.A., was accorded to Mr. Wilson.

The next general meeting of the Society will be held on Thursday, January 13, when Professor S. D. Adshead, of Liverpool University, will read a paper on "Town Planning."

COBHAM, KENT.*

FOR more than six hundred years the lords of the manor of Cobham have resided upon the site of Cobham Hall. When John de Cobham died in March 1300 his manor house at Cobham was described as a messuage with garden worth 6*s*. 8*d*. per annum. The lands comprised 585 acres and no less than eighty-five free tenants in gavelkind as portions of the Cobham manor, paying to the lord assized rents amounting to 10*l*. 10*s*. 4*d*. in money, seventy-six head of poultry, 170 eggs, and one and a half coulter annually.

In the year 1327 all the goods and chattels belonging to the first Lord Cobham in this manor house and parish were valued at 16*l*., and the subsidy paid upon them was 1*l*. 11*s*. 11*d*. There are no records whatever respecting the size or style of the building which then formed the manor house. The existing mansion, built of red brick with stone dressings, is the work of three distinct periods; the north and south wings were built by the two last Barons of Cobham between the years 1584 and 1603; the main portion of the central building was erected by Inigo Jones for James Stuart, Duke of Lennox; the third and fourth Earls of Darnley added an eastern face and some bedrooms to that central building, and erected or rebuilt much of the kitchen square, stables, coach-house, and corridor. According to the custom of the period, in building such a house the Lord Cobham especially designed one fine room in a commanding position for the occupation of the queen when she should deign to visit him, and it was and still is called "Queen Elizabeth's room," although she never entered it. Approaching the Hall from the north one is struck with the stately appearance of the two Elizabethan wings of the building; they are of red brick pierced with large rect-



COBHAM HALL, KENT.

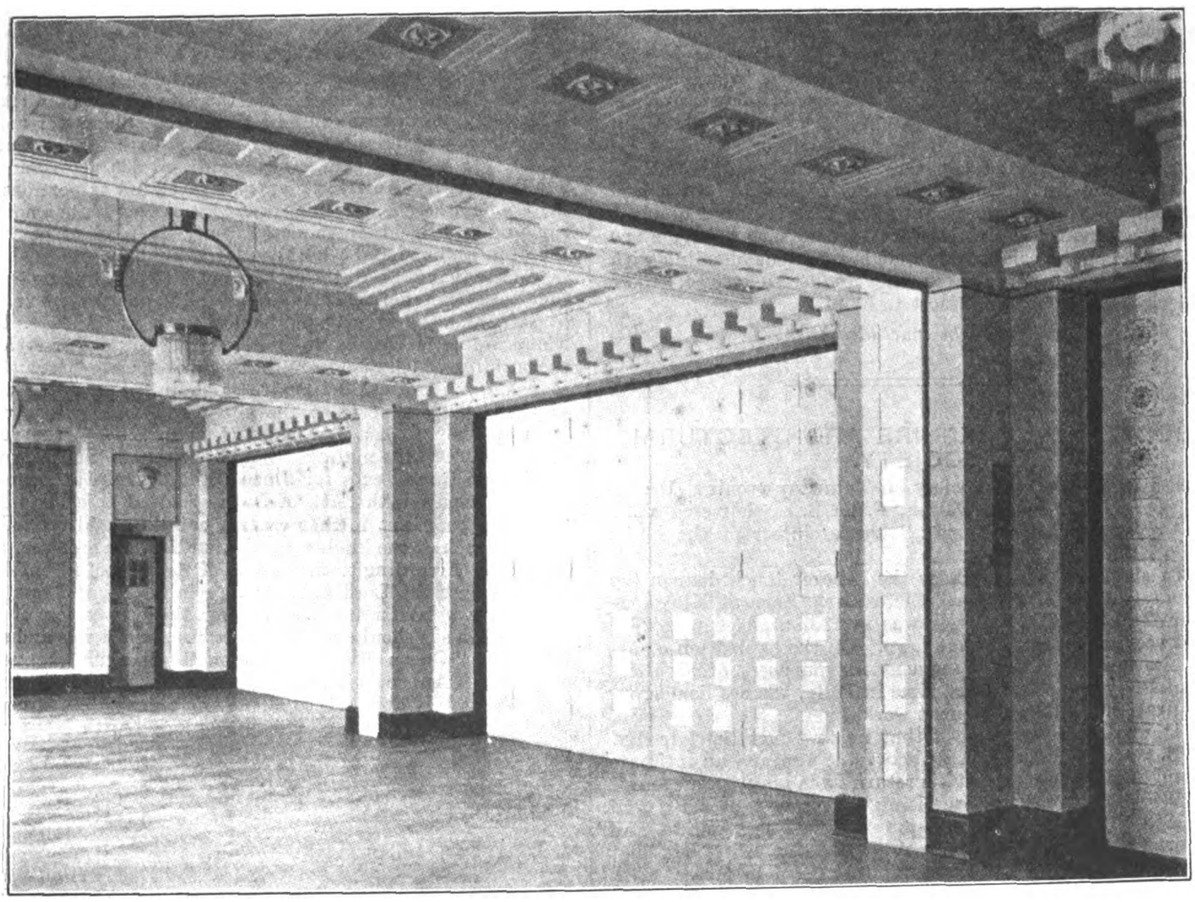
angular windows framed in stone and flanked on the east and west by octagonal turrets. The grand entrance is in the middle of a covered corridor. Entering through the doorway we pass beneath the arms of Queen Elizabeth, and passing up the hall see on our left a huge sarcophagus of red granite, 10 feet long and six tons in weight, originally formed for a bath. Ascending the grand staircase, on the right is the picture gallery, 133 feet long and 24 feet wide; upon the walls hang the gems of the Cobham collection of pictures. Among the great artists are Rubens, Titian, Holbein, Velasquez, Guido, Vecchio, P. Veronese, Tintoretto, Vandyke, and many others. Over the vestibule and library are State bedrooms, which were occupied by the Princess Victoria and the Duchess of Kent when they visited Cobham. From the vestibule we enter the elaborately gilded music-room or hall, 32 feet in height, 50 feet long, and 36 feet broad. The walls are completely lined with veined white marble, the upper portion is decorated with elegant designs and brilliant with gilding; at the north end over the doorway is an organ gallery supported by marble columns. It is interesting to notice the resemblance between this noble hall and the still more stately pile erected at Hatfield by Robert Cecil, Earl of Salisbury. William Brooke, Lord Cobham, was his father-in-law, and it cannot be doubted that Cecil gathered many ideas for the plan and details of Hatfield House from what he saw at Cobham Hall.

The dining-room, which is 50 feet long and 24 feet wide, contains a handsome marble mantlepiece of the Elizabethan

* Read by Mr. R. M. Bromley at a meeting of the Upper Norwood Athenæum.

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MODERN EUROPEAN ARCHITECTURE.
GERMANY.



[From *Moderne Bauformen.*

CORRIDOR TREATMENT IN THE ARTISTS' CLUB, DRESDEN.—Rudolf Bitzan, Architect

age reaching to the ceiling, some fine portraits framed as panels on each side of the fireplace, and many others adorn the walls—one of Mary Queen of Scots with the scene of her execution in the background. The library, which was formerly the chapel, contains an elegantly designed mantlepiece of yellow marble reaching nearly to the ceiling; the shields emblazoned in the window of this room are those of the fourth Earl Darnley.

The village of Cobham is situated on the top of one of the downs of the chalk formation which characterises the district. It probably derives its name from this feature, as the prefix "cob" signifies "head" or "top," and is an analogue to the German "Kopfheim." The church is large and dedicated to St. Mary Magdalene, and consists of nave with aisles, a spacious chancel, and an embattled tower at the west end; the oldest portion of the structure is the chancel of Early English architecture, finely proportioned, and belonging to the first part of the thirteenth century, and lighted by five lancet windows on each side. The church is distinguished above all others as possessing the finest and most complete series of brasses in the kingdom; it contains some of the earliest and some of the latest, as well as some of the most beautiful in design. There is an interest also in the fact that for the most part they refer to one great family; the latest memorial is an altar-tomb of great beauty near the altar; there are also some brasses to the memory of the Masters of the college. The family of Cobham, which took its name from the village, first comes into notice in the twelfth century, when one Cerlo de Cobham was possessed of property in the parish of Cobham. His son Henry purchased the manor of Cobham, with the marshes of Bulham and Swanford, from William de Quatermere in 1208; it is supposed he was one of the Crusaders present at the siege of Acre in 1191. He held the office of Lieutenant of Dover Castle, and died in 1225. History reveals the fact that the lords of Cobham rendered an unbroken succession of services to the State at the most critical periods of English history, and that John de Cobham, the "founder," must be placed among the most eminent statesmen of his time. He died on January 10, 1407. On the south side are three sedilia and a piscina of great beauty of design which belong to the second half of the fourteenth century; in the chancel hang two fine specimens of tilting helmets of Sir Reginald Baybrooke and Sir Nicholas Hawberk.

William Brooke, Lord Cobham, was the eldest son of George Brooke, Lord Cobham, and he had erected the magnificent tomb in Cobham Church to the memory of his parents; he emblazoned nine of the eleven armorial quarterings to which his mother was entitled—she died in September 1559—and he celebrated her praises in some Latin verses which have been translated by Mr. Reginald Cust, the husband of Lord Darnley's sister, Lady Elizabeth:—

Sprung from the Brays, to Cobham's lord allied,
Worthy to bear two names of ancient pride,
Here Anna lies, a lady chaste and fair,
Blest with her children's love and husband's care.
Large her estate, but of ample store,
Large was the share allotted to the poor.
'Twas in the last sad year of Mary's reign
That first the husband, then the wife was ta'en.
In life united each to each did turn,
In death they share the same sepulchral urn.

NOTES ON BOOKS.

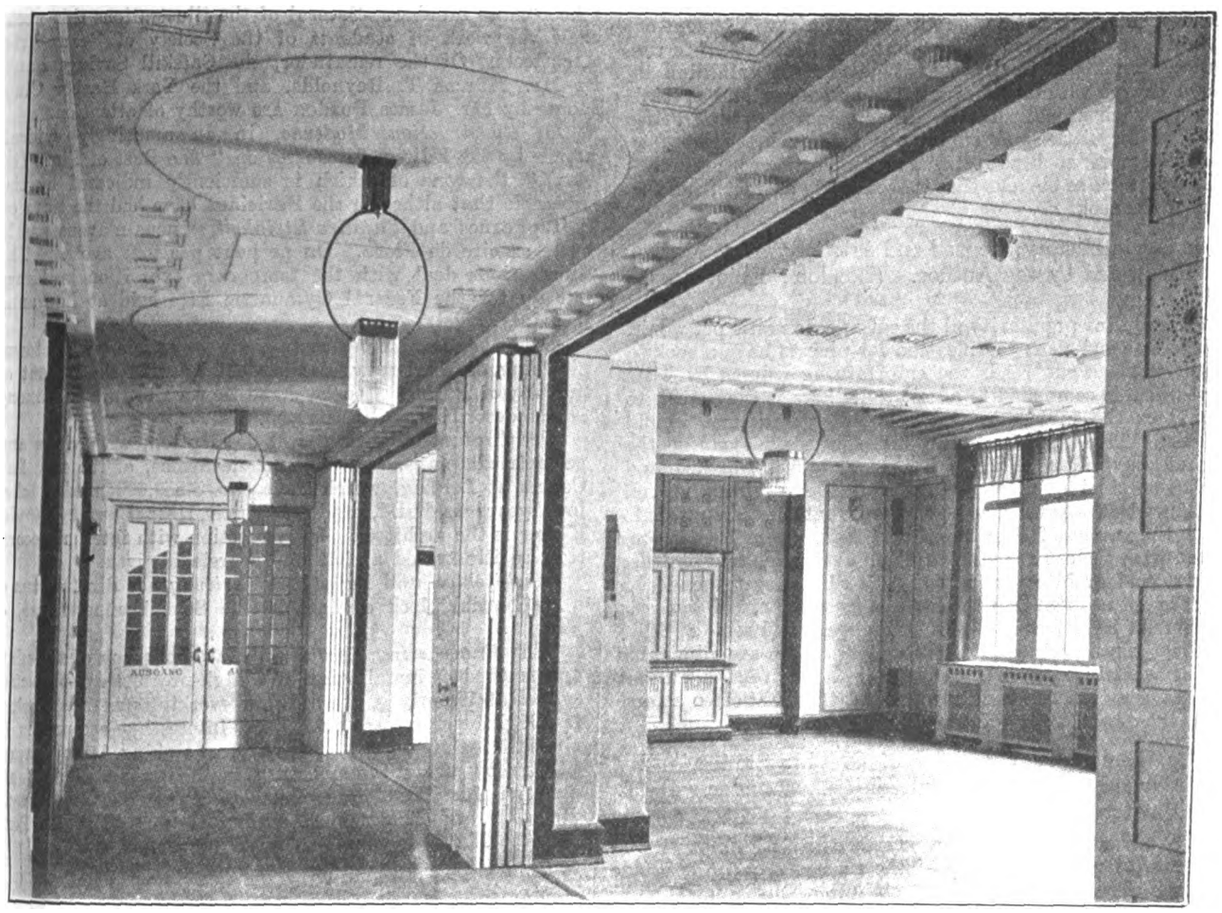
"The Cathedrals and Churches of Belgium." By T. Francis Bumpus. (London: T. Werner Laurie. 6*s.* net.)

PROXIMITY to England, readiness of access, the small size of the country and the number of important towns and cities at no great distance apart, the excellent railway system, and above all the number of pictures by noted masters to be found in the churches, have combined to make Belgium a

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MODERN EUROPEAN ARCHITECTURE.

GERMANY.



[From *Moderne Bauformen.*

CORRIDOR TREATMENT IN THE ARTISTS' CLUB, DRESDEN.—RUDOLF BITZAN, Architect.

favourite ground for the British tourist. Hence there is value in a book which, without being too technical, is instructive to the layman, and points out what is the position of the ecclesiastical architecture of Belgium in the domain of art, what are the peculiar characteristics of its cathedrals and churches, how they have come to take the particular form and treatment that is theirs.

But while the lessons that Mr. Bumpus teaches in an easy and, so to say, conversational manner that makes his writing pleasant reading to the least instructed in the technicalities of architecture, are invaluable to this class of reader, the professional student will find guidance and direction of a no less useful character, particularly should he be wishing to specialise his studies in some one by-path of ecclesiastical art.

We may not perhaps be always ready to agree with the views that Mr. Bumpus expresses, as, for example, that vaulting with bare red brick is a more "true mode of decoration than if covered with plaster and polychromatic painting or that glass-painting, *peinture en apprêt*, is an improvement on glass-staining and leading or mosaic method of earlier times."

The scheme of the book is good. First a historical sketch of the political life and architectural development of the country, then a chapter on the furniture and decoration of Belgian churches, followed by a description and criticism of the cathedrals and churches of some of the most important towns and cities of Belgium—Tournai, Courtrai, Ypres, Bruges, Ghent, Malines, Brussels, Antwerp, Louvain, Aerschot, Liège, Oudenarde, Huy, Lierre.

Throughout the book, which is well illustrated, Mr. Bumpus continually diverges to bring into comparison other churches than that he is at the moment describing. This, a valuable feature, particularly makes us lament the want of an index, the only fault we have to find, and which we regret the more as it would add to the character of an eminently readable and instructive book that of a most valuable work of reference.

"The Architect's Directory and Specification Index for 1909." (New York: William T. Comstock. $3 net.)

A complete list of the architects of the United States, Canada, Cuba, and Porto Rico, and of the landscape and naval architects of the United States and Canada, cannot fail to be of value to many of our readers, and the ninth edition of Comstock's Directory claims to contain this, besides particulars of the architectural societies and organisations of the world, architectural schools in the United States, building departments and architects to Boards of Education in the principal cities of the United States and Canada. We are somewhat surprised to learn that there are no more than 6,523 firms of architects in the United States and 779 in the Dominion of Canada, although we are aware that in the States large offices with an army of assistants are far more general than with us.

"Valuation of Real Property: a Guide to the Principles of Valuation of Land and Buildings, &c., for various purposes." By Clarence A. Webb, P.A.S.I. (London: Crosby Lockwood & Son. 7*s.* 6*d.* net.)

Although no one can learn to be a valuer by merely reading a book, the young surveyor who aspires to be an expert valuer can learn from a good book much of the principles and methods of valuation, by a knowledge of which he will be the better fitted to appreciate the lessons that experience alone can teach. The work which Mr. Webb has produced will be most valuable to the young surveyor, and explains very clearly and fully the general principles and practice of valuation. First, the nature of freeholds, leaseholds, life interests and sinking funds are explained, and their valuation elucidated. Then the valuation of land and buildings separately, in connection with which are some useful and reliable figures of the cost per foot cube of various classes of buildings. Valuation for mortgage is a branch which young

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architects and surveyors are very likely to find come in the way of their early practice, and the pitfalls that await the inexpert valuer are well and forcibly pointed out. Other sections of the practice of valuation with which the author deals are timber, arbitration, compensation for compulsory purchase, rating, taxation, death duties, enfranchisement of copyholds, compensation under Licensing Act. 1904, fire insurance. Thus practically the whole field of valuation is covered except valuations of special businesses and special property, such as old masters, departments in which principles go for little and experience for much. Some few printer's errors, such as mortgagor for mortgagee, need correcting, but are so obvious that they scarcely detract from the value of the book.

"The Cat in History, Legend and Art." By Anne Marks. Illustrated by the Author. (London: Elliot Stock. 6*s*. net.)

The peculiar popularity of the cat as a domestic pet would seem to be a sufficient justification for puss to have a book to herself, and as one reads the entertaining volume by Miss Marks, one is compelled to admit that there is very much to be said on the subject in regard equally to history, legend and art. The important part filled by cats amongst the ancient Egyptians as an object of religious worship and symbol of vital principles or attributes of divinity is well explained by the author, who also points out the disrepute into which the animals fell in the Middle Ages. The legends connected with the cat are many and interesting as told by Miss Marks, and architecture is not omitted amongst them. In art it is but natural that the cat as a general part of domestic life should have frequently been depicted, and some of Miss Marks's own drawings of incidents in cat life are admirable and completely depict feline character and expression without the exaggeration and tendency to caricature that often accompany the presentations of other artists.

"The Elementary Principles of Graphic Statics." By Edward Hardy. Second edition. (London: B. T. Batsford. 3*s*. net.)

The second edition of Mr. Hardy's little book, with the addition of matter treating of the reactions of walls under oblique thrusts, B.M. under oblique thrusts, and wind pressure on pitched roofs, further enhances the value of about the simplest and most concise introductory manual to the study of graphic statics that we have. Commencing with an explanation of the possibility of carrying out the simplest rules of arithmetic by graphic methods, not as a piece of pedantry, but as a good introductory exercise, the book gradually leads the student on through the fundamental doctrines of the triangle and parallelogram of forces to the consideration of funicular polygons and so on to the calculation of bending moments and stresses in framed structures, carrying these as far as those simpler forms of roofs to which reciprocal diagrams are applicable without resort to the aid of the method of sections.

"In English Homes. The Internal Character, Furniture and Adornments of some of the most Notable Houses of England, accurately depicted from Photographs specially taken by Charles Latham." The Letterpress edited and an Introduction written by H. Avray Tipping, M.A., F.S.A. Vol. III. (London: *Country Life* and George Newnes, Ltd. 42*s*. net.)

The most attractive feature of "Country Life" to most architects has been, and is, the remarkable series of illustrations of the old mansions of England, and therefore no doubt many will be glad to have in separate form the volumes in which the illustrations and descriptions of these houses are gathered. The present volume, as we are told in the introduction, deals especially with English homes of the period from and including Inigo Jones to Sir William Chambers, and is thus intended to show us "how English Palladianism arose and developed, what men introduced and practised it, where the most typical examples of the style in its varying aspects are to be found."

The uniform excellence of representation and care in selection of salient features that has characterised the original articles in "Country Life" is therefore here maintained. The introduction by Mr. Tipping is a clear and careful explanatory thesis on the subject of English Palladianism, its rise and culmination. It is needless to say that the large scale and clearness of the photographs renders the volume as valuable to the professional student as any book without geometrical drawings can be, whilst it is at the same time attractive and sufficing for the amateur.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* has a continuation of the article on "Consideration in School-house Design," by Professor A. D. F. Hamlin, which was commenced in the special school-house number. Several of the illustrations this week show the work of students of the Society of Beaux-Arts Architects. Of the remainder, the Catskill Savings Bank by Mr. Marcus T. Reynolds, and the York Harbor Club House by Mr. James Purdon are worthy of attention.

La Construction Moderne, in an amusingly cynical article by the Editor, discourses on "The Bust of Flora (in wax)," the tone of which is sufficiently indicated by the preamble that although the Parisians have had the tiara of Saitapharnes and *l'affaire Steinheil*, "nous n'avons pas le buste en cire de Flora. On ne peut pas tout avoir." The illustrations deal with the temporary exhibition buildings put up for the Federal Gymnastic Fête held at Lausanne last July.

Deutsche Bauzeitung commences an article on the town-planning of Karlsruhe, dealing chiefly with the lay-out of the Haydn Platz. Modern domestic architecture in Saxony is also described and illustrated.

Der Profanbau gives a full description, with views and geometrical plans, sections and elevations, of the new Law Courts at Leipzig, which have cost 3,230,000 marks, taken four years to build, and of which Herr Baurat Theodor Kösser is the architect. In connection with internal decoration an illustrated article on Intarsia is given.

Architekten und Baumeister Zeitung has illustrations of a residential block of flats in the Schönbrunnerstrasse, of Vienna.

The *Engineering Record* gives a description of the plant and method of installation of a high-pressure fire-protection system at Winnipeg, the ordinary working pressure of which is 300 lb. per square inch. An interesting account is included of the method adopted for sinking large concrete pillars by the "Compressol" method in a difficult soft stratum for the foundations of a power-house for the Roessler and Hasslacher Chemical Company at Perth Amboy, N.J.

GENERAL.

Mr. George Campbell Sherrin, F.R.I.B.A., who died last week, was well known to a large number of London architects, and combined the *rôles* of both a metropolitan and provincial architect of very extended practice. To enumerate all his many works would be difficult, for we remember hearing him say that at one time he had more than sixty in hand at once. Amongst the more important of Mr. Sherrin's works were Spitalfields Market; St. Mary's Church, Moorfields; Woburn College, Weybridge; the dome of Brompton Oratory; and several station buildings for the Metropolitan Railway Company.

Mr. T. W. Cutler, F.R.I.B.A., whose death was also announced at the last Institute meeting, was well known for the character of his domestic work, hospitals and hotels, and greatly esteemed for his genial personality.

Mr. John Lanham Hollis, J.P., of 18 Trinity Place, Windsor, builder and contractor, of the firm of Hollis & Sons, left estate valued at 18,126*l*.

Mr. James E. Saunders, J.P., of Lee and 4 Coleman Street, E.C., architect and surveyor, left estate of the gross value of 8,983*l*.

Mr. F. A. Clark, architect, Plymouth, has prepared plans for County Territorial Association headquarters in Plymouth estimated to cost about 3,500*l*. The building will be of two storeys and with a length of 120 feet. The plans have just been officially adopted.

The Financial Board of Cambridge University have issued a report on the endowment fund and on the cost of maintenance of the new buildings. The board are disposed to think that before any further buildings are sanctioned provision should be made for their maintenance by the investment of a capital sum proportionate to their cost. They think this sum should cover the cost of rates and taxes, external repairs and insurance, and they estimate that these would amount annually to something over 1 per cent. on the capital outlay. If so the minimum to be invested to provide for these charges would be more than one-quarter of the cost of erection.

The Will of Mr. Henry Cooper, architect, of Waterloo Place, King's Road, Reading, has just been proved at the amount of 8,510*l*. 4*s*. 8*d*. net.

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The Architect.

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FORTHCOMING EVENTS.

Tuesday, December 28.

Royal Institution: First Juvenile Lecture by Mr. W. Duddell on "Modern Electricity (1), First Principles."

Thursday, December 30.

Royal Institution: Second Juvenile Lecture by Mr. W. Duddell on "Modern Electricity (2), Electrical Instruments."

Saturday, January 1, 1910.

Royal Institution: Third Juvenile Lecture by Mr. W. Duddell on "Modern Electricity (3), Rontgen Rays."

Wednesday, January 5.

Architectural Association: A Life Class opens under the direction of Professor E. Constable Alston.

Monday, January 10.

Liverpool Architectural Society: Paper on "Some Lessons from America," by Professor C. H. Reilly, M.A., A.R.I.B.A.

ROOD-SCREENS AND ROOD-LOFTS.

OF all the accessories that went to make up the completely furnished mediæval church there is scarcely one which occupied a more conspicuous position than that of the rood-screen, whether with or without the rood-loft as its accompaniment. By reason of this conspicuous position as well as of the ritual and symbolic importance of the screens, they naturally became the object of the bestowal of some of the best skill of the craftsmen, and of the loving devotion of the artists who worked to make the church at once the great repository of the beautiful and the centre of sanctity to the parishioner of the Middle Ages. Though much has vanished from the churches of England of the exquisite screen-work of former times, by decay and neglect, by mistaken religious zeal, and by unappreciative "restoration," the two thousand and more examples of screen-work that remain in England and Wales furnish opportunity for yet another handsome, interesting, and instructive book upon the subject.*

The magnitude of the theme, as well as their own personal experience, has probably led the authors to present a rather one-sided view of the screen-work of England and Wales, for the two volumes give an altogether undue prominence to the work of the West Country to constitute the book a conspectus of the rood-screens and rood-lofts of English workmanship, and the amateur of ecclesiastical art who might expect to learn what English screen-work means might easily overlook the slight acknowledgment that the authors make of the merits and importance of other localities. It is true that East Anglia is mentioned as one of the three districts pre-eminent for the possession of choice wooden screen-work, and placed first, we will admit, before the South-West and the Welsh Border, and if the reader will refer to the excellent comprehensive list and note the number of examples to be found in the Eastern Counties, he may perhaps draw the conclusion that as regards number of examples, East Anglia is justly included amongst the notable districts. Both authors admit the superiority of the painted decoration to be found in the East, for we are told that "whereas those of Norfolk are refined works of art, frequently of a masterly character, their effect heightened with gold and with the relief of embossed designs, those of Devon are mostly of rude and conventional design, coarse in execution, yet picturesque in their ugliness, and very valuable in their antiquarian merits and their symbolic interest." Again, it is said, "As regards the artistic value of the paintings in Devon it must be admitted that, as a rule, they fall far below the standard of the East Anglian screens. There is none of that exquisite diaper-work, those backgrounds powdered with flowers and arabesques, those intricate and elaborate patterns in raised gesso-work, blazing with burnished gold, that we find in such wonderful profusion on screens like those of Ranworth, Cawston, and Barton Turf. Nor are the figures of the Saints so well drawn as a rule, or so richly vested in robes of elaborate brocade."

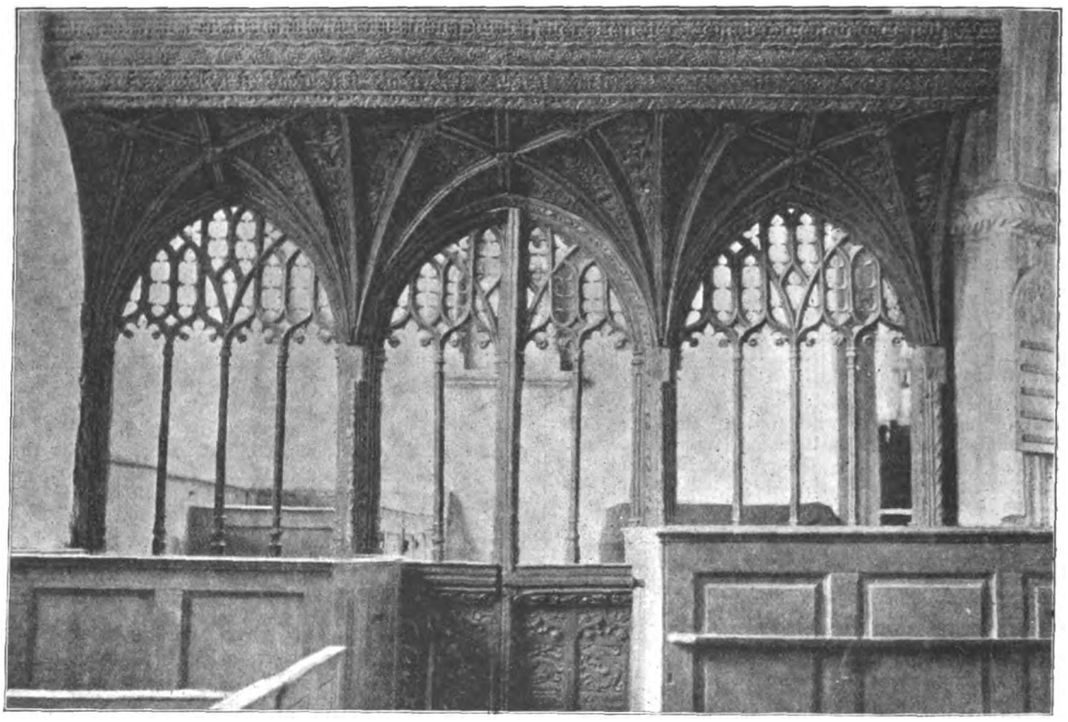
The book which Mr. BLIGH BOND and Dom BEDE CAMM have produced consists of two distinct parts, a the historical essay, and even intimates that his colleague down to the Post-Reformation period, and a description of all the remaining examples in Somerset, Devon, and Cornwall, particularly full as regards those of Devon. Whilst we acknowledge with gratitude the thoroughness with which the authors have dealt with the screens of the South-West Country, we feel it necessary to point out that the comparative neglect of those of East Anglia prevents their work from taking rank as a complete account of the rood-screens and rood-lofts of England.

Mr. BLIGH BOND accepts the sole responsibility for the historical essay and even intimates that his colleague and he are not in accord on all points as to the views therein expressed of the origin of screen-work. Mr. BLIGH BOND's theory is briefly that the use of screens grew up along two concurrent lines of development, exhibited in the two types of church plan from which was evolved the final form of the mediæval church in England, the Romanesque basilican type and the Celtic square-ended type, which latter the author suggests came direct from the East, and possibly through the medium of Phœnician traders. Both lines of development are presumed to start from the early practice of consecrating the elements in the Eucharistic service by a celebrant hidden and separated from the laity by a veil or veils, a point of ritual adopted by the early Christian Church from Jewish custom. The rite of veiled consecration fell into disuse between the seventh and twelfth centuries, and the veil disappeared save for its employment during the season of Lent. Hence as a division was still required between the laity in the nave and the clergy in the sanctuary, screens took the place of the veil.

Mr. BLIGH BOND traces the line of development in the basilican church plan as showing the use of, first, veils only, then of rails or barriers in addition, next of *cancelli* or lattice-work enclosure combined with veils, and afterwards themselves forming the division between laity and clergy, and so developing into screens. From the basilican church plan Mr. BLIGH BOND also derives the

* *Rood-Screens and Rood-Lofts.* By Frederick Bligh Bond, F.R.I.B.A., Hon. Diocesan Architect for Bath and Wells, and the Rev. Dom Bede Camm, O.S.B. In two volumes. (London: Sir Isaac Pitman & Sons, Ltd. 32*s.* net.)

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SCREEN AT MARWOOD, N. DEVON. [From "Rood-Screens and Rood-Lofts."

use of a triple arcade as the structural division between nave and chancel from basilican churches such as Rochester, Reculvers, Brixworth, and St. Pancras at Canterbury. His sequence of development is, however, broken by his admission that "from the seventh down to the twelfth century any authentic specimen of the triple choir-arcade is hard to discover." He admits also that in other churches of basilican type the triple arcade did not exist. We should rather lean to the opinion that the existence of this feature in Romano-British or Romanesque basilican churches and in thirteenth-century work does not involve any causal connection, but is a coincidence based on similar conditions of symbolism and convenience.

Our author's theory of the development of the triple arcaded choir division from the Celtic type of plan appears to us to have a greater element of plausibility. Chancel arches of such small dimensions as the 3-feet width at Bradford-on-Avon and the 4 feet 3 inches at Upton, Bucks, were clearly admirably suited to the mystic rite of veiled consecration, and when this was dropped nothing would be more natural than to pierce the walls at the side of the narrow arch with hagioscopes, of which our author gives us several examples. Such an arrangement would also be convenient for the provision of Jesus altars, especially in small or aisle-less churches. The gradual enlargement of the hagioscopes either to an arch equal to the central and original one, as at Capel-le-Ferne and Bottisham, or to an arrangement of small traceried openings as at Winterbourne Monckton and Curdworth, would readily be followed by the lightening of the original wall above as at Sandridge, and then of its omission as at Highway, and so we have a division between laity and clergy which is purely a screen and nothing more.

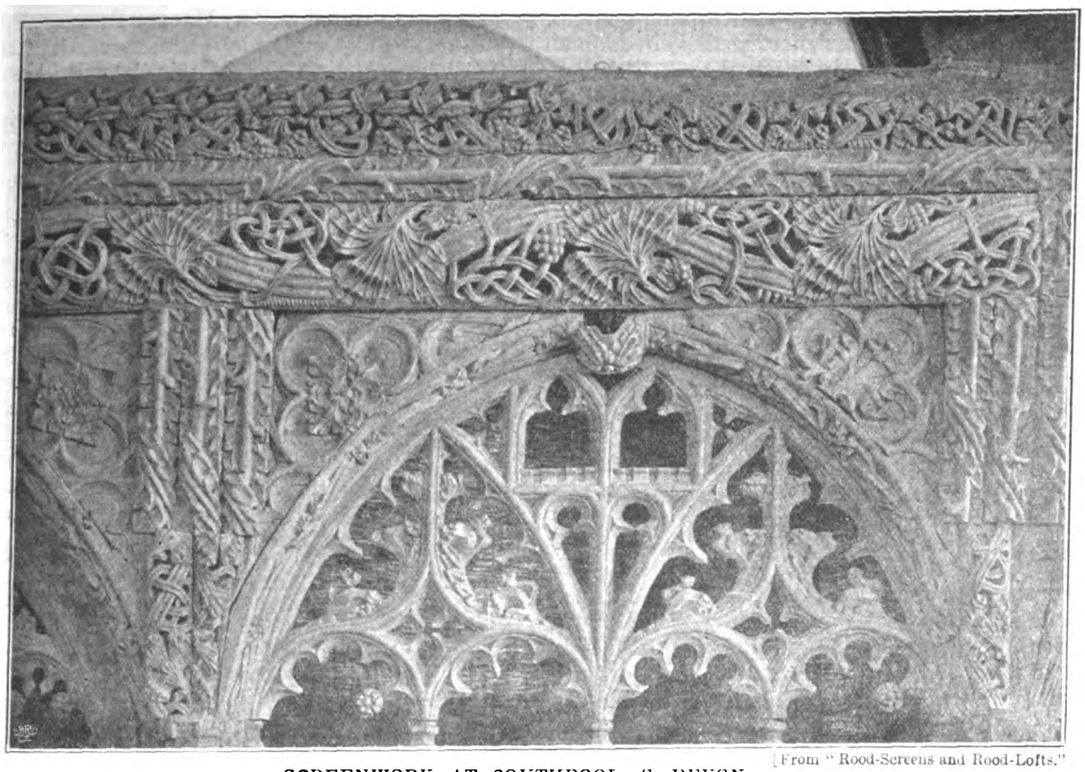
Whilst we may recognise this as a plausible theory, it must be remembered that as far as we know the number of churches with the Celtic type of narrow chancel arch was, in England, small in comparison with those that followed the Romanesque model with wide chancel opening when the great revival of church building took place at the beginning of the eleventh century, and we should be disposed rather to assign the form of our chancel screens to a development from the *cancelli* of Romanesque churches in Italy.

Mr. Bligh Bond, in our view, attaches too much importance to the "triple choir-arcade," and goes too far in asserting "that the tendency has always been in favour of a type of chancel partition in which arched openings, three in number, are set in a solid wall," and that "in England the triple division, the arcuated form, and the maintenance of the upward enclosure were never lost sight of." We fancy that he has been too much influenced by the occasional occurrence of a triple-arched arrangement in Devon, for he gives us as an example of the "West Country type" Marwood in North Devon, in which the *motif* is clear. But his book illustrates very numerous examples even in Devon in which there is no indication of an arcade limited to three or suggestive of three main divisions. Certainly no such restriction prevails to any considerable extent in East Anglia nor we believe even in Devon, let alone the West Country as a whole. In our observation the screen may consist of three, five, seven, or more main divisions, and though the central one with the doorway may be and often is emphasised by substantial mullions or door posts, which were required as much from structural necessity to carry the doors as to emphasise the entrance to the chancel, this can scarcely fairly be claimed as connoting a symbolic division of the screen into three main divisions.

The account given of the iconostasis of the Greek Church, the jubé of the Continent, and the rood-loft of England is more descriptive and less controversial than that of the origin and growth of the rood-screen, and if we adopt the usual view that these features are lineally descended from the ambones of the Early Christian churches, it is easy to follow Mr. Francis Bond's theory that the screens were the development of the supports of the rood-beam and loft. For ourselves we cannot accept this theory, as the mediæval rood-beams did not require intermediate support, and if they had would have found that of the screen altogether insufficient.

Of the description and illustration of the screens of Somerset, Devon, and Cornwall nothing can be said but praise, whilst Part III. of the book, which deals with the figures painted on the panels of Devonshire screens, with an alphabetical list of the Saints and other personages depicted, is a most valuable contribution to the iconography of English screens. The illustrations are well

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[From "Rood-Screens and Rood-Lofts."

SCREENWORK AT SOUTHPOOL, S. DEVON.

chosen and excellently produced, and put clearly before us the superiority of the West Country woodwork. The respective merits of East and West in respect of screenwork can be put in a nutshell. East Anglia for colour, the West Country for carving. Whilst we regret that Mr. BLIGH BOND and Dom BEDE CAMM have not been able to do justice to East Anglia, we feel that the thanks of all who are interested in English ecclesiastical art are due to the authors for their able and complete exposition of the screens of Devon and the adjacent counties of Somerset and Cornwall.

NOTES AND COMMENTS.

THE present Editor of *The Architect* desires on this the first occasion that at this season of the year the paper has been under his direction to offer to all his readers his best wishes for a Happy Christmas, and to hope that neither the "flu" or other ailment, nor the depression of business has hit them so hard as to prevent them from following the inclination to be of good cheer. He also wishes to thank his numerous friends and acquaintances in the architectural profession for their encouragement, their sympathy, and their assistance in carrying out the duties of his new *rôle*, and particularly those who, by permitting him to illustrate their drawings and buildings, by their contributions, and by their advice or suggestions, have done so much to lighten his labours and to render them more pleasant. Although it has not always been possible up to the present to adopt the advice or suggestions given, these have always received serious consideration, and will continue to do so.

WE are pleased to note that Mr. THOS. G. JACKSON, R.A., has followed the lead we have given in these columns and lent the support of his powerful influence, *apropos* of the LUCAS or LEONARDO wax bust, to call the attention of the general public, in a letter to the *Times*, to the "*reductio ad absurdum* of the ways of dealers and collectors at the present day" that this incident exhibits. It behoves all true friends and lovers of Art to use every endeavour to open the eyes of the wealthy Philistine to the manner in which he is being exploited by the dealers in antiques. It is an excellently pretty game, and a profitable one—to the dealers—to run up the prices they give for antiques to fabulous figures, safely relying on the assurance that someone will buy from them at a percentage of profit. Of course, the higher the price the bigger the percentage, but one hardly credits the American millionaire, who falls into the trap, with the smartness that one would naturally suppose was his qualification for gathering the millions. One cannot do better than repeat the words of VASARI that Mr. JACKSON quotes, "Things modern are as good as things old, provided they be excellent, for it is mere vanity in those who run after names rather than deeds. Men of this sort are to be found in every age, who take more account of appearance than of reality."

THE present inflated prices, though an excellent thing for those who are in the swim, must be hitting somewhat severely the lesser lights amongst the dealers in art who have not huge capital behind them, and we would suggest that the present is a favourable time to work a little boom in moderns, on a lower plane, but on similar lines, to those of the princes of the business who work with antiques. After all, there are not a great many men, even in America, who can spend a million dollars on one picture; but there are plenty who would exult, vain-gloriously if you like, in paying a score of thousands for a modern picture. Yes, there is money to be made by the skilful work of *agents provocateurs* in rousing the vanity of the *nouveaux riches* to the delight of paying high prices for works by modern artists.

WE congratulate Mr. J. W. SIMPSON on the Report of the Committee on the Law of Copyright, which has just been issued, for we consider that it is largely due to his able advocacy that we read, "The Committee, by a large majority, have come to the conclusion, after due consideration of the evidence, that it is desirable to recommend that architecture be accepted as matter to be protected, both for the sake of uniformity and because it deserves to be protected, and presents no difference in principle from that applicable to the sister arts." We hope to deal more fully, on a future occasion, with the subject of copyright in architecture as affected by the Report of the Committee on the Law of Copyright.

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THE custom of decorating streets at Christmas time to attract buyers to shopping centres is becoming general. Doubtless because it is the first effort in this direction on the part of the shopkeepers in High Street, Clapham, there is absent the spirit of appropriateness in their scheme. Ascending High Street the first premises are respectively, on the right hand and left hand, a public-house and a pawnbroker's. Stretched between, and attached to each, there is a huge banner inscribed "A Happy Yule Tide to all our Patrons." Is this meant to point the cause and effect?

THAT clay may be a "mineral" sometimes is clear from the judgment of the House of Lords on an appeal from a decision of the Court of Appeal affirming the judgment of Mr. Justice EVE in the case of the Carpalla United China Clay Company, Ltd., and Viscount CLIFDEN *v.* Great Western Railway Company, that china clay is a mineral under the Railway Clauses Consolidation Act, 1845. The solution of the conundrum, "When is clay a mineral?" depends, therefore, on its rarity and its specific value as a variant from ordinary or common clay.

AN important decision has been given by the Tribunal of Appeal under the London Building Act, 1894, in respect of the building line of the Euston Road between Hampstead Road and Osnaburgh Street. As most of our metropolitan readers know, the actual frontage line of the street here is formed by a heterogeneous collection of buildings brought up to the pavement apparently by building over the forecourts or gardens of houses that at one time stood back a considerable distance from the road, and so producing about the most higgledy-piggledy piece of street architecture that London can show. The Superintending Architect of the London County Council defined the general line of building as a continuous line from Hampstead Road to Osnaburgh Street, about fifty feet from the edge of the pavement all along, which, from an architectural point of view, would have been admirable. The Tribunal of Appeal has, however, to consider law as well as, or rather in preference to, æsthetics, and, no doubt with reluctance, has come to the conclusion that for part of the distance only can they support the Superintending Architect's line, that for part the buildings front to Osnaburgh Street and the Hampstead Road, and that for the remainder there is no general line of buildings. This results in absolute chaos. We understand that there will be a further appeal against the decision of the Tribunal.

THE Mayor of Liverpool entertained on Saturday last a number of friends of the project now carried to a successful issue, of decorating four lunettes of the main hall of the Town Hall with pictures by Mr. J. H. AMSCHEWITZ, representing the granting of the charter to the borough by King JOHN, Liverpool as a centre of commerce, Industry and Peace, Education and Progress. The funds were provided from the surplus of the pageant held in 1907, and Mr. F. J. LESLIE, Chairman of the Pageant Committee, performed the ceremony of unveiling, Alderman RADCLIFFE accepting the gift on behalf of the city. By the way, the pictures are not frescoes.

A SERIES of lectures on Arts connected with Building is to be given once again at the instance of the Worshipful Company of Carpenters, on Wednesday evenings, commencing on January 12 of next year. The subjects announced are, "What is Artistic Craftsmanship?" by Professor BERESFORD PITE, F.R.I.B.A.; "The Art of Building, with special reference to the use and abuse of materials," by Mr. H. BAILLIE SCOTT; "The Carpenter's Craft," by BANISTER F. FLETCHER, F.R.I.B.A.; "The Joiner's Craft," by Sir A. BRUMWELL THOMAS, F.R.I.B.A.; "Native Craftsmanship in Timber, Brick, and Stone before the Eighteenth Century," by ARTHUR STRATTON, A.R.I.B.A.; "The Art of the Lead Worker," by LAURENCE WEAVER, F.S.A.; "The Art of the Plasterer," by GEORGE P. BANKART; "Castles in the Air," by C. F. A. VOYSEY; "The Use of Coloured Materials in Building," by HALSEY RICARDO, F.R.I.B.A.; "Mural Painting," by Professor GERALD MOIRA; "Coloured Reliefs and Mosaic," by R. ANNING BELL, R.W.S.; "Sculpture as applied to Buildings," by F. W. POMEROY, A.R.A.; "The Craft of Repairing Buildings," by THACKERAY TURNER, F.S.A., F.R.I.B.A. We do not think we have ever seen a better programme announced by the Worshipful Company of Carpenters. Admission will be free by ticket to be obtained from J. H. FREEMAN, Esq., the Clerk to the Company.

THE Survey of the Memorials of London is a work that has been hitherto carried on by the Committee for the Survey of the Memorials of Greater London, and also by the London County Council, and there has been consequently some danger of overlapping and of distraction in the minds of the public. This is now by way of being obviated, and the General Purposes Committee of the Council report as to the future arrangements as follows:—

A large amount of material suitable for publication has been collected both by the Council and by the Survey Committee (now known as the Committee for the Survey of the Memorials of Greater London). We have for a long time held the opinion that, having regard to the rapidly changing character of London, the continuation of the work should be no longer delayed and that it should be proceeded with under the supervision of the Council. As the result of prolonged negotiations with the Survey Committee the proposals hereinafter set out have been provisionally agreed, which will prevent overlapping, and will provide for co-operation between the Council and the Survey Committee in carrying out the work of the survey of the memorials of London in future. It is proposed that the agreement shall remain in force for five years, at the end of which period the Council's position in the matter may be reviewed.

It is not anticipated that there will be any expenditure during the current financial year in respect of the work, but in future it is hoped to publish at least one volume each year. The cost of publication of each of the volumes, which so far as at present can be foreseen will number upwards of fifty in all, will necessarily vary, but the average cost will probably be about 140*l.* a volume, and in addition there will be the cost, estimated at 50*l.* a volume, of taking photographs and copying drawings. In view, however, of the amount of material in hand, it is not anticipated that for the first few years there will be any expense in respect of the taking of photographs and copying drawings. Provision will be made in the estimates for the financial year 1910-11 in respect of the printing of one volume.

The cost of the work will be reduced by the proceeds of sales which, under the proposed agreement, will come entirely to the Council. We are not in a position to make a trustworthy estimate of what the receipts will amount to in future. The total net proceeds derived from the sale of Volume I. amounted to 19*l.*, but the interest of that volume was not very special, and we are of opinion that the regular publication of successive volumes may reasonably be expected to lead to a larger sale for all the volumes. An inducement to purchasers, other than antiquaries, will be found in the fact that a feature of the volumes will consist in the illustrations of specimens of artistic craftsmanship found in houses included in the survey. These illustrations will be of great use in handicraft centres, &c. The Council will also become possessed of drawings and particulars of historical interest of a value probably far beyond the expenditure involved in producing the volumes, and the obtaining of records of the historical buildings in London, which are fast disappearing, is, in our opinion, well worth the expenditure.

We recommend that an agreement embodying the undermentioned proposals be entered into with the Committee for the Survey of the Memorials of Greater London for the co-operation of the Council and that committee in carrying out the work of the survey of the memorials of London:—

1. All original drawings, photographs, and registers already prepared by the Council and the Survey Committee, or which may hereafter be prepared by them, to be deposited with the Council for reference, except such drawings, &c., as have been lent by their owners for publication only, or on which Mr. C. R. Ashbee has a lien. In the event of the Council withdrawing from the agreement, drawings deposited by the Survey Committee to be returned to them.

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2. Existing registers of parishes to be brought up to date with all additional information collected by the Council and the Survey Committee.

3. Both drawings and registers to be made available for inspection at all reasonable times, to be fixed by the Council, by the members of the Survey Committee.

4. Information supplied by either the Survey Committee or the general public to be suitably acknowledged in the publications.

5. The Survey Committee to prepare drawings and information as heretofore, and the Council to continue the survey work as at present.

6. Subsequent volumes of the "Survey of London" to follow the model of the "Survey of Bromley-by-Bow"; such volumes as are prepared in the main by the Survey Committee to be issued under the acknowledged editorship of their editor, Mr. Philip Norman, and an interchange of proofs to be effected between the Council and the Survey Committee before the publication of any volume.

7. Publications to be issued from time to time in the joint names of the Council and the Survey Committee, the Council to bear the cost of production and take the proceeds of sale; but, in return for the assistance rendered, the Council to supply the Survey Committee, free of charge, with such number of copies (not exceeding 250) as will enable each active member and each member of the Survey Committee subscribing not less than 1*l.* 1*s.* a year to the Survey Committee's funds to be furnished with a copy of the volume.

8. The Council to recognise the volume relating to the parish of Chelsea already issued by the Survey Committee as forming Volume II. of the series of volumes to be issued.

9. The Survey Committee to present the Council for its own use, and not for sale purposes, with fifty copies of part I. of the volume relating to the parish of Chelsea.

10. When the Council and the Survey Committee shall have agreed to publish a volume of the general survey, the question to stand referred to a publishing committee, the constitution of which committee is to be hereafter agreed, composed of members of the Council and members of the Survey Committee, to arrange details; but all questions relating to finance to be excluded from the reference to the publishing committee, and to be in the hands of the Council.

11. Any future monographs that the Survey Committee may prepare with reference to buildings in the County of London not to be published until after the issue of the volume of the "Survey of London" dealing with the parish in which the building is situated; this arrangement to be without prejudice to the publication of a monograph on Morden College.

12. The agreement between the Council and the Survey Committee to remain in force for five years; and that the clerk of the Council and the solicitor do complete the matter.

THE Committee also report with reference to the interesting church of All Hallows, Barking:—

There has been brought to our notice a proposal of the Metropolitan and District Railway Companies to rebuild Mark Lane station. The proposal includes a scheme to erect over what is now practically a ventilating opening, buildings to a height of from 26 to 34 feet. As buildings of this height would seriously interfere with the view, from the north side, of the church of All Hallows, Barking, which is an exceptionally fine specimen of fifteenth-century Gothic architecture, containing much fine wood carving and many ancient monumental brasses, and one of the few churches that escaped the Great Fire of London, endeavours have been made to secure a restriction in height of the proposed buildings. At the instance of the Council certain modifications have been made in the plans which will lessen to some extent the obstruction to the view of the church, and we have caused a letter to be addressed to the Corporation of the City of London expressing the hope that it will take any action it can to secure an unrestricted view of the church.

SHORT METHODS OF CALCULATION FOR CHECKING REINFORCED CONCRETE WORK.*

By E. FIANDER ETCHELLS, F.P.S., M.M.A., A.M.I.M.E.

THE main purpose of this paper is not so much to show how the formulæ in reinforced concrete work are derived, as to show how they are applied in checking an existing design.

It is presumed that a set of plans have been placed before the municipal engineer, and that he is required to express an opinion upon the strength of the construction from the point of view of public safety.

In this paper it is assumed that the calculations must comply with the requirements of the Royal Institute of British Architects' report, but the notation will be on the "initial letter" principle, as worked out in the standard notation recently put forward by the Concrete Institute.

It should be noted that there is no conflict of principle between these two reports, but the adoption of a systematic notation should make the formulæ of the R.I.B.A.'s report less irksome to all who have not a long memory for algebraical symbols.

Now there are so many points to be observed, both in the design and in the checking of the design of reinforced concrete work, that they could not possibly be dealt with in one short paper.

The utmost that can be attempted here is to give a few equations for testing the strength at salient or critical points.

If the design passes these tests satisfactorily, it can be more closely examined. If it does not pass such test it should be referred back for reconsideration or revision.

One of the earliest points to be observed is to ascertain what loads have been allowed for in the case of arches, pillars, beams, &c., and what angle of repose and what weight of material have been taken in the case of retaining walls, bins, silos, &c.

The relentless force of merciless competition and the blind worship of the lowest tender both help to reduce the standard of strength.

Unfortunately the competition is not always upon a just and fair basis.

If it is specified that the stresses shall be in accordance with the R.I.B.A.'s report, one designer may still undercut all the others by taking very light loads or very high angles of repose, or by taking low values for any of the factors not within the special province of the R.I.B.A.'s report.

This preliminary reduction of loads or pressures is a very common means of obtaining a low tender. In asking for tenders the loads and pressures to be carried should always be fully specified.

In checking designs the data as to loads and pressures should always be examined at the outset, and before touching a single equation.

The fact that the calculations finish up neatly by showing the stresses to be within the limits set by the R.I.B.A.'s report is no proof of sound construction, unless the "loading" data is right, and unless the assumptions made in the calculations conform with irrefutable fact.

The following equations (wherever they contain numerical coefficients) are for use with concrete having a crushing strength of at least 2,400 lb. per square inch twenty-eight days after moulding:—

Pillars with Longitudinal Rods, and without Spiral Hooping.

Notation.

A = total cross-sectional *area* of a *pillar* (including the reinforcement) (square inches).

A_L = total cross-sectional area of the longitudinal steel rods (in square inches).

P = the total *pressure* on the pillar (in thousands of pounds).

c = the *compressive* stress intensity on the concrete (in thousands of pounds per square inch—usually about 0.5 thousands—*i.e.* 500).

c_s = compressive stress intensity on steel.

For the purposes of calculation c_s is to be taken as being = 15c.

The value of c should not exceed 500 lb. per square inch for the concrete specified. It follows that c_s shall not exceed $15 \times 500 = 7{,}500$ lb. per square inch (say $3\frac{1}{3}$ tons).

Therefore all those designs which stress the steel in pillars to 7 or $7\frac{1}{2}$ tons per square inch, and assume that the concrete will take the rest, must be referred back for amendment if the R.I.B.A.'s report is to be complied with.

$$c = \frac{P}{A + 14 A_L} \qquad \text{(Equation I.)}$$

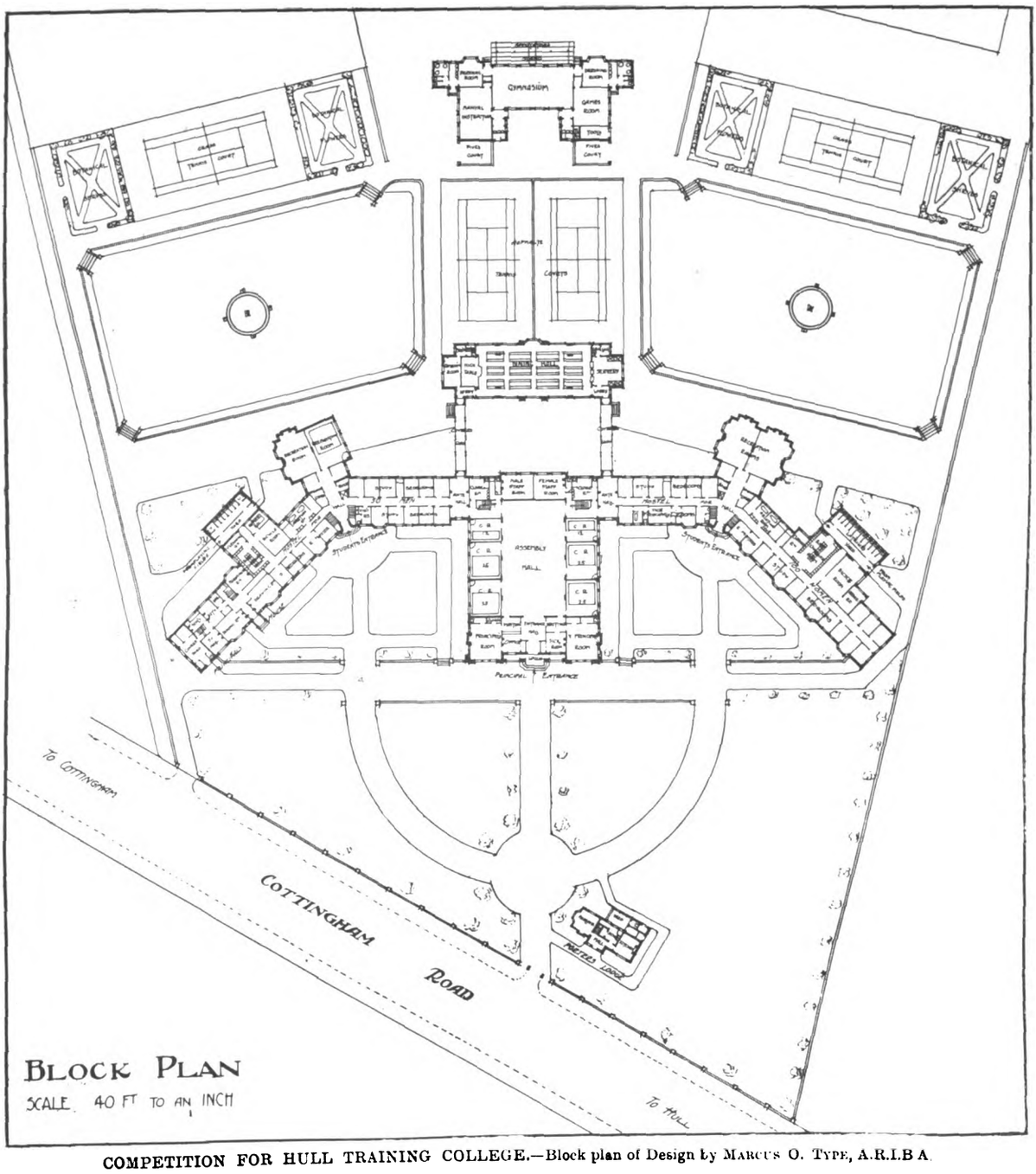
$$c_s = 15c = \frac{15 P}{A + 14 A_L} \qquad \text{(Equation II.)}$$

$$P = c(A + 14_L) \qquad \text{(Equation III.)}$$

By putting c at the maximum safe value of 500 lb. per square inch, P in Equation III. will give the total maximum safe pressure on the pillar in pounds.

* A paper prepared for the meeting of the Institution of Municipal Engineers on December 11.

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COMPETITION FOR HULL TRAINING COLLEGE.—Block plan of Design by Marcus O. Type, A.R.I.B.A.

If we work in thousands of pounds, so as to reduce the amount of figuring, we get the following equation:—

The total safe pressure or load on a pillar in thousands of pounds = P where

$$P = \tfrac{1}{2}(A + 14\,A_L) \qquad \text{(Equation IV.)}$$

The $\frac{1}{2}$ in this equation is not merely a vulgar fraction; it represents half a thousand pounds per square inch.

In using any of the above equations the following conditions should be complied with:—

(1) The load should be static and axial (*i.e.* not eccentric).

(2) The length should not exceed eighteen times the least diameter.

(3) The horizontal bindings should not be further apart than one-third of the least diameter of the pillar.

(4) The reinforcing rods should be near the outside of the pillar, but not nearer than their own diameter.

The R.I.B.A.'s report does not determine the minimum diameter of the bindings, but where round rods are used they are usually about $\frac{3}{16}$ inch to $\frac{5}{16}$ inch, according to the size of the pillar, and the load, and the spacing, and the quality of the concrete.

Rectangular Beams with Tensile Reinforcement.

In the case of plain concrete beams the neutral axis is assumed to lie at the centroid of the cross-section, but in reinforced beams such a beautifully simple assumption is untenable on account of the disturbing influence of many complex and indeterminate factors. The actual neutral axis is a shifting and fugitive line which even varies with the intensity of loading. The neutral axis referred to in ordinary practice is a hypothetical neutral axis, which is placed on "the safe side of uncertainty."

One of the basic assumptions which guide us in fixing the position of this nominal neutral axis is that "the tension in the concrete is negligible."

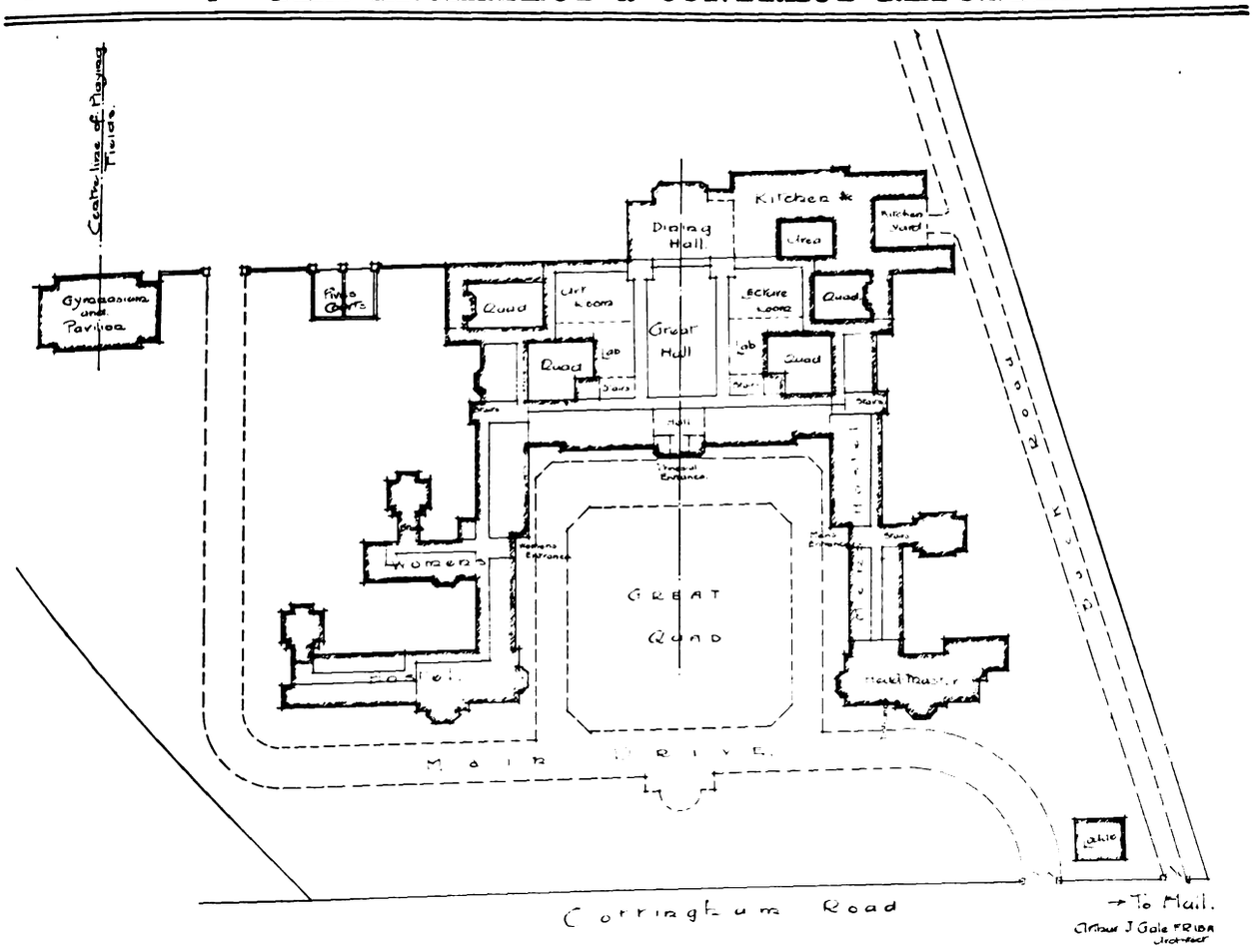
Let us examine this assumption for a moment, in order that we may be satisfied thereon.

With a concrete which crushes at 2,400 lb. per square inch the ultimate tensile resistance will be about one-tenth of that amount—say, 240 lb.

Now, on account of the difference in the elasticity of steel and concrete, equal deformations will not give equal stresses.

If the modular ratio (*i.e.* the ratio between the elastic moduli of steel and concrete) be taken at fifteen, then for low stresses the stress on the steel will be fifteen times the

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COMPETITION FOR HULL TRAINING COLLEGE.—Block plan by A. J. GALE, F.R.I.B.A.

stress on the concrete at the same distance from the neutral axis.

Conversely the stress on the concrete will be one-fifteenth of the stress on the steel. When the tensile stress on the steel was 17,000 lb. per square inch, the tensile stress on the concrete would appear to be 17,000/15=1,134 lb. Now this 1,134 lb. is about 4.7 times (nearly five times) greater than the ultimate tensile strength of concrete, and yet to the casual observer no cracks are seen. What has happened? It was at one time thought that the tensile strength of concrete was raised by the steel helping the concrete across the weakest parts. Some such action may occur, but not to the extent which the credulous affirm.

The latest and most careful laboratory experiments reveal the presence of multitudinous microscopic cracks—smaller than hair cracks, and too small to be seen by the naked eye.

Of course, as the loading is proceeded with, and the yield point of the steel is approached, the cracks widen out prior to absolute failure of the beam.

We see, therefore, that at the ordinary working stress of the steel the tensile resistance of the concrete has been exceeded.

Therefore we are justified in neglecting it in our calculations for finding the position of the neutral axis.

Rather than here submitting a rigid mathematical proof of the exact position of an hypothetical neutral axis, it perhaps would be more helpful in the checking of designs to submit this large scale diagram which shows the position of the neutral axis for various ratios of steel and concrete.

The points on the curve were found by the following equation:—

$$\frac{n}{d} = \sqrt{\left(r^2m^2 + 2rm\right)} - rm, \text{ where}$$

n = distance of the *neutral* axis below the compressed edge (inches).

d = effective *depth* of the beam, measured the compressed edge to the axis of the tensile reinforcement.

b = *breadth* of the beam.

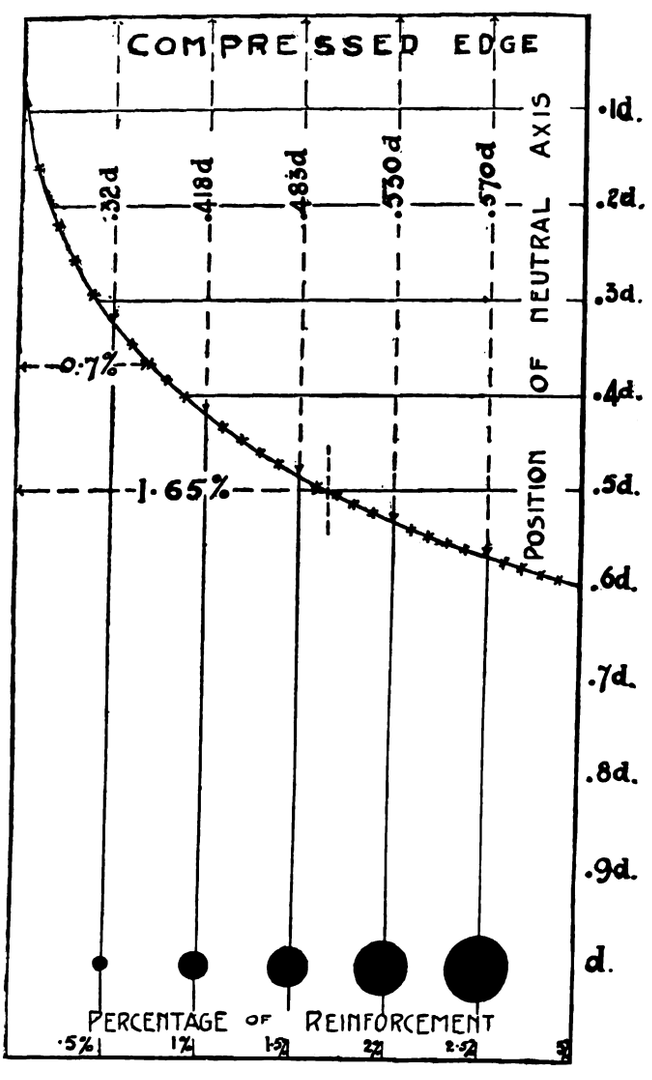
A_t = *Area of tensile* reinforcement.

$r = A_t / bd$ = *ratio* of area of reinforcement to area of concrete.

m = modular ratio $= E_s / E_c = 15$.

The area of concrete in compression will be $b\,n$.

The compressive stress at the compressed edge will be $= c$.



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The compressive stress at the neutral axis will be zero.
The mean compressive stress will be

$$\frac{c+o}{2} = \frac{c}{2}$$

The centre of the compressed *force* will be at a distance $= \frac{n}{3}$ from the compressed edge, or at a distance of $d - \frac{n}{3}$ from the axis of the tensile reinforcement.

The resistance moment of the concrete will be $= R_c$.

$$= \begin{pmatrix}\text{Mean}\\ \text{stress}\end{pmatrix}\begin{pmatrix}\text{Area}\\ \text{stressed}\end{pmatrix}\begin{pmatrix}\text{Lever}\\ \text{arm}\end{pmatrix} =$$

$$= \frac{c}{2} \cdot bn \cdot \left(d - \frac{n}{3}\right) =$$

$$= \frac{1}{2} cbn \left(d - \frac{n}{3}\right)$$

Let t = the tensile stress on the steel.
The resistance *moment* in terms of the tensile stress on the steel $= R_T$ where

$$R_T = t \cdot A_t \cdot \left(d - \frac{n}{3}\right)$$

As the beam may fail by excessive compressive stress on the concrete, or by excessive tensile stress on the steel, the lower of the two values R_c and R should be taken as the measure of the resistance moment.

It is hardly likely that the amount of steel in tension and the amount of concrete in compression can always be so evenly proportioned that neither would fail before the other.

The consequence is that, from the economic standpoint, there is usually an excess of steel or an excess of concrete.

In the case of rectangular beams with tensile reinforcement only, the critical or economical ratio is about $\frac{2}{3}$rds of 1 per cent.

For a lesser percentage of metal the beam will fail on the tension side, for a greater percentage of metal the concrete will give way first by crushing along the compressed edge.

[These remarks, of course, apply to beams which fail by bending; the question of failure through excessive sheer stress is not before us for the moment.]

When there is less than .67 per cent. of steel, the resistance moment may be taken as being approximately

$$\left(t \cdot A_t\right)\left(\frac{7}{8} d\right)$$

If the steel be stressed up to $7\frac{1}{2}$ tons per square inch, and if the percentage of steel does not exceed .67 per cent., then the following simple rule may be used:—

Let R_c = the resistance moment of the tensile reinforcement *in thousands of inch-pounds.*
A_t = area of tensile reinforcement in square inches.
d = effective depth in inches—*i.e.*, the distance from compressed edge to axis of tensile reinforcement.
Then $R_T = 14{\cdot}7\ A_t \cdot d$.

When there is more than 0.67 per cent. of reinforcement the *compressive* resistance will be the determining factor.

When there is more than .67 per cent., and not more than 2.5 per cent., the following approximate rule, devised by the author for his own use for rapid checking, may be employed. This rule does not necessitate any conscious use of the troublesome neutral axis:—

Let R_c = the *compressive resistance* moment in thousands of inch-pounds.

p = the *percentage* of reinforcement $= 100r$ since $r = \frac{p}{100}$

Then

$$R_c = \begin{pmatrix}90 + 20p\\ 1{,}000\end{pmatrix} bd^2$$

b and d being the breadth and depth respectively. (This rule is for concrete stressed up to 600 lb./ins.^{2} along the compressed edge.)

For example, take a beam with 2 per cent. reinforcement, the exact value of R_c would be

$$\frac{130{\cdot}8}{1{,}000} bd^2$$

while the approximate rule would give

$$R'_c = \frac{130}{1{,}000} bd^2$$

(To be concluded.)

ILLUSTRATIONS.

QUENBY HALL, LEICESTERSHIRE.

THE chimney stack on the east elevation and the corresponding one on the kitchen wing were built contemporaneously, and do not form features which existed originally on the façade. A window has been exposed through the recent alterations and casements inserted, and it was thought that a fireplace might have originally existed in the south wall, but such proved not to be the case, and a new flue had to be cut out.

Each room on the ground floor has a similar compartment beneath, and the whole of the floor is supported on brick vaulting.

The exterior of the building is of a very pleasant and bold character, the two side wings and central mass standing well out in perspective. The brickwork is formed with 2-inch bricks laid with the ample mortar joint of $\frac{3}{4}$ inch, and the surface treated with diagonal dark headers.

The whole structure is roofed with leadwork and a parapet wall carried all round. Oak is used throughout, and floors not laid with this material have 2-inch large Ketton slabs and black marble squares.

The entrance gates, which are at present in the Leicester Museum, are good examples of eighteenth-century wrought ironwork, and display similar detail to the smaller gate still extant in the courtyard of the hall.

We shall illustrate these gates next week.

COMPETITION DESIGN FOR TRAINING COLLEGE, HULL.

THESE two designs, by Mr. A. J. Gale and Mr. Marcus O. Type, were amongst the many good schemes that were submitted, and show how varied were the lines on which competitors worked.

INFANT SCHOOL, BRIDGEND.

MR. GRAHAM FAIRLEY'S design is sufficiently explained by the drawing as an example of an unpretentious country school.

SOUTH DOOR, PATRIXBOURNE CHURCH.

THE ancient parish church of Patrixbourne, near Canterbury, is a building in the Norman style. The interior of the nave has undergone a good deal of alteration, but the choir still retains most of its ancient features, including its fine arch and deeply-splayed round-headed windows and a beautiful "wheel" window in the east wall.

The church has a massive tower at the eastern end of the south nave aisle, which has been surmounted by a wooden steeple. On the south face of it there is a very fine round-headed doorway, the arch of which is most elaborately carved with scrolls, foliage, and animals, and is in an excellent state of preservation. The tympanum is filled in with carved work in two series; the upper, evidently representing the Saviour enthroned with the figure of an angel on either side, is much decayed, while the lower, representing some dragons or other grotesque animals, is in a better state of preservation. The caps also are carved with foliage and scroll work.

Above the doorway there is a very curious pediment containing a deeply-recessed niche, having a flat inner surface on which are the remains of a carving in low relief, but it is now very much decayed.

The door itself is modern, and the inner member of the jamb is of wood with markings on it to correspond with the joints of the surrounding stonework.

Unfortunately at some comparatively recent period the tower has evidently showed signs of sinking, and in order to preserve it a massive brick buttress has been built on either side of the doorway, partly obscuring the carved work.

The exterior of the church is almost entirely covered with ivy, which is so thick and tangled that scarcely any of the stonework is to be seen.

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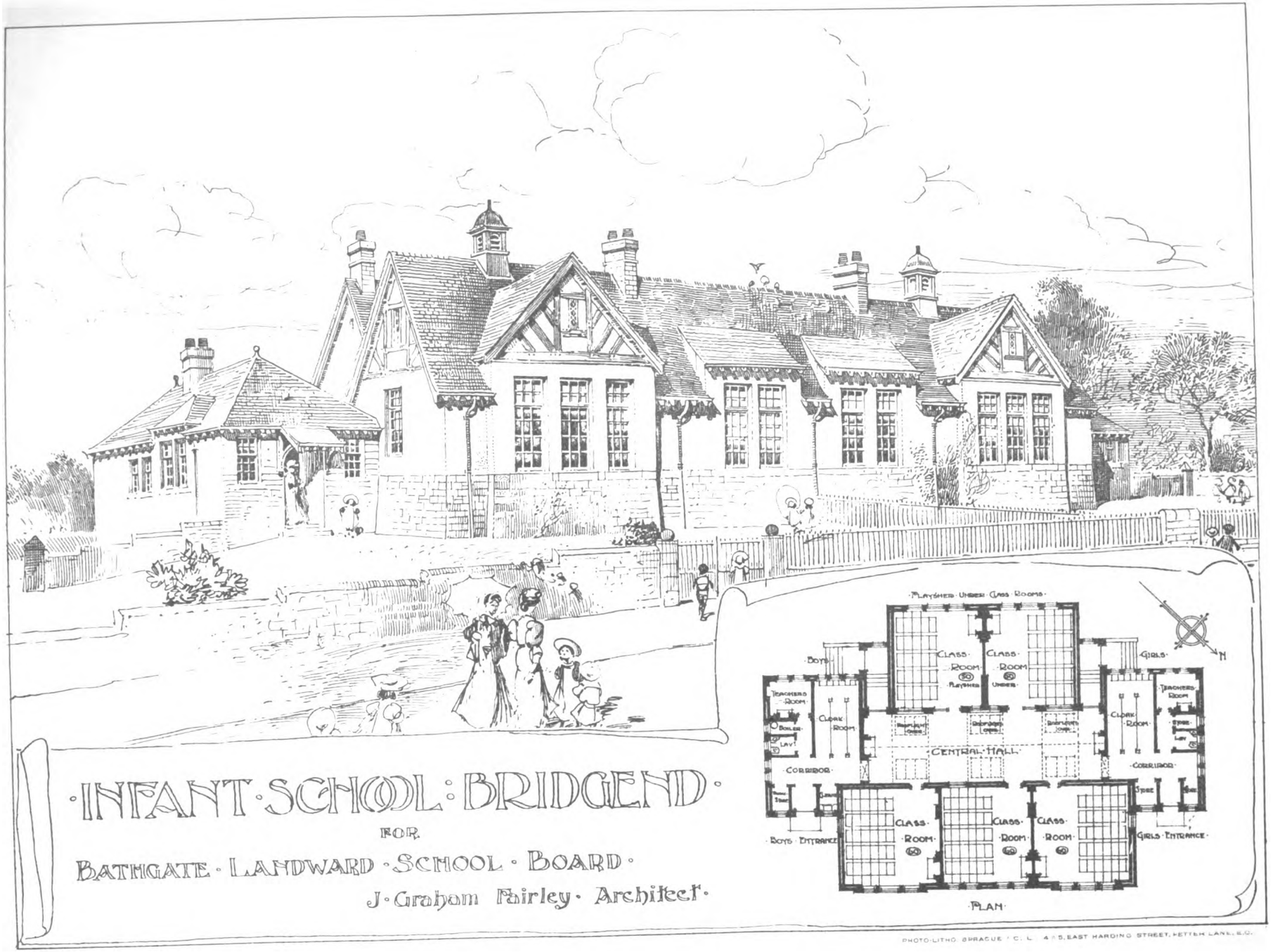
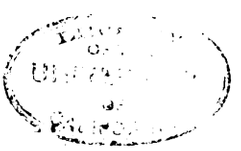


PHOTO-LITHO SPRAGUE & C. L. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

The Architect, Dec. 24th 1909.

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The Perspective View

Competition Design for Training College, Hull.

A. J. GALE, F.R.I.B.A., Architect.

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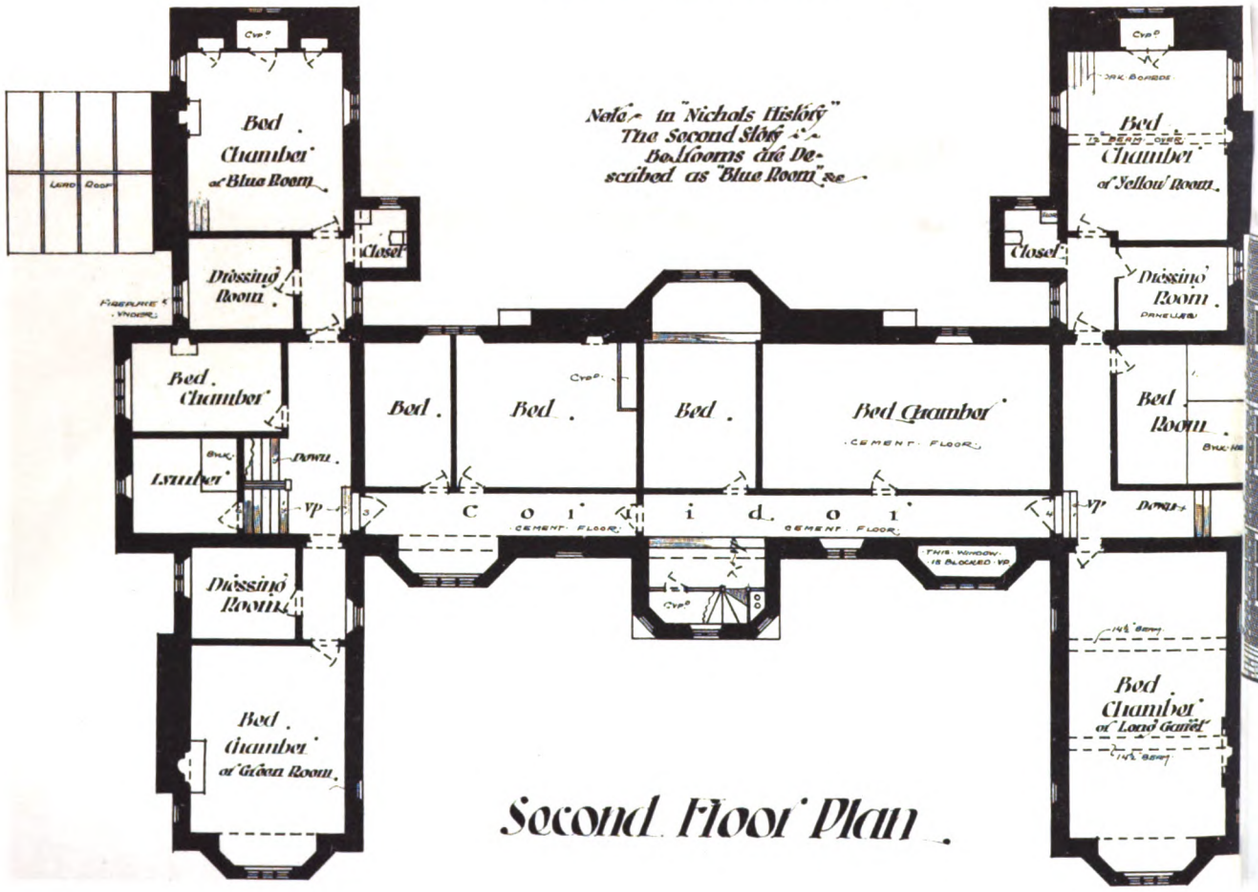


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QVENBY HALL Leicest



North Elevation.

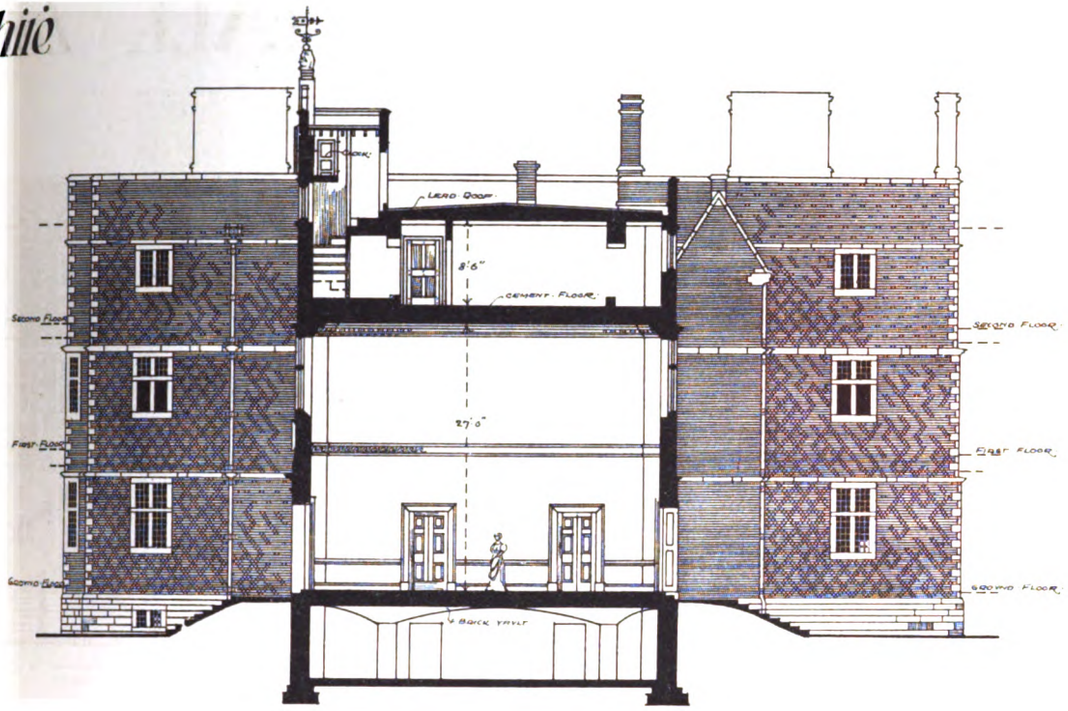


Second Floor Plan.

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Drawing No 2

Cheshire



Section thro Hall.



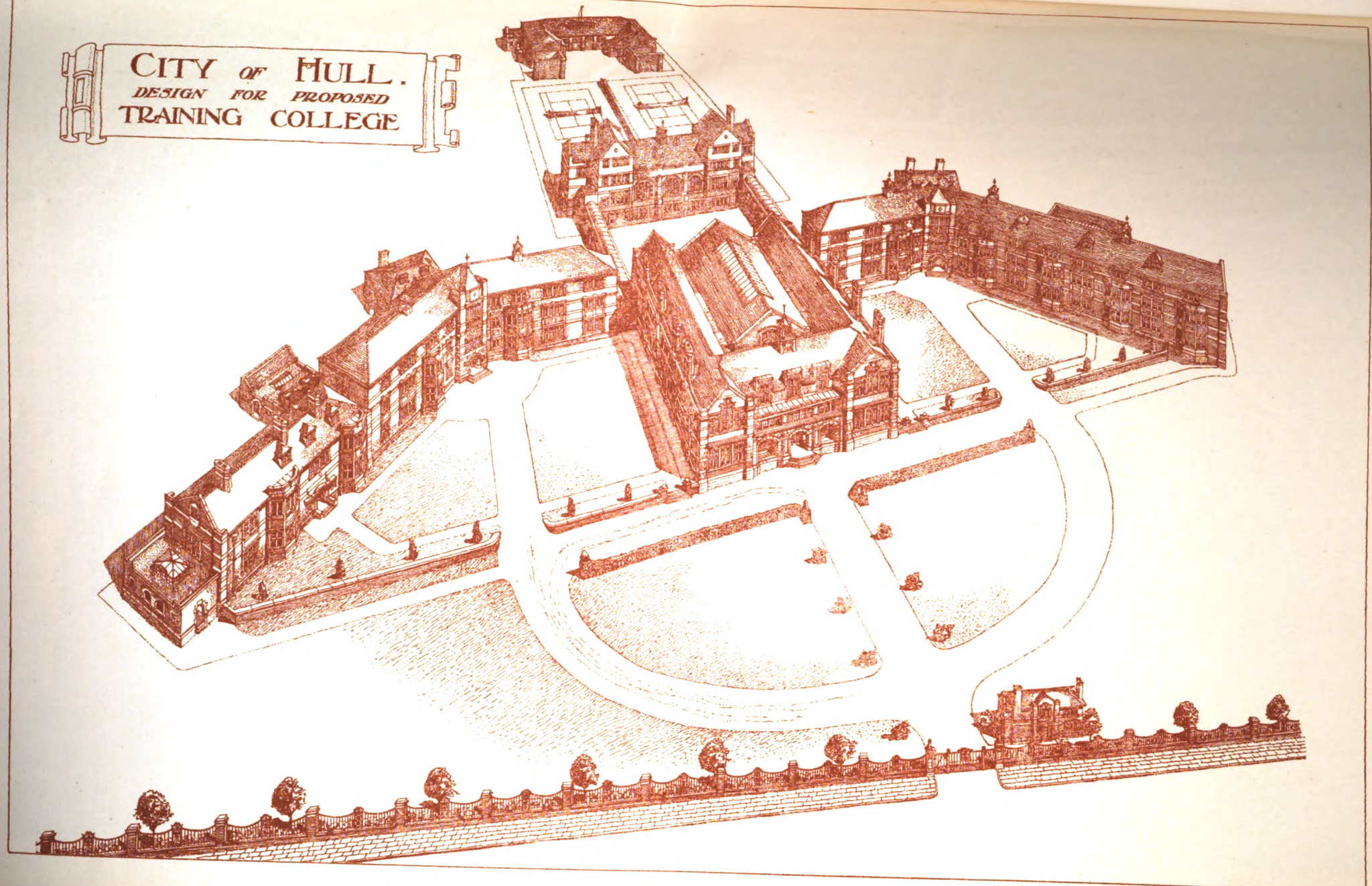
South Elevation.

Scale of 10 0 10 20 30 40 feet

Messrs. A. Dent
W. Sloan. Mills

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The Architect, Dec. 24th 1909.

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COMPETITION DESIGN FOR TRAINING COLLEGE, HULL.

MARCUS O. TYPE, A.R.I.B.A., Architect.

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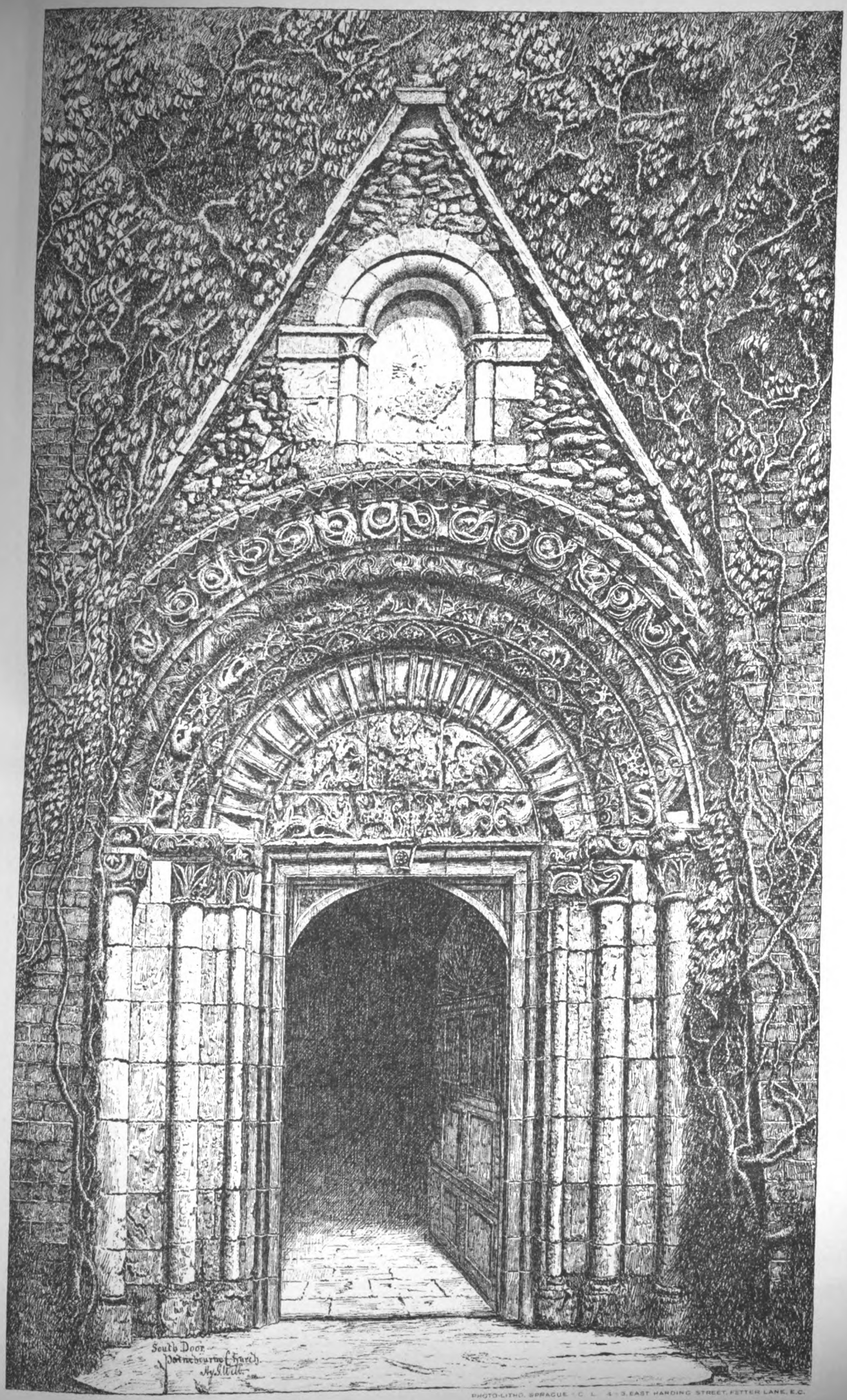


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SOUTH DOOR, PATRIXBOURNE CHURCH.

Drawn by HENRY G. WEBB.

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VARALLO, ORTA AND VARESE.*

(Concluded from last week.)

THE Sacro Monte of Varallo was, as I said, the first and for about 100 years the only thing of its kind. But in 1583 we have the first notice of a sanctuary being in contemplation at Orta. Here again the inspiration came from the Franciscan Order, and was probably suggested by a visit of S. Charles Borromeo to Orta on his return from Varallo. The single narrow street of which the little town of Orta consists runs along the shore of its lake, at the foot of a steep promontory which projects nearly halfway across the water. Its summit is occupied by the sanctuary. Here is a monastery and twenty chapels, standing in a sort of wood, intersected by grassy glades and commanding exquisite and everchanging views of lake and mountain. The entrance arch is approached by a cobbled path bordered by cropped limes. It is surmounted by a figure of St. Francis, in whose honour and to depict the scenes of whose life the chapels were erected. The materials employed here are the same as at Varallo, namely, granite and plaster, but with the addition of a dark serpentine marble, which takes the finest detail, and is used with excellent effect for the smaller moulded members, as caps, bases, and architraves. The lay-out differs from that of Varallo, inasmuch as the chapels have been placed so as to get the best effect from each separate building, rather than with an eye to picturesqueness of grouping.

All the best chapels were erected between the year 1591 and 1630. Dr. Goldhardt—to whose pamphlet I am much indebted—discusses the authorship of these works, and attributes them on evidence which seems fairly conclusive to a Franciscan, Padre Cleto, of Novara. He draws attention to the significant fact that the style is old-fashioned, in fact, about a century behind the times; and suggests the inference that the designer was an amateur of Classic architecture, uninfluenced in the seclusion of the cloister by current movements and fashions, and this by no means to the detriment of his art.

In contrast with the sculptures at Varallo, the figure groups here are of no account: "feeble silly cant," Butler calls them; nor is the arrangement of the darkish interiors so well adapted for their display. But all the more worthy of attention is the outside treatment. Delicacy, economy of means—in many cases the cornices and other members are reduced to their most rudimentary forms—elegance of proportion, these are perhaps the most outstanding notes.

We now come to two more important chapels. They are both simple oblongs surrounded by colonnaded loggias, and it is interesting to observe how from very similar plans two utterly different buildings grow. The first, known as the Madonna of the Angels, from the trumpeting angels on the roof, is the most ornate of all.

The fifteenth chapel, which has been so oddly connected with the name of Michelangelo, is one of those simple, inevitable, and masterly designs wherein consummate art lurks artfully concealed. The attribution of the authorship to the great Florentine master is, of course, worthless, except as evidence of traditional admiration. It is difficult to imagine anything more remote from the austere grandiosity of Michelangelo's manner than the Mozartian urbanity and grace of this little building. We are now on the highest point of the Sacro Monte, and are, therefore, prepared to find, as at Varallo, a circular chapel. The plan is of the utmost simplicity—a plain drum surrounded by a peristyle of twelve slender Doric columns bearing semicircular arches. The stylobate is broken at the cardinal points by flights of steps for access to the ambulatory which is roofed with a lean-to. The plan is the earliest example (1597) of a central block surrounded by a portico, and exercised considerable influence upon the later chapels both here and at Varese. Henceforth all the more important ones display this feature. The eighth chapel is obviously a variant upon the same theme, the octagon being taken as a basis instead of a circle. It is clear from the plan that the ambulatory involved the designer in sundry difficulties. The arches, if only eight in number, would become sprawling and ill-proportioned unless they could be carried to an extravagant height. The difficulty has been overcome by a similar device to that so often employed in the aisle of a Gothic apse, viz. by the division into alternate square and triangular spaces, producing thereby a sixteen-sided ambulatory. In a small late building like this, by no means one of the best of its kind, one is surprised at the feeling for effect, the unerring knowledge and command of every device whereby the desired effect is produced, the freedom in handling difficulties. The squares I spoke of just now in the plan of the ambulatory are not squares, the sides incline inwards towards one another, that was dictated by the proportions of the arches (and an Italian mason is not one to bungle over the irregular vault thereby produced); nor are the faces from which the cross arches spring parallel; that gets over another difficulty; true, it lands you in a winding arch, but as that is only in plastered rubble nobody's bones are broken.

I have dwelt thus at length on the plan of this chapel because, in spite of certain signs of debasement, it is a fair example of the skill with which these obscure masons handled their "Renaissance box of bricks." The next chapel is elliptical in plan—sure evidence of Baroque influence, and the porch seems stuck on. Inside there is a good iron screen. There must have been a school of excellent smiths in this district. Almost every house in the town has a good iron balcony, and the neighbouring villages and churches are rich in ironwork, as well as the Sacro Monte itself. Even when the design is a little riotous the workmanship is careful, and even precise. One of the most charming structures here is the little well-house. The pedestals and caps are pentagonal, which is, I suppose, the only way of getting comfortably round an octagon. The earliest of the chapels is the Capella Cannobbiana, so-called from Abbot Cannobbio, the originator of the whole scheme, and founder of this chapel, in which the canonisation of St. Francis is represented. The last is the Capella Non-finita, the unfinished chapel, which is really more of a belvedere than a chapel. It is a coarse but picturesque object.

The town of Varese is situated on the verge of the plain of Lombardy. About three miles to the north, in the direction of the mountains, and some 400 feet above the town, is the entrance of the Sacro Monte. The general scheme is quite different from what we have seen before; the chapels are not grouped in a confined space, but follow a broad paved road which ascends in zig-zags along a rising ridge. A chapel is placed at each turn of the road, and intermediately wherever a long straight run occurs. The road is perhaps 2½ miles long, and is the main approach to the ancient hill town of St. Maria del Monte, which occupies the summit. The construction of the road was contemporary with that of the chapels, and no little skill and feeling is shown in its disposition and planning. Not only had it to follow the line of least resistance, so far as climbing the hill is concerned; but it is so schemed that the chapels show to the best advantage from below, and also provide the best points of view for the enjoyment of the landscape. Again a Franciscan was the originator of the scheme, the execution of which was entrusted to the architect, Bernascone, of Varese. There are fifteen chapels, in illustration of the mysteries of the Rosary, each group of five being separated from the next by an arch and fountain. With the exception of five late and unimportant buildings all are Bernascone's work, and show him to have been a man of considerable imaginative and inventive power. Though begun only ten years later than Orta, it is quite 100 years later in manner. If the chapels there were the work of a refined and gifted amateur, here they suggest the professional man, quite up-to-date and to all the tricks of the trade. A marked difference is observable at once in the colour of the buildings; we have exchanged the stone roofs and whitwash of the mountain valleys for the tiles and yellowish stucco of the plains. Granite is more sparingly used, and the increased use of stucco instead of stone for ornamental features gives a sort of coarseness that smacks of a declining art.

The plan of the first chapel is similar to two of those at Orta, viz., a colonnaded portico round three sides of an oblong cell. But here the elevations suggest a Classic temple. We now find for the first time view openings in the sides of the building as well as in front. In this case they are rather prettily treated. The second chapel is insignificant, and at the first turn we come to No. III. Here importance is given to the side openings, which became regular transepts. Their treatment is, however, much more successful in the next chapel, which is designed like a domed church on the plan of a Greek cross, the transepts and aisles being as it were turned inside out. The external division of the copper-covered dome into eight unequal segments is noteworthy; the wide divisions corresponding to the transepts, and the narrow to the interspaces. The undue width of the broader divisions is cunningly counteracted by the keel-like form given to them.

Immediately opposite this last is the most important building of the series. It is also the most complicated both in plan and design, but is a fine, masculine piece of work, which, as I

* A paper read at the last meeting of the Architectural Association by Mr. F. C. Eden.

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found on my second visit to Varese, improves greatly upon further acquaintance. The transeptal form of plan is again adopted, in this case grafted upon an octagon. The transepts instead of being connected by arcades, are joined merely by balustrades, which play a curiously important part in the elevation. At first sight it is impossible to believe that they are horizontal. Their raking lines seem to buttress the main portico with a studded effect of support, and cause the whole building to sit securely on the side of the slope. The illusion is increased by the want of parallelism between them and the main block, so that in perspective their lines vanish to different points. You will observe what excellent effect is obtained by tiling the cornices; how by this simple means a very strong line may be produced without unduly coarsening the mouldings.

At the next turn of the road the town on the mountain-top comes into view with something of a shock. The chapel of the Flagellation at this spot has certain good points; a life-size Pietà, most effectively placed over the portico, and some pretty plaster work in the vault. The road now ascends rapidly along the side of a deep valley to the Crucifixion chapel, with an interesting porch surmounted by a delicate pierced iron cross, designed to silhouette itself against the whiteness of the wall behind. The ironwork here is not quite up to the Orta level. It is often enriched with bronze ornaments which have acquired an exquisite patina.

The plan of the Ascension chapel is interesting; an elongated octagon within and an ellipse without, to which is attached a large portico, a sumptuous piece of Baroque design.

The last chapel of Bernascone's is very simply planned. "Ah, me! what perils do environ the man that meddles with" simplicity. It looks so inevitable, and is so full of pitfalls. The vaults of the ambulatory are barrels decreasing both in width and height inwards, sections of a cone, in fact; and the arches which separate them follow the lines of the pilasters from which they spring, so that an angle runs along the soffite, salient for half its circuit, and re-entering for the other half, and just disappearing at the apex.

But we are now at the end of our pilgrimage, which has been, I fear, a rather monotonous one. If what I have shown to-night should induce any of my hearers to visit these remarkable places, in autumn for choice, when the loveliness of the Italian hills is almost incredible, I am convinced that whatever his opinion of the merits of the architecture may be, his visit will not end in disappointment.

Mr. Theodore Fyffe, in proposing a vote of thanks to the lecturer for his paper, said Italy was an extraordinarily fascinating country in the north. The architecture was really distinctive and characteristic of the different localities, and there was a fine Early Renaissance feeling in most of it. Tradition called it generally Bramantesque influence, and the character seemed to be more applicable to Bramante than to Michelangelo. The figures which had been referred to should be looked upon as part of a stage representation, and in that light they became fine compositions.

Mr. Percy E. Newton seconded the vote of thanks, remarking that Varallo, Orta, and Varese were delightful places in which to spend a holiday. The colour in the towns was wonderful, and excursions to them could be made in comfort since the steamers there were not so thronged as at Como and Maggiore.

Mr. H. H. Statham said he was very much struck with the series of examples shown to them on the screen. Italy seemed a wonderfully endless place, for here they had a number of architectural erections which probably few of them knew anything about, and the fact proved that besides the well-known important monuments, the country in out-of-the-way places had objects of real interest. One point which struck him in regard to the various chapels, was the interesting variety of the planning, and in several cases they suggested the advisability when one was formulating a plan to consider how it was going to be treated in the superstructure.

Mr. Arthur Keen said the views exhibited wonderful detail, and although many of those present would feel that the architectural work shown in the buildings was of a rather amateurish and elementary kind yet the detail throughout was very good.

Mr. Gerald Horsley asked the lecturer if he knew whether Gaudenzio Ferrari designed any of the architecture of the buildings. They knew he was the sculptor of several of the groups in terra-cotta and that he probably painted in fresco many of the backgrounds on the walls of the chapels.

Mr. Eden, in his reply, said he had not been able to discover if Ferrari acted as architect for any of the chapels. He certainly was the sculptor of several figures in terra-cotta. The finest sculptor was generally supposed to be Tabacchetti, who overtaxed himself to madness, but he recovered after a few years and resumed work.

DROPMORE PARK AND STOKE POGES.*

Dropmore Park came into the possession of William Wyndham, afterwards Lord Grenville, at the end of the eighteenth century, and was then only a barren stretch of heathland. While still retaining the glory of the purple heather, its surface is now diversified with noble specimens of forest trees from all parts of the world. Wide spreading beeches and oaks mingle with graceful birches and stately cedars, while in that portion of the park known as the Pinetum there are specimens of rare deodaras, pines and araucarias, some of which are of great height. There is also a beautiful Italian garden, and the grounds are adorned with stately urns and busts of eminent men. The area of the grounds is as much as 600 acres. In front of Dropmore a hill was levelled so as to obtain a view of Windsor Castle. On the lawn stands a magnificent cedar of Lebanon, planted in 1794. In the spring and early summer the drives are gay with rhododendron and azalea blossoms. In the autumn the crimson leaves of the mountain ash add beautiful colour to the landscape. Among the curiosities of this place are an oak tree said to have been planted by Elizabeth and an arbour formed by one of the stone alcoves of old London Bridge. In the mansion is preserved a part of the elm tree under which the Treaty of 1681 between William Penn and the first inhabitants of America was signed in the neighbourhood of Philadelphia. The present owner is Mr. J. B. Fortescue, and the public are very greatly indebted to him, not only for his kindness in allowing the park and gardens to be seen, but also for the liberality with which he spends in order that they may continue to be unequalled throughout the length and breadth of Europe. Our fancy can picture Lord Grenville in his declining years spending his time in planting trees and planning landscapes with his thoughts running back to the times when at the age of twenty-three he became a Tory member of Parliament, at thirty Speaker of the House of Commons, then a peer and Leader of the House of Lords, afterwards becoming a Whig and Prime Minister of the Government of "All the Talents" which succeeded in passing the Bill for the Abolition of the Slave Trade. Lord Grenville died at Dropmore in 1834 at the age of seventy-five.

Burnham Beeches are the remains of an ancient forest, and now form a wild woodland tract of almost unique beauty. In 1883 about 380 acres were purchased for 6,000*l.* by the Corporation of the City of London and dedicated to the public for ever. The poet Gray describes it as "a little chaos of mountains and precipices." It is said that during the Civil war Cromwell's soldiers went to the forest and lopped the branches of the trees to provide stocks for their guns. It is probable, however, that the pollarding took place before their day. Finer single trees may be seen in many places, but nowhere so wildly picturesque an assemblage of ever varying giant trunks or such striking combinations of sylvan forms and colours and endless contrast of lights and shadows varied "by glens and valleys, interspersed with little rushy pools, the winter haunt of the snipe and woodcock, and overhung with the rich foliage of the holly, birch, juniper, and other trees, under whose shade the purple heaths flourish, and the fern and foxgloves add a charm and variety to the scene." Of its kind, little is wanting in this forest fragment, and winding forest roads penetrate in all directions, rendering every part accessible.

The history of Stoke Poges goes back to Anglo-Saxon times, when the manor was held by one "Siret, a man of Earl Harold." His lands were confiscated, and when the Domesday Book was compiled in 1086 A.D., the lands were held by William Fitz-Ansculf as "part of that extensive fief which lay in twelve counties and had Dudley Castle for its head." The manor came into the possession of the De Someries family at the end of the thirteenth century, and their tenant—Robert Poges—gave to the parish the name it has held ever since. About 1330 A.D. the manor passed into the possession of Sir John de Molyns and remained in that family for a century. The last heiress of this family married a Lord Hungerford, and later a Hungerford heiress married a Lord Hastings, their son becoming the first Earl of Huntingdon in 1529. The third earl mortgaged the manor and it then passed into other hands. It is supposed from the opening lines of Gray's poem, "Long Story," that Sir Christopher Hatton, Queen Elizabeth's Lord Chancellor, was the purchaser. It is, however, certain that the great lawyer and Lord Chief Justice, Sir Edward Coke, owned the manor from 1591 to 1634. He entertained Queen Elizabeth here in 1601 and presented her with jewels to the value of 1,000*l.*

* Read at a meeting of the Upper Norwood Athenæum by Mr. Arthur J. Pitman.

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Succeeding lords of the manor were Sir John Villiers, Viscount Purbeck, Lady Cobham (the poet Gray's friend), and from 1760 to 1840 the Penn family. The church of Stoke Poges, dedicated to St. Giles, is at a distance of one and a half miles from the village, having been built nearer the "great house" of the parish than to the houses of the retainers and others. As we leave the roadway we approach the church through the lych gate, erected in 1887, the graceful spire of the church rising beyond. The churchyard itself possesses many features of interest, and is so well kept as to render this fact worthy of remark. The plain, not to say ugly, tomb of the poet Gray lies just outside the east window of the Hastings chapel, below which is a tablet re-



DROPMORE HOUSE

cording his burial. He was buried by the side of his mother, whose death caused him so much grief. Opposite the south door is the yew tree known as Gray's yew because he was wont to sit under it and do so much of his writing there. Both church and churchyard have, however, been altered so much since Gray's time that a great deal of the rural simplicity which Gray's Elegy would cause one to picture has been lost. The painted wooden spire was erected in 1831 and the tiled roof covers both nave and aisle in one unbroken sweep. The oldest existing portion of the church is the north wall of the chancel, which has probably been standing since 1107 A.D. It contains a small Norman window as well as two Early English lancet windows, now blocked up. The fifteenth century doorway in this wall probably gave access at one time from the church to a sacristy, which will account for the piscina now low down on the outer wall close to its eastern end. The material of the walls is chalk and flint occasionally arranged in chequer pattern, but for the most part roughly intermixed. On the south-east of the chancel is the Hastings chapel, the Hastings arms being still extant over the door giving entrance to the chapel. It is of red brick, mostly covered with old stucco and with stone-mullioned windows of a plain Tudor type. There was an ancient western doorway, but this has been very injudiciously restored, the lower part being bricked up and the upper portion being turned into a poor window.

Entering by the porch, one cannot fail to notice its front constructed out of two great oak timbers which have stood the strain and stress of all weathers for between 500 and 600 years. Inside we note the massive columns supporting the arches. In 1897 the plaster was stripped from the walls and a flat ceiling removed, opening out a roof whose heavy beams and timbers can now be seen. On the right as we enter is the chantry founded in 1338 A.D. by Sir John de Molyns, containing an aumbry and a double piscina and a modern window of Munich glass. The aumbry and piscina were discovered in 1897 when the walls of the nave were stripped of the plaster. On the left in the south-west corner is a tablet on which are inscribed the names of many of the Penn family. The entrance to the Penn vault is close to the font. The floor of the tower, which is on the left hand as one enters the chancel from the nave, is a faculty pew belonging to the owner of Stoke Park. Immediately over it is the ringing chamber and a gallery for the ringers. This pew and gallery date from 1800 A.D., when the Hastings chapel was turned into a vestry.

The pointed chancel arch is built only of brick and cement. It is supposed that the original arch was a round Norman one of stone, but no traces of it remain. When this act of vandalism was committed there is nothing to show, but in specifications of works done in 1844 we read the following item:—"To clear away the brickwork and enlarge the openings of entrance to chancel, and form an arch agreeably with drawings to be supplied." This was at the time when some of the galleries were erected in the Hastings chapel.

The west window is modern and a good example of Kemp's work. In the north-west corner is a tablet with a beautiful little marble figure by Flaxman and two windows of modern glass.

From the north side of the nave a passage or so-called cloister panelled with oak and containing four indifferent painted windows leads into a low hall or vestibule in which there is some old glass of considerable interest. This is the private entrance from Stoke Park. Four of the windows are filled with Flemish glass probably intended originally for windows of much larger size. The other windows are filled with glass brought from the old manor-house on its demolition in 1790. It displays the arms of Roger Manners, son of Dorothy Vernon, of Haddon Hall; of John Fortescue, a descendant of Dorothy Vernon; of Sir Walter Mildmay, the founder of Emmanuel College, Cambridge; and of the families of Ducie and Pipe, Ducie and Pyott, and Ducie and Sheffield quartered together. Here also is seen what is usually described as the "bicycle" window. As the window is made up of fragments of glass it is impossible to see what was the complete design of which the bicycle is part.

On the south side of the chancel is the Hastings chapel, which has altogether lost its ancient character. In order to include it in the church the south chancel wall has been removed, the opening being finished off with a flat beam. The east end has been screened off to provide a vestry, the organ obscuring the east window. Galleries, fireplaces and a brick flue and chimney have been put in without any regard to the original design and purpose of the building. The numerous hatchments of the Penn family, Howard-Vyse family and others, form, however, a distinctive and interesting feature.

The chancel contains some features of interest. On the north side within the altar rails is a recess—probably an aumbry—the niche or cupboard in which the sacred vessels were kept for convenience. The fifteenth-century doorway, bricked up for many years, has been recently opened and leads through a passage to a new vestry. On the south side of the chancel is a very beautiful Early English piscina.



DROPMORE HOUSE

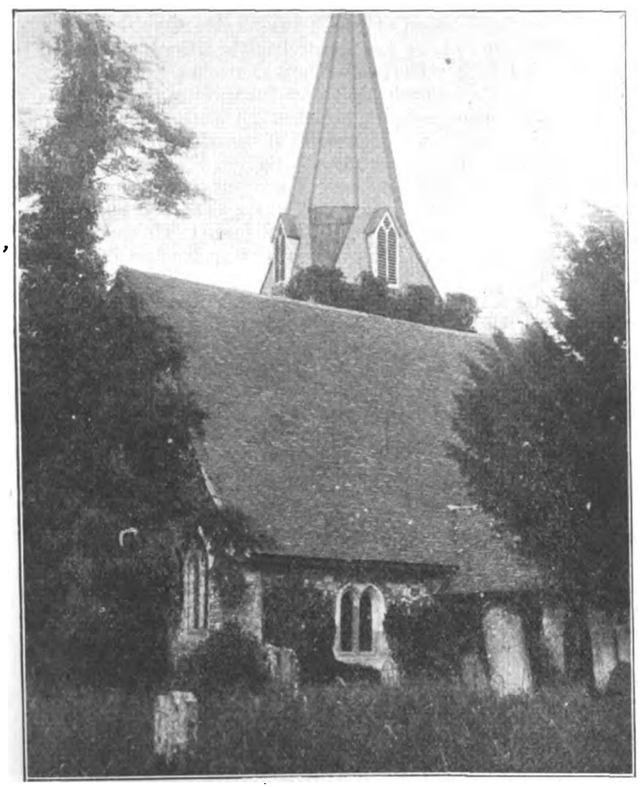
The church contains some memorials which should receive notice. On the north side of the chancel is a tomb supposed to be that of Sir John de Molyns, but the effigy which probably reposed there has vanished. On the wall above is a curious mural monument with cherubs' heads above and skulls below, but with no inscription to tell us whom it was intended to commemorate. But the most ancient monument is the flat tombstone dug up in the churchyard and now lying in front of the De Molyns tomb. A floriated cross is sculptured on it in low relief, and round the edge

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runs an inscription in Norman-French of the twelfth or thirteenth century.

There are three brasses within the altar rails. The oldest on the north side is to Sir Wm. de Molyns and Dame Margaret his wife. Sir William fell in 1425 at the siege of Orleans. On the opposite or south side is the slab where used to be the effigy of their daughter, of which only the inscription remains. In front of the altar is a brass to Edmund Hampdyn and family, relatives of the celebrated John Hampden.

The poet Thomas Gray, who is associated with our visit to-day, was born in London on December 26, 1716. His father was on the Stock Exchange, but he was unsuccessful and indolent, and the welfare of the family depended on his mother, who was a milliner in partnership with her sister Mary in Cornhill. He was one of twelve children, but all the others died in their infancy or childhood. Gray was educated at Eton and at Peterhouse, Cambridge, where he occupied himself with classical literature, history, and modern languages. After leaving Cambridge, he, in company with Horace Walpole, visited Paris, Florence, Rome and other important centres of learning, remaining abroad more than two years. Soon after his return his father died and his mother settled down at Stoke, while Gray gave up his idea of studying for the law and went into residence at Cambridge. The first of his poems appeared in print in 1747, some time after it was written. The post of Poet Laureate was offered to him in 1757, but declined. In 1768 the professorship of modern history—a post for which he had a great



STOKE POGES CHURCH.

desire—was offered to him by the Duke of Grafton. But he did little work, for his health was bad. On July 24, 1771, he was seized with illness while at dinner in the College Hall, and on July 30, 1771, at the age of thirty-four, he died. A few pages hold all his poetry. Still, the reputation which he has achieved by his few pages is extremely high. For while Johnson speaks of Gray with coldness and disparagement others, such as the poet Mason, Mitford, Beattie Cowper and Sir James Mackintosh united in summing up his work as having attained the highest degree of splendour of which poetical style seemed to be capable. Gray himself maintained that the Elegy was not his best work in poetry, and it undoubtedly owes much of its success to the subject, while other productions of Gray exhibit higher poetical qualities. The style he aimed at was, to use his own words, "extreme conciseness of expression, yet pure, perspicuous and musical." "An Elegy wrote in a Country Churchyard," to give the poem the title under which it first appeared in print, possesses all these qualities and became popular at once. It is related that on the night of September 13, 1759, the night before the battle on the Plains of Abraham, General Wolfe was descending the St. Lawrence with a part of his troops. "Swiftly and silently," writes Lord Mahon, "did the boats fall down with the tide, unobserved by the enemy's sentinels at their posts along the shore. Of the soldiers on board, how eagerly must every heart have throbbed at the coming conflict; how intently must every eye have contemplated the dark outline as it lay pencilled upon the midnight sky, and as every moment it grew closer and clearer, of the hostile heights. Not a word was spoken—not a sound heard beyond the rippling of the stream. Wolfe alone—thus tradition has told us—repeated in a low tone to the other officers in his boat those beautiful stanzas with which a country churchyard inspired the muse of Gray. One noble line, 'The paths of glory lead but to the grave,' must have seemed at such a moment fraught with mournful meaning. At the close of the recitation, Wolfe added, 'Now gentlemen, I would rather be the author of that poem than take Quebec.'"

In 1799 Mr. John Penn caused a large monumental cenotaph to be erected in the field adjoining the churchyard at Stoke. The imposing monument, designed by the architect Wyatt, consists of a stone sarcophagus raised upon a massive square pedestal, on three of whose sides are inscribed some stanzas from Gray's poems, while on the fourth side is a suitable inscription.

THE PRACTICAL ADMINISTRATION OF TOWN PLANNING POWERS.*

THE Association under whose auspices we meet to-day was formed ten years ago, and at that time most people looked on Garden Cities and Town Planning with the utmost scepticism.

The original objects of the Association were in part the objects of the new Town Planning Act. To secure the better control and supervision of the growth of new towns and the expansion of old towns, to prevent the haphazard development of vacant urban and suburban land, the consequent development of slums, and the costly process of reconstruction in connection with street improvements; and to encourage the provision of open spaces and the limitation of the number of houses per acre—these were the objects of this Association, and they are now the recognised objects in the law of the country, thanks to the statesmanship of the President of the Local Government Board.

It is notable that the public support secured to the Association in these early days was due in a greater degree to the objections to overcrowded and insanitary housing conditions, than to any belief in a constructive policy in regard to the planning of our towns and cities. In that ten years the education of the public has been remarkable, town planning has become an essential part of the movement for housing reform, its principles have been recognised in many schemes of suburban extension and the establishment of a new town at Letchworth. It has seized hold of the imagination and attracted the practical genius of civic rulers and borough surveyors, it has begun to take its place in universities and colleges of art, the great architectural profession has recognised to a greater extent than formerly the true place of civic design as a branch of study, and the first Town Planning Act has been placed on the Statute Book. It has been a great leap forward, and it is richer in promise than it is in achievement.

In that work of education this Association has taken the most prominent part, assisted by the ideas of Mr. Ebenezer Howard, its founder, the practical experiments of George Cadbury, W. H. Lever, the first Garden City Company, Hampstead Garden Suburb Trust, and others, and the investigations of T. C. Horsfall and John S. Nettlefold.

Of course, I speak of town planning in the sense in which it concerns not only the architect, but also the surveyor, the engineer, the civic ruler, the physician, and the economist.

Civic design has always been a subject of study and interesting speculation among architects, but the limited opportunities of practical work have neither stimulated thought nor encouraged genius in developing the art. Opportunities have come to a few such as Sir Aston Webb and Mr. Unwin, in our own day, but the field is so extensive and the need so great that the workers should be legion. Even under the new Act the scope for the architect is limited and the time is hardly yet when we can bring proper architectural control to bear upon development in our towns. In so far as the new Act will result in the establishment of a stronger architectural

* A paper read at the Guildhall, London, by Mr. Thomas Adams, on December 10.

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department at the Local Government Board, and the appointment of local architects to act in co-operation with borough engineers and surveyors, or in the increased architectural knowledge on the part of surveyors themselves, it will help in developing an improved taste in building design, and a proper sense of proportion and harmony in the development of building areas. But the work to be performed will fall for the most part into the hands of local engineers or surveyors, except in the large cities, where permanent architects are employed. At the same time town planning schemes will only be truly successful if the architect is allowed to take his proper place in their preparation.

The Parts of the Act.

The four parts of the Housing and Town Planning Act deal with:—1. Housing of the Working Classes; 2. Town Planning; 3. County Medical Officers, County Public Health, and Housing Committees, &c.; 4. Supplemental, Provisions as to Commons, Open Spaces, and Land in the neighbourhood of Royal Palaces or Parks.

The first and third parts deal with questions of housing that have from time to time been the subject of previous Acts of Parliament, and contain important amplifications of existing enactments dealing with public health and housing. The provisions of the Act in these respects are important and give a reality to much of previous housing legislation in respects in which it was either unworkable or lacking the driving force of central control over local administration.

Town Planning.

Our object is to consider the administration of the town planning powers created in Part II.

Much of the credit that can be given to Mr. John Burns in connection with this measure is the fact that he has introduced town planning as an essential and integral part of housing legislation. It is notable that although the town planning part of this Act contains the most novel and in some respects the most far reaching of its provisions, it was received by members of all parties with greater favour and less controversy than any other part of the proposals put forward in the Bill which is now an Act. This is due to two or three very evident reasons. Whatever difference of opinion there may be as to the methods of housing reform that have for their object the alteration of existing bad housing conditions, there is no doubt that town planning is a necessary part of any reform which aims at preventing a repetition of these conditions in the future. It is looked upon with more favour as one of the solutions of the problem, because it deals with it at the point of least resistance and its methods involve least hardship to individual interests.

A good deal has been written about town planning during the past two years. We have had the important investigations which Mr. T. C. Horsfall and others have made into Continental town planning, particularly in Germany. Germany has preceded us in this movement by nearly a generation, for reasons well understood by those who have studied German municipal history and institutions. Town planning, involving as it does a certain amount of central control, can be adapted more easily to German than to English conditions. Germany was also later than England in enjoying the commercial advantages of the industrial awakening of last century, and by the time her towns had begun to grow rapidly, as a result of that awakening, modern ideas with regard to sanitation, public health, and town development had taken a firm hold all over Europe. Not an unimportant factor in Germany's advanced thought and activity in this direction is that her towns are managed by permanent mayors and more or less permanent councils, which, by having the benefit of continuous experience and expert knowledge of the causes and effects of town growth, have applied that experience and knowledge in the directions in which the most permanent effects can be obtained.

There is one direction in which England has nothing to learn from Germany. Whereas in Germany town planning leads to centralisation of industries and population, efforts at town planning which have so far been made in this country have either been the result of, or have been concurrent with, movements for decentralisation. Town planning in Germany encourages the creation of wide thoroughfares, high tenement dwellings, small and highly-rated houses closely crowded together, and dear land. In England decentralisation has so far been one of the bedrock principles of what is known as a Garden City movement. We can learn from Germany the commercial value of having wide streets where they are wanted for traffic—planted with trees and laid out with gardens—the desirability of having the main public buildings arranged on sites where they can be seen and enjoyed to the best advantage, and the importance of having the stations, main approaches and main radiating thoroughfares laid out so as to give dignity and strength to our towns; but we have nothing to learn in regard to provision for the happy detached home-life of the people.

Mr. Burns's Act is framed with a knowledge of the conditions which prevail under English local government, and recognises that town planning at least for a time will concern itself chiefly with the proper control of the suburbs and outlying districts surrounding our towns.

The provisions of the Act are shown to be framed to secure this end.

Objects of Town Planning.

The first section of Part II. of the Act (section 54) provides for town planning schemes with regard to any land which appears likely to be used for building purposes with the general object of:—

1. Securing proper sanitary conditions.
2. Securing amenity and convenience in connection with the laying out and use of the land and of any neighbouring lands.

1. *Proper Sanitary Conditions.*—These may be understood to be the conditions usually required to be carried out under the Public Health and Housing Acts and under the by-laws in force in the various districts concerned. So far, those by-laws have been principally applicable to the width and formation of roads, questions of drainage, water supply, &c., but it has not been possible for local authorities to insist upon any conditions which have in view the future development of the land or the development of any neighbouring lands. No doubt by-laws will be altered and strengthened to make it possible for local authorities to be provided with the larger powers contained in this Act, and provision is made for this purpose.

The factors that secure proper sanitary conditions have also some relation to the "amenity and convenience in connection with the laying out and the use of the land." Few authorities, however, would interpret "sanitary conditions" as involving such things as the limitation of the number of houses to each acre, preservation of natural features or other amenities, or the exercise of foresight in regard to traffic conveniences of the future. It is well, therefore, that one of the objects of the Act is to do more than merely to secure what may be technically called "proper sanitary conditions."

2. *Securing amenity and convenience in connection with the laying out or use of the land or any neighbouring lands* is an object which if properly interpreted will lead to much useful work. Considering the extent to which this general object of the Act rests at the basis of town planning schemes to be prepared under this part of the Act, one is led to hope that local authorities and the Local Government Board will interpret it in a generous way. Provision is made in the Act for authorities to receive one half of any increased value which a scheme may be estimated to give to the land included, and if proper consideration is given to the preparation of town planning schemes, they would in nearly all cases appreciate and not depreciate the value of property affected by them. It is generally agreed that the old method of crowding houses on each acre of land without any consideration for the health of the community has been discredited from a business point of view. Investments in such property have seriously depreciated in recent years. Destruction of natural features such as trees, which might with no extra expense be preserved in roads and gardens, may enable land developers to pocket larger ground rents or to receive higher prices for their land at the time of development, but building estates on which such vandalism takes place depreciate much more rapidly than those in which some attempt is made to give good gardens and to preserve the trees. This being so it should not only be to the general public advantage to preserve the amenities of building areas, but it should also be advantageous to those who own the land and the local authority to enjoy an income from the local rates. The question of what is "convenient" in connection with the laying out of land is capable of broad or narrow interpretation, but as it is a matter which has yet to be defined and regulated under the control of a central body of experts, no doubt the broadest construction will be placed upon it, subject to considerations of economy.

TOWN PLANNING SCHEMES.

Having analysed the objects of what is described in the Act as a town planning scheme it might be as well to inquire whether anything in the Act makes it more clear what such a scheme is. We see that the intention is that the schemes should apply to land which is either in the course of development or appears likely to be used for building purposes. It may be prepared by a local authority with reference to any

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MODERN EUROPEAN ARCHITECTURE.

BOHEMIA.



[From *Der Architekt.*

OFFICES OF THE PRAGUE IRONWORKING COMPANY AT PRAGUE.—Baurat J. Zasche, Architect.

land within or in the neighbourhood of their area. Land already built upon may be brought into the scheme if it is thought desirable, and buildings thereon may be demolished or altered.

A scheme may also include (see section 54, sub-sec. 7) land likely to be used as, or for the purpose of providing open spaces, roads, streets, parks, pleasure or recreation grounds.

If we consider the land to which the scheme has to be applied and the objects I have described, we have a fairly clear interpretation of what a town planning scheme is. It will involve the consideration of roads and streets not only from the point of view of the sites immediately served by them, but also from the point of view of their ultimate destination, the future needs of traffic, and the general public convenience.

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BOHEMIA.



[From *Der Architekt.*

DETAIL FROM THE VIENNA BANK'S PREMISES AT PRAGUE.—Baurat J. ZASCHE, Architect.

Questions of drainage and water supply will follow that of road making as a natural course. At present, land is laid out on the principle that everybody's business is nobody's business, and even the owners of large estates are driven by considerations of immediate economy, and the want of co-operative action with other owners, to develop their properties without proper consideration for the future.

Preparation and Approval of Schemes.

Under section 54, sub-sec. 2, the initiative for preparing a scheme rests either with the local authority or the owners of land acting in co-operation with the local authority. Before preparing a scheme of its own or adopting a scheme proposed by owners of land, the consent of the Local Government Board must be obtained and they must be satisfied that there is a *prima facie* case for making the scheme. This scheme may include land already built upon, or land "not likely to be used for building purposes." Such land may be included with the authority of the Board and buildings may be demolished or altered for the purpose. The Board's sanction is necessary before the scheme can have effect given to it, and it may insist on any modifications or conditions.

This is necessary both from the point of view of making purely local schemes to conform to what may be described as county or national requirements, and in order to obtain that central architectural and expert supervision which the smaller authorities will be unable to employ but which the Local Government Board will no doubt have at its command.

No provisional order or private Act of Parliament is necessary and the whole procedure is fairly simple. If, however, any interested person or authority raises a formal objection to any scheme the draft of the Local Government Board order shall be laid before each House of Parliament for thirty days, and if either of the houses object no further proceedings can be taken. If no objection is raised the issue of the order giving the approval of the Board will give effect to the scheme as if it were enacted in the Act, but it may be afterwards varied or revoked in favour of a subsequent scheme, or if satisfactory reasons are given, it may be revoked altogether.

General Provisions.

In view of the responsible position occupied by the Local Government Board it is very desirable that the fullest possible instructions and information should be supplied to the local authorities. The Board is therefore empowered (sec. 55) to prescribe a set of general provisions for "carrying out the general objects of town planning schemes." These provisions will be probably in the form of an amplification of the by-laws. They will not refer to procedure. The procedure regulations are dealt with in sec. 56, with which section I shall deal in due course. The Act very properly provides for having separate sets of these general provisions adapted for areas of different character. Those who have experienced the unsatisfactory results of having a rigid set of by-laws applicable to districts of very varied character will appreciate the desirability of this provision. The special matters to be dealt with in these provisions are summarised in the fourth schedule of the Act. The matters to be dealt with include streets, roads, &c.; stopping up and diversion of existing highways; buildings, public and private open spaces, preservation of objects of interest, sewerage, lighting, water supply, extinction or variation of rights of way, &c., dealing with land, power of entry and inspection, power to alter or remove destructive work, power of authority to make agreements and co-operate with owners, and owners with one another, &c., &c.

Under section 64 these general provisions must be laid before Parliament and they shall become statutory rules under the Act.

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Special Provisions.

Special provisions shall be inserted in each scheme to provide for definition of area, authority, supplementing, excluding or varying general provisions, or dealing with special contingencies or circumstances not provided for; suspending any statutory enactments, by-laws, or regulations, &c.

(To be concluded.)

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* contains a fourth paper in the series on the Architectural Exhibition at the Brooklyn Museum, by Mr. Wm. H. Goodyear, M.A., in which he concludes his arguments on the asymmetries of Pisa Cathedral. We are given in this issue a number of photographic views of the architecture of old Mexico, of what is usually known in the States as the "mission period," that is, the sixteenth and early seventeenth century.

La Construction Moderne illustrates the grand stands of the race-course at Buenos Aires, of which M. Faure-Dujarric is the architect, and the central fire brigade station and municipal gymnasium at Saint-Owen, designed by M. Mancel.

Deutsche Bauzeitung gives a description and illustrations of the new government buildings in Karlsruhe, containing the offices of the Baden Grand-ducal archives, finance department and legal administration, of which the architects are Oberbaurat Adolf Hauser and Professor Friedrich Ratzel. We are also treated to some further illustrations and description of the details of the new Rathhaus at Rixdorf.

Moderne Bauformen devotes itself chiefly this month to the work of members of the Kiel branch of the Bund Deutscher Architekten, which has a distinctive character of its own in its version of the sober development of "new art" that is now, one might almost say, the national style of Germany in architecture. The work of the Kiel architects is supplemented by examples of that of Professor Alfred Grenander, of Berlin, and a few unconnected artists, amongst which is a coloured drawing of an interior by Mr. Edgar Wood, A.R.I.B.A.

Architekten und Baumeister Zeitung has another block of flats by Rudolf Erdos in the Neulinggasse, Vienna, illustrated by plans and elevation.

The *Architectural Record* has a good illustrated account of Buda-Pest, the most wonderful modern city of Europe, deliberately intended to surpass Paris and Vienna by her citizens and artists. In the series of articles on American colleges, Yale is dealt with this month.

The *Engineering Record* has an illustrated description of an example of a class of building that will probably be more frequent in the future than it is at present, a balloon house for the Signal Corps of the United States Army at Fort Omaha, Nebraska, a steel building, 84 feet by 200 feet and 81 feet high over all, intended to shelter a full-sized dirigible balloon. Two articles deal with attempts to reduce the cost of reinforced concrete building, the one by building the external walls of brick, the other by building with separately cast members instead of concrete moulded in situ.

COMPETITIONS.

Karachi.

THE competition for new municipal office at Karachi is one that ought to be left severely alone, even by the tyro who has just finished his articles. The cost of the building is to be 33,333*l.* 6*s.* 8*d.*, and what competitors are to fight for is the opportunity of making all the drawings for elevations and detailed plans, including "further details specified in the instructions to architects," for a premium of 500*l.* The Municipality are to "have all rights in the design, with power to erect the building under its own agency, either according to the design selected, or with such additions or alterations as it may deem necessary." That is, the author's design may be mutilated to any extent at the caprice of the Municipality.

Cwmgorse.

Another competition that should be ignored by every right-minded architect is the invitation to "tender" for plans, specification and quantities, for a chapel at Cwmgorse. This is nothing less than an insult to architects and architecture, which is thus placed on a level with the supply of coals, cheese and other everyday objects of commerce.

Doncaster.

A limited competition was recently held for a technical school to be erected on the site of the old Vicarage, Doncaster, at an estimated cost of 13,000*l.* The assessors appointed by the higher education committee were Messrs. Briggs & Wolstenholme, architects, Blackburn, and their report has now been adopted. Their award was as follows:—1, W. P. Schofield, Albion Street, Leeds; 2, Messrs. Russell & Cooper, Gray's Inn Square, London; 3, Mr. Morris Thompson, of Lytham.

Oswestry.

The designs of Messrs. Appleyard & Quiggin, architects, of Lord Street, Liverpool, have been accepted by the Salop higher education committee for a girls' secondary school at Oswestry. (Limited competition.)

London.

Mr. Alfred E. Wheeler has been awarded the "Saxon Snell" prize of 50*l.*, and the Royal Sanitary Institute bronze medal for his essay on the "Heating and Ventilation of Public Buildings," which was submitted in open competition under the terms of the "Saxon Snell" prize.

Workington.

The open competition for designs for the proposed new technical and secondary school which is about to be erected at Workington by the Cumberland County Education Committee closed on November 30, when forty-two sets of plans had been received from architects. The school is to accommodate about 300 pupils of both sexes. The assessor appointed to assist the sub-committee was Mr. Wood, of Messrs. Oliver Leeson & Wood, Newcastle. The award was as follows:—(1) Messrs. Clark & Moscrop, Darlington; (2) Messrs. Cheers & Smith, Blackburn; (3) Mr. D. A. Beveridge, Liverpool; (4) (bracketed) Mr. Henry Higginson, Carlisle, and Messrs. Kelvey & Pennington, St. Annes-on-Sea.

GENERAL.

Founders' Company.—This City Guild which existed as a Mistery prior to 1365, and has received three charters, the first of which was granted in 1614, announces an exhibition of foundry work in aluminium, bronze, gold, iron and silver, when British subjects residing in England engaged in foundry business or allied trades can compete. The competitions are for castings and models, as well as of designs, and it is open to founders, designers, craftsmen, apprentices and improvers. The prizes vary in value from 20*l.* to 2*l.* 10*s.*, together with the Company's certificate and silver and bronze medals. The freedom of the Company may be conferred in cases of special merit.

The South Wales Branch of the Guild of Architects' Assistants held the first of a series of meetings in Cardiff on December 17. The Cardiff, South Wales and Monmouthshire Society of Architects kindly lent their room for the purpose. A paper was read by Mr. S. Bowen Williams on "Llandaff Cathedral," and was followed by a very interesting discussion.

The Trustees of the Chapel of the Knights of the Thistle, Edinburgh, appointed by the King, held a meeting last week in Edinburgh. Various matters connected with the building and the internal arrangements and decoration were considered and disposed of. The trustees inspected designs prepared by Mr. R. S. Lorimer, A.R.S.A., the architect, and carried out in model for the roof of the chapel and ante-chapel, the stalls of the Knights, the stained-glass windows, heraldic bearings, and other details. These were generally approved of, and the architect instructed to have the work proceeded with, but certain matters connected with the stained-glass work were reserved for further consideration. It is desired that the chapel should be completed and ready for opening and consecration on St. Andrew's Day 1910.

The National Portrait Gallery Trustees have acquired by purchase a portrait of William Kent, 1684-1748, architect, sculptor, painter, and landscape gardener, signed by B. Dandridge, and a small portrait-group representing a musical party in Kew Palace, the performers being Frederick Lewis, Prince of Wales, and his sisters. The picture is signed and dated Ph. Mercier, 1733. Both works are now hung in the Hogarth Room—No. XI.

Mr. William Atkinson's death occurred at East Molesey on December 8, at the age of eighty-three. Mr. Atkinson was a member of the firm of Welch & Atkinson, surveyors, of 10 Lancaster Place, Strand, W.C., where he commenced practice more than half a century ago, and in partnership with Mr. Welch, who is still living, carried on an extensive practice. As quantity surveyors they were employed on many large public buildings, and Mr. Atkinson's long and honourable career terminated with the completion of the new War Office. The practice is still carried on by Mr. Stephenson in the same name. The funeral took place at Long Ditton on December 11 in the presence of a number of relations and friends.

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The Architect.

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FORTHCOMING EVENTS.

Monday, January 3.

Royal Institute of British Architects: General Meeting to consider the Revised Regulations for Architectural Competitions and other matters.

Wednesday, January 5.

Architectural Association: A Life Class opens under the direction of Professor E. Constable Alston.

Monday, January 10.

Liverpool Architectural Society: Paper on "Some Lessons from America," by Professor C. H. Reilly, M.A., A.R.I.B.A.

Surveyors' Institution: Paper on "The Housing and Town Planning Act, 1909," by Mr. John Willmott. The discussion will include that on the paper by Mr. Davidge read on November 22.

Wednesday, January 12.

Carpenters' Company: Lecture on "What is Artistic Craftsmanship?" by Professor Beresford Pite, F.R.I.B.A.

Northern Architectural Association: Paper by Mr. Frank W. Rich, F.R.I.B.A.

Architectural Association: Opening lecture of a course on "European Mediæval Architecture," by Mr. Edward S. Prior.

Manchester Society of Architects: Paper on "Concrete and Concrete Tests," by Mr. A. E. Corbett, A.R.I.B.A.

COPYRIGHT IN ARCHITECTURE.

THE British law is an almost hopeless confusion as to copyright in general, there being still in force a number of statutes which severally deal with parts only of the subject or are amendments to other statutes that so deal. Whilst this heterogeneous body of statute-made law has been growing to its present amorphous condition, various products of the brains of authors have been accorded more or less protection of copyright, but architecture has not up to the present been able to secure recognition nor architects to obtain protection.

Although the Fine Arts Copyright Act, 1862, gives copyright for the life of the author and seven years after in the case of a painting, drawing, or photograph made by a British subject or any person resident in the British dominions, this does not benefit architects in the ordinary way, for case-made law deprives the architect of any right of property in the drawings prepared for an employer, whether the building whose design is expressed on the drawings is erected or not. The Fine Arts Copyright Act also lays it down that on the first sale of any painting, drawing, or photograph the copyright shall belong to the purchaser or person for or on whose behalf a work is made for valuable consideration. Thus the architect not only has no copyright in his building, but except by special agreement has no copyright in the drawings made for the building.

As we noted last week, the Committee on the Law of Copyright, in their report to the President of the Board of Trade, have decided to recommend an alteration of the British law of copyright, which admits architecture to a position alongside of literature, music, the drama, painting and sculpture.

The reference to the Committee was:—"To examine the various points in which the revised International Copyright Convention signed at Berlin on November 13, 1908, is not in accordance with the law of the United Kingdom, including those points which are expressly left to the internal legislation of each country, and to consider in each case whether that law should be altered so as to enable His Majesty's Government to give effect to the Revised Convention."

This Revised Convention modified the basis of international copyright as agreed in the Berne Convention of September 9, 1886, and the Additional Act of Paris and Interpretative Declaration of May 4, 1896. In the Berne Convention, plans, sketches, and plastic works relating to architecture were protected; now international copyright is to be extended to "works" of architecture.

It is thus internationally recognised that an architect's production is a building, not a drawing by which he conveys to others an idea of a building; the drawing is but a means to an end, a tool for the formation of a "work"; the "work" is the building. This is quite a new conception of architecture and architects' work to many of the British public, and especially to the legal portion of the public, who have persistently looked upon an architect as a man who makes a drawing, or "plan," as it is generally described in the law courts, whether it be truly a plan or an elevation or a section or a perspective. The legal view has been that the architect is the man who makes the "plans," and when he has made them, and been paid, he has been paid for making the "plans," and so must hand them over to his employer, with the copyright attaching to them.

The present Committee has been led to form a different opinion to that of the Royal Commissioners of 1878, who considered that it would not be practicable to give the protection now suggested to architects, and the Committee has been influenced to their decision by the evidence that has been brought before them to show that no difficulty in affording this protection has been found in other countries.

When, as will probably be the case, the report of the Committee comes to be embodied in a Bill for the modification and codification of the British law of copyright, this Bill will require very careful watching on behalf of architecture and architects, for it is evident that even on the Committee, who have taken so broad-minded view, there are doubts. Mr. W. JOYNSON-HICKS, M.P., Mr. T. E. SCRUTTON, K.C., and Mr. E. TREVOR LL. WILLIAMS, members of the Committee, are all opposed to the inclusion of works of architecture as proper subject matter for copyright, whilst the report itself suggests that there may be difficulties of proof of infringement and difficulties as to remedies.

We do not see that there would be any great difficulty with regard to remedies. The report suggests that "penalties might be awarded against anyone who copies or is a party to copying," and precludes the idea that it should be necessary for the architect whose building is piratically copied to prove damage in a technical legal sense, or that remedy should be given by the destruction of the building which is a copy. There cannot, we think, be any difficulty in arranging a scale of penalties, which might be based either as a recompense to the original author or as a deterrent to piratical copyism. In some of the older copyright Acts there was a provision that an author whose work was copied might sue for damages and double costs, and herein lies, we think, a suggestion. Suppose an architect has designed an original building for which he has received, let us say, a fee or payment of a thousand guineas, and that this building has been copied. If the infringement, on proof, were followed by

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a penalty of twice one thousand guineas, half to go to the author of the original design and half to the owner of the building, both the injured parties, the architect and the client, would be recompensed, and the penalty would be in the nature of a deterrent.

The difficulty of proof of infringement is, in our opinion, more imaginary than real. It has not prevented successful actions in other countries of the Union, and it ought not, therefore, to be insuperable in Great Britain.

Copying of architectural design manifests itself in two directions, first, in the copying of the arrangements of plan, using the word "plan" in the architectural and not the legal sense; second, in the copying of architectural features either singly or in combination. Now there is not the slightest difficulty, given a knowledge of the past, in determining whether a plan is new and original or whether it incorporates arrangements that have been previously used. To take the case of moderately sized houses, the non-professional public might think it almost impossible to make a new plan, but a properly explained visit to a garden city, or to the work of any one of scores of our modern domestic architects, would show that not only have new and original plans been produced, but new types of plan have been evolved in the twentieth century. The general public, in fact, have no idea of the amount of original thought that is put into plans, not only by our leading architects, but by hundreds of the rank and file.

Then, with respect to architectural features, it needs but a sound knowledge of the history of the past to determine whether, let us say, a gable is of a form that has been used before or is something that is quite original. Whether the originality is allied with beauty is another matter, but this does not come within the domain of copyright. To a certain extent it is true that modern architectural design is frequently, we might even say usually, based upon that of old work, and no copyright could attach to the use of a recognised "order"; but there is on the continent of Europe plenty of modern architectural detail that one might almost say is like nothing else that ever was, on land or sea. It is not necessarily beautiful, but it is original, and so good matter for copyright.

The only part of architectural design in which we anticipate any difficulty of proof of infringement is composition. Assuming that the details of features used by an architect are not original in design, is he entitled to copyright for any particular arrangement or composition of those features? If someone else uses a similar composition with different detail, original or not, is this an infringement? The difficulty in this respect would probably disappear in most cases by reason of the close connection between composition and plan.

In any Bill dealing with copyright in architecture, it is important that provision shall be made for the infringement of the copyright of an unexecuted design by an unauthorised erection of a building. At present, as far as we, not being lawyers, can understand, a copyrighted drawing may not, under the Revised Convention, be copied by a drawing, nor a building by a building; but we think it is open to an English court of law to decide that a building cannot be an infringement of the copyright of a drawing which has not materialised into a building.

We think it is a matter of congratulation that it is now internationally recognised that the product of an architect's brain is a building, and that he is as much entitled to protection as any other man who produces a work by the activity of his brain.

Of one thing, important above all, we are sure—that the extension of copyright to works of architecture will be beneficial to the art of Architecture. There will be more originality when originality is protected. There will be a greater striving after beauty in originality, because it will be recognised that without beauty the copyright of originality is of very little value. If copyright adds to the sum of both beauty and originality in modern architecture, the Revised Convention will have done a great work for Art.

And when we in Great Britain obtain the benefit of copyright for works of architecture, let us not forget that for it we have to thank very largely Mr. John Belcher, R.A., Mr. John W. Simpson, and the support they have received from M. Georges Maillard, President of the International Literary and Artistic Association.

NOTES AND COMMENTS.

The gratitude of all lovers of art is due to the memory of the late Mr. George Salting for the bequest of his marvellous art collections to the nation. It may be said by cavillers that Mr. Salting was one of those to whom the pleasure of collecting is everything, and that as he could not take them with him it mattered little to him what became of his collections after he had passed to the great beyond. But we are disposed to think otherwise and to believe that, although he did no doubt enjoy to the full the keen pleasure of the collector in acquisition, he had for long regarded himself as one of the nation's champions in the enrichment of the country with valuable works of art. We know that he had expressed to his friends the intention of bequeathing his treasures to the nation, and there can be little doubt that when he "lent" to the Victoria and Albert Museum it was with the full intention that the repayment of the loan would never be required. The sections of Mr. Salting's collection which most interest ourselves are the woodwork and metalwork in the Victoria and Albert Museum, which embrace many examples that are most valuable to a student of architecture, even such as are not actually, perhaps, part of buildings. In view of the great benefits conferred by the testator on the nation we make little of the fact that by the terms of his will the system of classification by material which now obtains at South Kensington will be somewhat dislocated.

London's promised new bridge will be the more worthy of the capital of the Empire and of the Corporation of the City of London if heed be taken to the lessons taught by the lecture on "The Architectural Element in Steel Structures" lately read by Mr. Robert Boyle, B.Sc., before the Architectural Section of the Royal Philosophical Society of Glasgow. The lecturer pointed out the great superiority in architectural character of modern bridges on the Continent as compared with those in Great Britain, and attributed this superiority to the collaboration of architects and sculptors with engineers. This collaboration is quite a different thing to the system of bridge-designing by an engineer with an architectural assistant to cover up the steelwork and draw the mouldings. With all respect to the Corporation we do not want another Tower Bridge to become the laughing stock of every French, German, Austrian, or Belgian artist who comes to view it.

We noted a short time ago the proposition of the new policy proposed to be followed by the George Heriot's Trust in Edinburgh, and at a meeting of the Governors held on the 13th inst. the matter was considered, when Treasurer Leishman moved:—"That in all future feus and sales of ground belonging to the Heriot Trust the conditions should embody that streets on such ground should not be less than 100 feet in width from building line to building line, with a minimum width of carriage and foot way of 80 feet, and that there should be the same amount of unbuilt-on ground at back of houses as at front; further, that no greater height of houses than three storeys be permitted on trust ground; and that in addition for every 10 acres feued there should be left in each particular district at least one acre for public ground, to be used as a recreation ground for public use. It is further resolved that no greater price be exacted for ground for working-class tenements than for villas. It is in addition resolved that conditions of feu or sale should embody restrictions against sub-dividing houses and creating ground annuals."

The Treasurer, in the course of his remarks, urged that wide streets made for the public health and the well-being of the inhabitants, and it limited the number of people that could be placed on a particular piece of

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ground, and that was his reason for putting down a minimum width of 100 feet. It was not a revolutionary proposal. It was a fair average requirement in a large city, and it was simply going back to the policy of their wise predecessors. Speaking of overcrowding, he said that the Heriot Trust and other trusts had been responsible for a great deal that was evil in the city. It had not been their intention, but that had been the result. They could not have crowded streets and crowded thoroughfares without creating manifold evils. Finally, it was resolved that the matter be referred to a committee for consideration and report.

A STRIKING comment on our own starved and neglected canal system is the American scheme for a deep waterway from Lake Michigan to the Gulf of Mexico. If it is worth while in the Middle West of the United States with its 86,000 miles of railroad track to supplement this by a fine waterway at an enormous outlay, our inland trade is surely being crippled by the want of any such facilities. Of course the trouble here is that the railway companies have obtained financial control of a very large proportion of our canal system, and have deliberately assisted in its impoverishment and disuse. We question whether the policy is a sound one even from the railway companies' point of view. There is plenty of traffic that is not in a violent hurry and that would move long distances if rates were cheaper. Particularly does this apply to building material, and we believe that a revived and improved system of water carriage would pay the railway companies excellently well.

THE final Report of the Royal Commission on Canals and Inland Navigation has now been issued, and the majority of the Commissioners are in favour of State-aid to the development of a reorganised canal system in Great Britain. The minority voice the interests of the railway companies. To architecture a cheap means of transport for bulky material is of high importance. It frequently happens that an architect cannot use the particular kind of stone or brick that he desires in his building because the cost of carriage is prohibitive.

How to build without a contractor is a problem the solution of which has been frequently attempted, and sometimes by eminent architects, but the result is usually unsatisfactory. At Loughton, Staffordshire, some ladies attempted the solution, controlling everything, buying the material themselves, selecting the workmen themselves, and so interfering with the assistance they might have received from the foreman they engaged. The result was an excessive cost of the houses that were built, followed by a lawsuit on a claim by the quasi-foreman, whom the judge found had charged too much.

THE Romans seem to have a tartar in the Syndic of the Municipality, Signor NATHAN, who defies the Higher Council of the Fine Arts and their veto on the proposed union of the three palaces on the Capitol, a spoliation of MICHEL ANGELO'S design. Another matter in which the Syndic sets himself up in opposition to the judgment of all in the city who have any claim to an authoritative opinion on matters artistic, archæological, and architectural is the municipality's scheme for dealing with the Piazza Colonna. Signor NATHAN seems to voice the attitude, whether willingly or unwillingly, of the Socialist power in the municipality. Socialism and Art do not pull together.

COMPETITION FOR NEW PREMISES OF THE LEEDS INDUSTRIAL CO-OPERATIVE SOCIETY, LTD.

THE conditions of this competition appear to be satisfactory as things go. An assessor has been appointed, Mr. F. E. L. HARRIS, A.R.I.B.A., of Manchester, architect to the Co-operative Wholesale Society, Ltd., and he is to "advise and assist the directors in arriving at a decision." Although the directors do not bind themselves to carry out any design, "it is their intention to appoint as architect for the work the author of the first premiated design." The architect appointed to carry out the work is to be paid at the rate of 5 per cent., but this is to include travelling and other expenses. For quantities an additional 1½ per cent. is to be paid to the architect or a quantity surveyor, but this is to include lithography.

The site is somewhat irregular in outline, and about 160 feet long by about 100 feet deep, with frontages to both Albion Street, 43 feet wide, and Bank Street, 25 feet wide. At the ends it is practically hemmed in completely by adjoining buildings.

Accommodation is required for furnishing, boot, drug, and confectionery departments, and for numerous offices, board-room, committee-rooms, &c., and competitors may take it that the planning will be found no easy matter. Plans of each floor and elevation to Bank Street are provided, indicating approximate position of departments and other accommodation, old walls, &c.

The elevation to Albion Street must be of stone to correspond with the Society's adjoining premises, which, by the way, are to be connected to the new on various floors. It is not quite clear from this whether the design of the present premises is to be followed, but this is not quite what would be accepted nowadays as remarkably beautiful.

The drawings required are plans of each floor, front and back elevations, one longitudinal and two cross-sections, to one-eighth scale. No perspective. The drawings are to be sent in not later than March 1, 1910, which, in our opinion, is not sufficient time for any architect who has anything else to do.

ARCHITECTURE: ITS TRUE PRINCIPLES.—XXIV.

By R. OWEN ALLSOP.

PRINCIPLE *v.* TRADITION.

TOO ardent pursuit of fundamental principles is to be decried, whether in science or art. By persistence the mind bereft of its grasp on finite, comprehensible things becomes lost in the incomprehensible infinite. He is wise who, perceiving that the subject of his inquiry is assuming a penumbral aspect, retraces his steps. Persistence has but one ending. Mental obscuration supervenes, and finally the philosopher will declare that to be unknowable which he quite well comprehended as a child upon his mother's knee.

Thus to the plain man space is infinite. There is no need for perplexity on the point. But, as when the frog destroyed himself in his endeavour to rival the bull, so even great minds have been virtually wrecked in efforts to fathom infinite things. The space-cramper, with his fourth dimension, must be allocated to the same class as earth-flatteners. It must be adjudged to be the sign of a healthy mind to vomit out unwholesome mental food. To endeavour to assimilate such, even if not permanently straining the power of right reasoning, institutes stresses that bring about a state of mental fog with inability to draw conclusions from facts plain enough to the plain man.

All inquiries into the absolute genesis of created things, states, conditions and causes, present this danger. As a result hypotheses are founded on false premises, and a whole fabric of theory raised, only to come tumbling down on the discovery of some new, unquestionable verity. For this reason the student of architecture will do well to avoid all kind of root principle study unless aware of the limitations of human understanding. He will be well advised to remain a humble copier of that which is universally pronounced sound and excellent, and look upon old work with the same eye that the artist regards nature. Principles of style are to such safer subjects of study; and whether these or fundamental principles, based on considerations psychological, all in architecture are plainly rounded in by practical principles of building—the laws of equilibrium and stability. It is so very easy for speculative minds to be led astray in formulating novel theories as to causes and origination,

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as, for example, the beautiful in architecture. Certain postulates are made, certain things and facts seem to harmonise, and the whole becomes a variety of fetish, the outlook being warped until correct judgment on the question involved becomes impossible. The legitimate range of study of prime causes and of genesis must therefore lie well within that boundary where facts are glimpsed but cannot be held, and where ever the horizon retreats before us.

There is another reason for caution in this matter; it is impossible by word or sign to convey sensations and sympathies. We cannot write down in characters the scent of lily or rose. As a practical outcome each one must study and think for himself. The artist and the musician would be quite glad to convey directly and speedily his knowledge and attainments, but that he is unable so to do, the acquired skill of eye and hand not being communicable by words, there being no medium or common plane whereby he can convey that which he would. Again, all knowledge as such is secondary to practice—experience and dexterity gained by constant repetition of acts. It is therefore a great delusion to



FIG. 47.—ST. CLEMENT DANES.

imagine that any kind of discovery, principle, or theorem can furnish a royal road to any human accomplishment—art or science.

The most desirable result of thinking about principle is that it should create an impression that we must needs study and work yet more arduously. The great value of an inquiry into principles is that it instils a desire to reason as distinct from being content to imitate. As matters now stand, each and all may usefully essay—give thoughts and views—on first principles; but none can justly lay down and dogmatise. The real first principles in æsthetics are hard to discern, and are at best perhaps merely glimpsed at times of "good seeing," as the astronomers have it. In place of true fundamentals we conceive any number of secondary or tertiary sub-principles, and unless bounds are set most thinkers could continue to discourse without any very definite conclusions on a group of rules that ramify and sub-divide without apparent end.

All great laws of conduct are mainly negations—"*thou shalt not.*" They are laid down to the end that the right state may be preserved by avoidance of fatal wrong-doing. It is in petty affairs we find such formula as "he shall cause to be constructed." The great rule that main forms of building shall not—according to Western ideas—be broken up like confectionery, in no way applies to, or cramps the hand in, small matters of detail, where fancy is free to roam. There is no sort of compulsion on the artist excepting such as prevents a kind of æsthetic suicide. The possession of a compass does not alone insure the safe voyaging of the mariner. It indicates certain things that prevent his navigating to his destruction, but in no way lessens the arduous labours entailed in crossing the ocean. The knowledge of any amount of right principles cannot alone make that which we like to understand by the term architect, any more than acquaintance with the rules of grammar can make a great author, or familiarity with laws of harmony a great musical composer. Nevertheless, every sound principle is a safeguard against error. In many, if not all, walks of life, it is first essential to avoid wrong-doing; hence the main aim of principles is negative. Such considerations as these should make unnecessary and meaningless that antipathy to first principles so often evidenced by those who appeared to be obsessed with an idea that writers on such will somewhere seek to lay down dogmatic rules and regulations as to the design of this and that feature. Attempts have been made in this way, but every true artist sees the vanity of the method and the reason of this vanity, and pursues his way unperturbed.

Mere rules of negation do not suffice to bring forth active design, and if all laws are in the main *shall nots*, it seems difficult to understand how one may design novelties on principle. Possibly we never do, and do not in the strict sense require so to do. The use of the term "novelty" is misleading, and what we so often term novelty in architecture, and that which so many rightly condemn, is rather the result of the ignoring of all fundamental rule. The elemental parts of architecture should, we cannot but think, be regarded as unchanging and unchangeable. The author uses again and again old set phrases, time-old words, and always the same alphabet. What is required is rather the new grouping of old entities. Let anyone sit down with the avowed object of designing a new "order." He will do one of two things—either produce something which he will find anticipated in the next street the first time he goes out, or something so monstrously offensive to his own eye that he will for ever after forswear novelty and gladly in future adhere closely to traditional forms. Plainly the designer had been engaged on a futile labour; in the one case he had by chance or by skill produced something he at the time considered novel, and in the other set all the canons of art at defiance to secure a monstrosity on the plea of novelty, which variety of the novel no one requires. He may reason from this experience that old columns and entablatures must be regarded as set phrases, unimprovable as a whole, amenable to detail modification, anything like them on the score of æsthetic importance requiring centuries of time and countless brains to evolve. Possibly now and again some master-stroke is made, mostly as an improvement on what preceded, or as a simplification, as when someone cut off the foliations below the Roman Ionic and left us a supremely simple and beautiful capital.

It will be observed in the most admired work of modern architects that spurious and forced "novelty" is conspicuous by its absence. Such designers employ the old symbols and old phrases with novel arrangement, while all detail is marked by a peculiar combination of

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power (forcefulness) and refinement. The parts are not weak, slavish copies, the work of a completely dominated and semi-paralysed—in a mental sense—worker. The old basic theme perhaps remains. There is the old word or unimprovable phrase, but they have passed through a milling process—the sensitive and active brain—and have emerged (as it may be put) *the same, but different*. The actual difference is perhaps (as it were) a hairbreadth—the turn of a line here, a mere moral impression, so to speak, of the difference between slave and master. The practical result is that the old form suits its new position. It pleases us, not by its so-called novelty, but by the thought instilled, the refinement and the power. It is as though a time-honoured phrase best expressing a certain meaning had been carefully weighed and adjusted to a slightly modified import, perhaps by mere accent, without even new sequence.

The distinction between this variety of design and that of the novelty-seeker is one of patient thought and its application to definite end. In the one case great study and care were concentrated to produce a beautiful object; in the other we get something requiring little thought and supposed to be novel and entertaining by its novelty. To compare the two productions, one is a beautiful thought beautifully expressed—clothed in suitable language; the other mere unintelligible babbling—gibberish. It is at once apparent that to express a thought one must employ intelligible language, and that the more universal the language, the more widely understood; obviously, again, the wider the knowledge of such language the richer and more varied the power of expression. No mere study of erudite principle will extend our knowledge of architectural vernacular or of that which is on a broader footing. The basic signs and the flowery periods must be gathered from the book written in stone, marble and brick; and of the two ways, great principle and little study and little principle and great study, the latter is by far the best and surest foundation upon which to base interesting architectural design. To the earnest and enthusiastic student much study of approved old work necessarily means the gradual, if insensible, acquirement of the principles or grammar of architectural composition.

THE END.

THE ARCHITECTURAL EXHIBITION AT BROOKLYN.

By WM. H. GOODYEAR.

THE relation of architectural history to the general history of art is that of indispensable forerunner and guide to a general knowledge of the subject. Just as a general knowledge of the sequence of geologic periods is a necessary basis and foundation for all studies of evolution in natural history, so also, in the history of art, a knowledge of its periods, of their divisions and sequence, is involved in the very conception of such a study. Now it so happens that the broad divisions of these periods can only be definitely indicated by the historic architectural styles. For example, the essential unity of modern history and of modern art can only be definitely marked out and limited for the art historian by the contemporary use of the Renaissance architectural forms. In like manner the limits of mediæval art, its beginning, its end, its evolution, and even the terms by which its periods are specified, are only to be understood and known after its cathedrals and churches have first been studied.

It is, however, less than a century since this study was formulated, even in its incipient stages. The mediæval monuments are separated from our own time and, above all, from our own interests and modes of thought, by a period of four hundred years.

Moreover, the so-called Gothic of our own time and the other so-called "mediæval styles" in modern use, were unknown before the date of these modern studies. The modern mediæval "styles" are therefore literary, or (so to speak) studio, revivals, inspired by the literary studies of the Middle Ages which first called attention to the subject.

Thus the general study of mediæval architecture may be considered as having importance from three different points of view.

First, it is an indispensable connecting link between the general history of ancient classic art and of modern art. To a general view and knowledge of art history the study of mediæval architecture is therefore essential. In the second place, the study of mediæval painting, sculpture, and decorative art demands a knowledge of terms, facts and sub-divisions of period, which are connected with the sequence of the mediæval architectural styles. In the third place, it is desirable that every competent art critic should be able to judge and criticise or appreciate the modern revivals of the mediæval architectural styles. This is manifestly only to be done after a thorough knowledge of the old buildings, which have been copied, has been attained.

To these considerations, which illustrate the importance and interest of mediæval architecture, may be added the great and notable general interest of the mediæval cathedrals to all cultivated people who have travelled or who intend, or hope, to travel.

That it is one of the missions of an art museum to illustrate and assist the study of the mediæval cathedrals cannot be debated in the negative. An exhibition of architectural casts must, however, always be inadequate to such an end. Architectural casts must be necessarily confined, on account of their large dimensions, to architectural details, and these are of interest, in the first place, to specialists and to architects rather than the general public, for we must know the whole before we can appreciate or value the part. Models are too expensive to be available in even remotely adequate numbers. Thus the enlarged and framed photograph, publicly exhibited, is the obvious recourse. Everything is in its favour. Nothing can be said against it. From this point of view the Brooklyn Museum has made a special feature of architectural photographs enlarged for public exhibition. These have been necessarily made from its own negatives taken in Europe and for this purpose. Its collection has achieved the distinction of having been represented by two separate exhibitions of very substantial dimensions in foreign countries. In fact, the catalogue now in use in Brooklyn was written for an exhibition in Edinburgh, and the dimensions of that exhibition, as far as linear extension of wall space are concerned, were as large as the larger exhibition hall in the eastern wing of the Brooklyn Museum, in which a large portion of the Brooklyn exhibit is now installed.

There are two methods of approaching the study of mediæval architecture. One is to treat it by periods and to illustrate its evolution by typical examples. This method has not, so far, been attempted in the Brooklyn Museum, although it is highly desirable that it should be. The other method is to illustrate the artistic virtues of all periods and to explain the philosophy of this excellence. This later purpose is that of the present architectural installation, for the development of the critical or appreciative faculty demands the aid of contrast, and to judge our own buildings of mediæval style (so-called) we must study the originals.

In this study we find that the first and main difference between new and old is that the modern building is, mathematically speaking, regular, and that the old building is, mathematically speaking, irregular. This irregularity, when obvious, has been generally realised as an element of beauty and as a feature of the picturesque quality which is the greatest charm of the old cathedrals. Such irregularity has, however, been viewed as "accidental." It is true that obvious irregularity was generally an accident in some senses, but an accident that can be easily avoided is hardly an accident in the strictest sense. The point of view that irregularity was not avoided as a defect appears to be more important, and is not inconsistent with the point of view that irregularity was frequently preferred, and this appears to have also been the case.

That irregularities which are not obvious are numerous has not, however, been widely known. Not easily distinguished by the eye, they may, however, be detected and shown by photography under circumstances which demonstrate constructive intention. In other cases this demonstration is found in surveys which show the correspondence of measures as to variations which are asymmetric by pairs in regular sequences of gradation, or which correspond on different sides of a building. In this sense the museum photographs and surveys are interesting and novel contributions to our knowledge of the mediæval churches.

The distinctive feature of the Brooklyn architectural exhibition is its attention to the illustration of such instances of intentional departure from geometrical symmetry in mediæval architecture. The catalogue classifies and records the nature of these departures, and therefore we will not

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specify them here, preferring (as an indication of the importance of this branch of the study) to quote the names of high authorities who have mentioned the existence of intentional asymmetry in the mediæval cathedrals, or who have given their direct countenance and approbation to the Brooklyn Museum exhibition.

The philosophy of the picturesque quality in mediæval church architecture has, for instance, been eloquently described and analysed by Mr. John Ruskin in the "Seven Lamps of Architecture," and notably in that chapter which is called "The Lamp of Life."

Mr. Ruskin was apparently the first to point out by implication, if not by direct assertion, that the mechanical formalism of modern architecture is a defect, and that the virtue of spontaneous life is the most admirable quality of the mediæval work. For Greek temple architecture the same facts had been previously realised and shown by others, but Mr. Ruskin drew no parallels in this regard, although he might easily have done so.

His point of view is admirably summed up in a passage which follows here. He speaks of "accidental carelessness of measurement, or of execution, being mingled undistinguishably with the purposed departures from symmetrical regularity, and the luxuriousness of perpetually variable fancy. . . . How great, how frequent they are, and how brightly the severity of architectural law is relieved by their grace and suddenness, has not, I think, been enough observed; still less, the unequal measurements of even important features professing to be absolutely symmetrical." There is, perhaps, one improvement to be made in the wording of this passage by the insertion of the word "often," as follows:—"Accidental carelessness of measurement . . . being *often* mingled undistinguishably with the purposed departures," &c.

If the passage were not so understood it would have been illogical in Mr. Ruskin to have proceeded to prove, as he does, that purposed departures from symmetrical regularity can be specified and distinguished in great numbers.

Thus he says, after some pages of instances:—"I imagine I have given instances enough, though I could multiply them indefinitely, to prove that these variations are not mere blunders, nor carelessness, but the result of a fixed scorn, if not dislike, of accuracy in measurements, and in most cases, I believe, of a determined resolution to work out an effective symmetry by variations as subtle as those of nature."

Mr. Ruskin's occasionally erratic and frequently erroneous views on other subjects in art criticism have somewhat obscured the great importance of his contribution to architectural criticism in the "Lamp of Life." Another great man has, however, expressed himself in no uncertain way, and to the same effect, on the same subject, and this authority is the greatest of our time for historic buildings.

M. Auguste Choisy, whose lamented death occurred in September of this year, is the author of a history of architecture which has no rival in precision of expression, in compactness of form, or in the treatment of structural problems. It has no superior in the domain of the history of architecture, whether the book be considered as a chronologic summary, as a territorial guide, or as a matter of fact compendium.

M. Choisy's standing as an engineer is sufficiently attested by his appointment as chief of the French Department of Roads and Bridges (*Ponts et Chaussées*). In this capacity he had made surveys for a French Government railway in the Sahara Desert. His great distinction was to combine and balance in equal perfection the capacities of the engineering expert and of the critical art historian. Hence his utterances as to constructive asymmetries in mediæval architecture may be regarded as decisive. These are the words of his "History of Architecture," after mentioning certain instances of mediæval optical illusions:—"These irregularities are visibly intentional. There are others which must be charged to the account of builder's errors. The distinction between the two is sometimes difficult; but if we consider the original and almost subtle spirit of the Gothic architects we shall be convinced that there was calculation more often than negligence in their work." Another passage says:—"In general, the mediæval architects avoided formal regularity. If they admitted an element of symmetry, as regards the whole, they knew how to break the monotony by an infinite diversity in details." After mentioning that the façade of Notre Dame at Paris has three portals, which were built at the same time and which are all of different forms, he continues:—"These variations give a charming variety to the composition. Our sympathy is awakened by these works in which the author has disdained the too facile use of a repeated pattern, in which each part has been accorded a separate study and an individual attention. Instead of symmetry there is balance, and the unity of impression does not suffer by it."

M. Choisy's interest in the Brooklyn Museum architectural exhibits was frequently and warmly expressed in a multitude of personal letters. One of these was received only about ten days before his unexpected and sudden death. It is of great interest that he should have so often and so frankly insisted on the novelty of the facts which had been brought to his attention by these photographs. This he did, not only as a friend and personal correspondent, but also in an official and public manner. In a session of the Académie des Inscriptions et Belles-Lettres, at which he exhibited some of the enlargements, in August 1905, M. Choisy publicly expressed himself to the effect that "it is to be wished that at least a portion of this precious collection could form a part of our museum collections in France." His latest letter contains the following passage:—"You have opened up a path which it will be sometimes difficult to follow, but which will certainly be fertile in unexpected results and in the rectification of errors which have been too widely accredited. You are already reaping the fruit of the lessons which you have given to other observers. Before you, people were satisfied with plans of factitious regularity. In future these conventional plans will no longer be in vogue, and it will be necessary to publish the real anomalies and their true plan."

A letter received from M. Choisy in December 1907 contains the following passage:—"I have read with lively interest your contribution to the *Journal R.I.B.A.* You should be congratulated on the incident which called for this article, for it has given you an opportunity to unite in one résume all the essential features of your numerous memoirs. One is really thrown into consternation by the extent of your researches; how many monuments we thought to be regular which you have shown to be otherwise, although even the practised eye does not discern it. As for the reason why so many curious facts should have been ignored, you explain it in penetrating fashion by the effects of contrast and, as regards the piers, by the effects of perspective, which cause the lines to converge in the raising direction and thus diminish the effect of the actual widening. . . . In a word, you have inaugurated a method which, in your hands, has revealed a whole world of facts."

The current issues of the *American Architect* will supplement these brief hints as to the significance of the Brooklyn Museum Architectural Exhibition. The articles already published on this subject are of date August 4, September 8, and October 27. Three other articles will follow at short intervals.

The following statistics may be of interest. The number of negatives taken in Europe is about 1,500. The number of framed exhibits is 632. The amount of linear wall space covered by these exhibits, counting each line of hanging, is about 2,000 feet. Among the cathedrals most thoroughly photographed are the following:—The Cathedral of Amiens is represented by 133 enlargements, Notre Dame at Paris has fifty-nine enlargements, Rheims Cathedral has twenty enlargements, the Pisa Cathedral has forty-three enlargements, and St. Mark's at Venice has forty-two enlargements. From the mere mention of these figures it may be gathered that such an exhibition of all the various individual features of certain celebrated cathedrals, taken in detail and at close range, has never hitherto been attempted.

WASHABLE DISTEMPER.*

THE title "Washable Distemper," said Mr. Cruickshank-Smith, in opening the discussion, seems to me to imply an inherent contradiction of terms, but it has, no doubt, been adopted in the present case by the executive of this Society for good and sufficient reasons, which will probably be disclosed in the course of the debate. May I be allowed to clear the ground as regards the question of nomenclature before proceeding further? Each one of the great group of materials which will come under our purview to-night contains water as an essential component part. Hence, if we require a generic name for the whole class, "Water Paint" might be suggested. Sub-dividing this genus on a basis of the pigmentary constituents we might

* A discussion on "The Advantages and Disadvantages of Washable Distemper," held at a meeting of the Paint and Varnish Society, on December 9.

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classify, on the one hand, those materials the pigment in which is essentially a lime compound—either the hydrate, the carbonate, or the sulphate—and, on the other hand, those in which the pigment consists essentially of a zinc pigment. To the first group the descriptive term "distemper" properly belongs, while to the second group the distinctive description "tempera paint" appears to be appropriate. It is to the latter group—that of the true tempera paints—that I propose to confine my remarks. Britain may justly be said to be the modern home of these materials. In no other part of the world has their production or consumption reached such huge totals as has been the case here. I estimate that not less than 10,000 tons of tempera paint in paste form are produced annually in Britain, and this figure is probably short of the actual output. It is not easy to estimate such figures with perfect accuracy, but I have reason to believe that there is used in Britain annually at least 100,000*l.* worth of the best makes of tempera paint, and of this enormous quantity a large proportion is sold direct to painters and decorators. We are, therefore, dealing with no negligible item in the annual purchases of paint materials in this country, and anyone who attempts to belittle the importance of this branch of the paint industry, or to suggest that the figures I have quoted are not due to some solid and tangible advantages possessed by tempera paints as a class, is surely either grievously misinformed or woefully blind to facts. Let us now get to the kernel of our subject, and briefly discuss the advantages and disadvantages respectively, or may I not rather say the merits and defects, of tempera paints? In such matters, as in most others, the point of view counts for much, and I shall, therefore, attempt to sum up the case as fairly as I can; first, from the artistic; secondly, from the economic; thirdly, from the hygienic and public health; and, fourthly, from the practical painter's point of view.

When we step into the realms of art we are at once outside the region of definite law, and are subject more or less to personal ideals and individual tastes. Whether the vogue in tempera paints has moulded or has been moulded by the general trend of public taste during the last ten years it is not for me to say. This much, however, is obvious, that the increase in the use of tempera paints has been contemporaneous with a marked advance in the taste of the public for plain coloured surface and for matt effects in decoration. Not unconnected with this is the more recent and still growing taste of a large section of the public for what is generally described as period decoration. It is claimed, and I think with justice, that in the hands of a capable craftsman a true tempera paint provides an unequalled medium for the carrying out of decorative schemes of this nature, the infinite variety of tone which can be obtained and the unique colour effects which are capable of being produced being well nigh unattainable by any other means. In the highest class of decorative painting the texture of the surface and the "quality" of the colour effect are of the highest importance, and I venture to submit that the ideal tempera paint is facile princeps as a material whereby the most beautiful effects can be secured on mural surfaces, effects which far surpass those presented by that coldest and most unsympathetic of all backgrounds, the oil-painted wall. Not every water or tempera paint can be successfully used for the purposes I have indicated. Several that I am familiar with, and some of them more than others, possess defects. Perhaps the commonest, and certainly one of the most irritating to the decorator, is their proneness to "rub up" when succeeding coats of the same colour are applied, and this is especially liable to occur with dark colours in which, of course, the proportion of staining material is greatest. There are, no doubt, gentlemen present who will tell us how this defect can be remedied. In this, as in nearly every department of the paint trade, a clear appreciation by the manufacturer of the requirements of the painter tends to dissipate misunderstanding and to promote harmonious co-operation between maker and user.

The relative merits of tempera paints and of wall-papers and other forms of mural decoration fall to be discussed in this connection, and some interesting expressions of opinion on this aspect of the subject may be looked for.

Now we come to the second point, the prosaic but inevitable one of pounds, shillings, and pence. Every year the master painters of the country are wont to congregate in solemn conclave and in an atmosphere of considerable dignity and comfort to discuss "the decadence of painting," to read papers on "Art for Art's Sake," and to laud the noble calling to which they belong. They then repair to their several places of abode and proceed to cut each other's throats by tendering for a painting job at prices ranging from 350*l.* to 150*l.* for the same piece of work. Tempera paints have been a welcome addition to the repertoire of the framer of the low-priced tender. He uses them instead of patent knotting, he primes his new woodwork with them, he undercoats his enamel with them, and he does a hundred and one other things with them which the devotee of white lead, oil and turps would stand aghast at, and the curious part of it is that (provided he is not unreasonably hampered by his specification) he can as a rule, if he knows his business, turn out work which, if we consider the price he is paid for it, is creditable and satisfactory. At any rate such methods are in the opinion of many people better than those which involve the use of knotting at 4*s.* 6*d.* per gallon, reduced white lead at 16*s.* per cwt., and the mixing of boiled oil with copal oak varnish. It is one of the greatest mistakes to imagine that because a paint material is cheap, therefore the cost of handling it will also be low. Contrariwise, a properly manufactured, and therefore a fairly high-priced, tempera paint should not be set down as a material the handling of which involves a cost proportional to its price. The experience of large users of tempera paint is totally opposed to this view. I believe it is generally allowed that, coat for coat, a highly finished tempera paint costs to apply (including the cost of materials) about 33⅓ per cent. more than size distemper, and about 25 per cent. less than oil paint. The economic side of the question is very interesting, and no doubt we shall hear valuable expressions of opinion in the course of the general debate.

It is interesting in connection with the economic aspect of the question to observe the attitude of those who, in the capacity of architects, engineers, and owners of property, regard the question of paint materials from the point of view of their real protective utility or durability. Is a tempera paint, it may be asked, capable of providing a better protective coat (artistic and economic questions being taken into account) than any other ordinary coating? The answer will be sometimes "Yes" and sometimes "No." The very term "tempera" implies some sort of intimate bond or ultimate chemical action between the coating and the surface to which it is applied. It is a matter of common technical knowledge that both the pigmentary and the liquid binding ingredients, in some at least of the best modern tempera paints, are capable of forming hard and weather-resisting crusts or even compounds with the constituents of certain lime plasters and building stones. It cannot, however, be too strongly emphasised that quite different results are obtained when tempera paints are applied to unpainted old lime plaster or Bath or Portland stone and to oil-painted or other inert surfaces respectively. New cement is far from being an ideal ground for any paint material, nevertheless thousands of square yards are annually treated with tempera paint with, as might be expected, a varying measure of success. Unhappily the scientific aspect of paints and painting is little understood by the average architect and engineer, and it is possible, therefore, that the property owner does not always receive the best advice. Questions affecting hygiene and public health are kept well to the fore nowadays, as recent legislation and Home Office regulations bear witness. No inconsiderable part of the popularity of certain tempera paints has been due to the fact that neither in their composition nor in the results of their application and use can they be considered as other than strictly hygienic and sanitary materials. It is interesting in this connection to note that at least one tempera paint in Britain is, I believe, accepted by the factory inspection department of the Home Office as a "paint" in the sense that walls treated with it need be repainted only once in three years instead of once every twelve or fourteen months, as is the case when a distemper is used.

The attitude of the practical painter towards tempera paints is from the very nature of things an epitome of the foregoing considerations. To the painter who is master of his craft, and who is untrammelled by sentiment in such matters, the advantages or merits I have quoted in favour of tempera paints will readily appeal, and he may even be able to enumerate other points in which these materials stand pre-eminent. Criticism, however, is the leaven of knowledge, and there are certain points in connection with tempera paints which the practical painter does not forget to emphasise. One is that a tempera painted surface cannot, he says, be washed. Another is that tempera paints lack opacity and that good work cannot be done with less than four or five coats. Yet another criticism is that under the influence of bright sunlight out of doors curious colour changes sometimes occur, and a fourth objection is that under certain conditions indoors the paint becomes decomposed on the wall and spots or streaks of gummy matter appear. I have also heard criticisms passed as to the smell of tempera paint. I see in the room representatives of manufacturing houses, paint dealers, and practical experts, all straining at the leash to repudiate the innuendos and answer the criticisms I have suggested. I

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shall therefore leave the matter thus in the hope that the remarks which will fall from different members of the audience will result in the clearing up of misapprehensions, the removal of prejudice, and an increase in our common fund of technical and practical knowledge.

I have to thank Mr. William Fourniss and Mr. J. A. Christie respectively for enabling me to illustrate, by means of the panels which are displayed, typical decorative effects obtained by the use of a tempera paint.

Mr. J. Russell Thornbery said that in listening to the paper his mind was carried back a good many years, for he remembered the difficulties experienced a quarter of a century ago, but now water paint was accepted throughout the civilised world as a suitable and reliable material for wall surfaces. It was curious, however, that during those years there had been a corresponding increase in the gloss surface from the flat, and the increase of glossy surface had accompanied the increase of the matt surface. Mr. Smith had alluded to the spots which appeared so often and formed tears on the surface. The fault would not be found in the best water paints, for it was due to the absorption and extraction from the surface of some of the gelatinous matters in the paint. The surface should be such that the condensation could run down the surface of the paint, and it was well known that water paint could be made to resist atmospheric condensation. Owing to the cutting of prices in tendering for work rubbish was placed on the market, and the whole class of material known as water paint came to be depreciated, whereas good water paint would stand well used in either inside or outside decoration. Of course, a good deal of the permanence would depend upon the colours selected. Many water paints were tinted up by builders and painters without their having any knowledge of how the original material was prepared, with disastrous results. Then, again, carelessness in mixing would produce bad effects, but granted that ordinary care was taking in mixing and application, the speaker said there was no reason why permanent and excellent work should not be accomplished with water paints.

Mr. J. H. Christie suggested that there were so many classes of water paints it was difficult to consider the advantages and disadvantages of the material and arrive at a definite conclusion. Certain water paints partook more of the nature of ordinary sized distemper, and there were others which might be classed to some extent as oil paints. In the different classes they found advantages and disadvantages, but the man who could justify his position as craftsman or practical painter should know how to suitably select his material. The speaker said Mr. Smith had not mentioned in the list of difficulties suggested by him the great one of obtaining a uniform and flat surface on a wall which had been made up or repaired with plaster of some kind. Such walls were responsible for a good many of the complaints brought against water paints. The parts made up presented a different texture and surface, since they would be more absorbent, and care should be exercised to stop the porous nature of new surface.

Mr. Millar was in favour of a wider application of water paints as against materials the components of which contained size, which he described as a semi-putrid matter. Water paints too were cheaper and could be applied more quickly, and as a filler or primer of woodwork the material overcame a trouble which so often confronted the decorator. They were also as reliable for outside work as for inside decoration, and the colour was always true. He believed that painters sometimes expected too much from the material, and belittled its qualities when used under conditions in which oil paint and wall paper had failed to stand.

Mr. C. Harrison Townsend, F.R.I.B.A., said he would like to be sure whether they could talk indiscriminately of distemper and tempera. In the former he recognised a material which was neither, on the one hand, quite fluid and transparent or thick and viscous like oil, and in tempera he understood the application of perfectly fluid and transparent colour to an already prepared ground. He wished also to know whether anybody could tell him that there was such a thing as a washable distemper, by which he meant a distemper which could be sponged over and afterwards regain its original tone.

Mr. William Fourniss considered any paint which obviated the risk of lead poisoning was superior to oil paint, though he did not agree that better quality of tone and quicker application could be obtained in water paint than in fresco.

Mr. J. G. McIntosh considered that lead poisoning was brought about by dirty habits, and a colour therefore containing lead could not be held accountable for accidents when those who used it had no regard for cleanliness.

Mr. A. S. Jennings was a little surprised, he said, that the discussion had not included a comparison between water paints and wall papers. There was a good deal to be said for both as means of decoration. In connection with wall papers, he thought the law should be enforced against the practice of placing a clean paper over a dirty one. Whatever might be said against the semi-putrid matter contained in size, it was a worse fault, he believed, to cover an already soiled paper, and for hygienic reasons the practice should be made illegal.

Mr. George Line, taking up the suggestion of the last speaker, referred to the relation of wall papers to water paints. It would be admitted, he said, that the general public appreciated the wall paper beyond any other form of wall decoration which could be adopted at low cost. It was quite possible and probable, even in regard to an admitted increase in the use of water paints or the decoration of the apartments of the private house, that the public were likely to tire of a plain painted wall surface more frequently than they would tire of the printed wall paper, and consequently would revert to the use of wall papers. On the other hand, the standard of public taste (never a very high one) was certainly being raised, though but slowly. The speaker therefore anticipated that the good points and the proper use of plain paint in the decoration of the house were likely to be increasingly recognised. The use of paints would consequently increase, but not to the extent of affecting to any marked degree the use of wall papers. He was more inclined to that view, because in the decoration of the average house the questions both of time and cost entered very largely. If it could be anticipated that paint manufacturers would be able to supply paints at such low prices and with such despatch as to compare favourably against the same costs incurred in the use of wall papers, then they could regard the prospects of a largely increased adoption of paint as correspondingly brighter. But even should such a favourable comparison materialise—and the speaker considered it improbable—he said he would still believe that the wall paper would maintain its popularity because it was less official and more in keeping with the British idea of homely comfort, and was generally regarded as more complementary to the furnishing itself—in fact an item of the furnishing of the house when selected with judgment and taste.

ILLUSTRATIONS.

THE WEST END, ST. BARNABAS CHURCH, MITCHAM, SURREY.

PARTICULARS of this church were given with an illustration of the south-east view which appeared in our issue of May 21. The architect is Mr. H. P. Burke Downing, F.R.I.B.A.

QUENBY HALL LEICESTERSHIRE.—ENTRANCE GATES.

THIS illustration completes our series of measured drawings of Quenby Hall, by Mr. W. Stead Mills. The gates now shown were described last week.

DETAIL OF COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

WE now give two more examples of modern detail as exhibited in the recent competition for the new County Council offices for Berkshire at Reading. The authors of these are respectively Messrs. Nicol & Nicol and Messrs. North & Robin.

The Northumberland education committee have decided that, notwithstanding the decision of the Local Government Board, the erection of a school and caretaker's house at Morpeth, at an estimated cost of 8,600*l.* and 320*l.* respectively, be commenced forthwith. The Local Government Board consented to a loan of 7,500*l.*, but would not consent to the full loan applied for. The committee decided that the educational needs of Morpeth should be looked after, notwithstanding the rebuff. With regard to the items for which the Local Government Board would not give their consent to a loan, the Board are prepared to consider them when they are presented with a total bill of cost. If they disallow any of the amount expended, the difference will have to be paid out of the rates. A discussion ensued as to whether the Local Government Board would decline to sanction the borrowing of any portion of the money required if the committee built the school before their consent was given to the entire scheme. It was eventually agreed that such a course was not probable, and the report was adopted.

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DETAIL OF COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING,

Messrs. NICOL & NICOL, Architects.

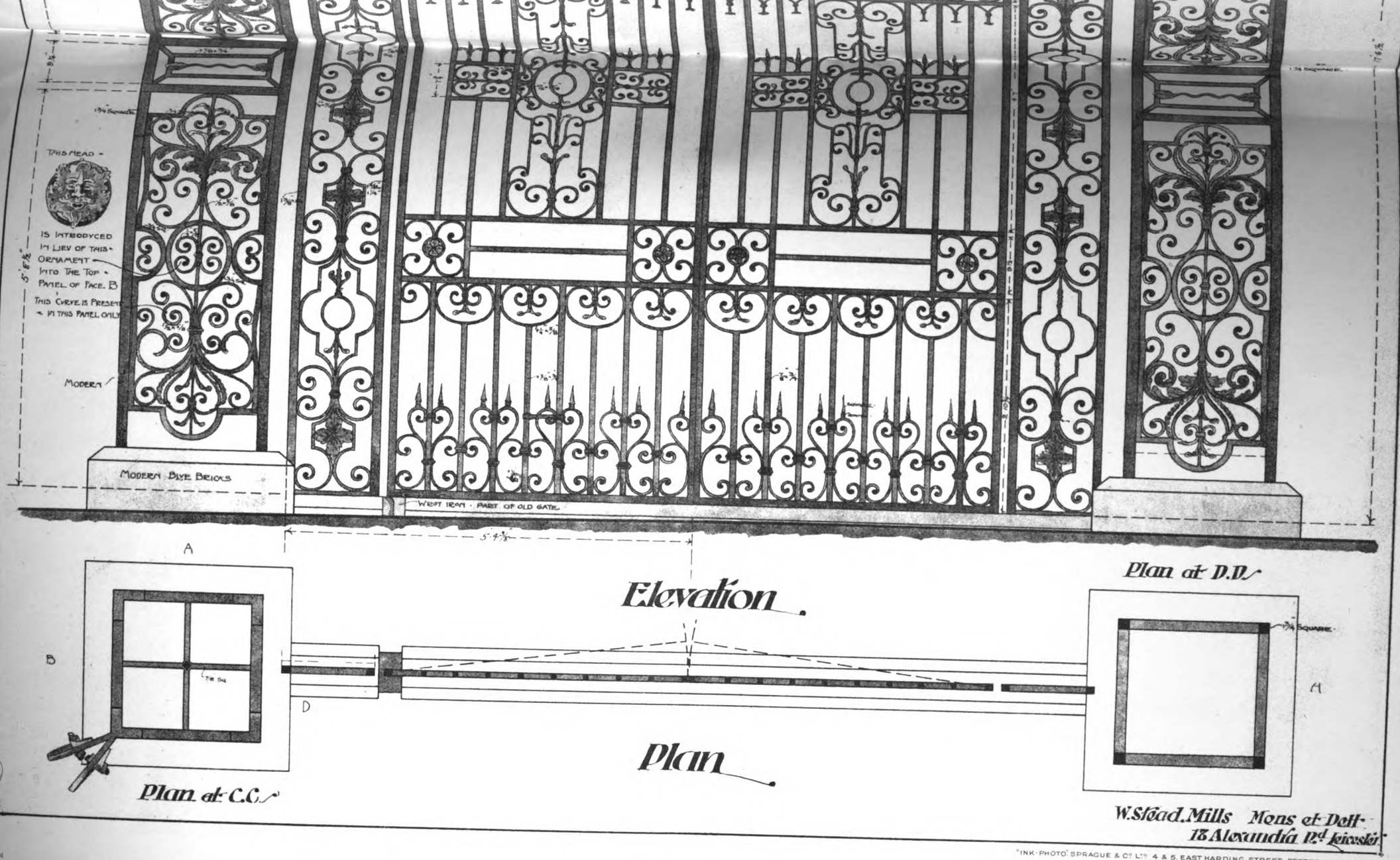
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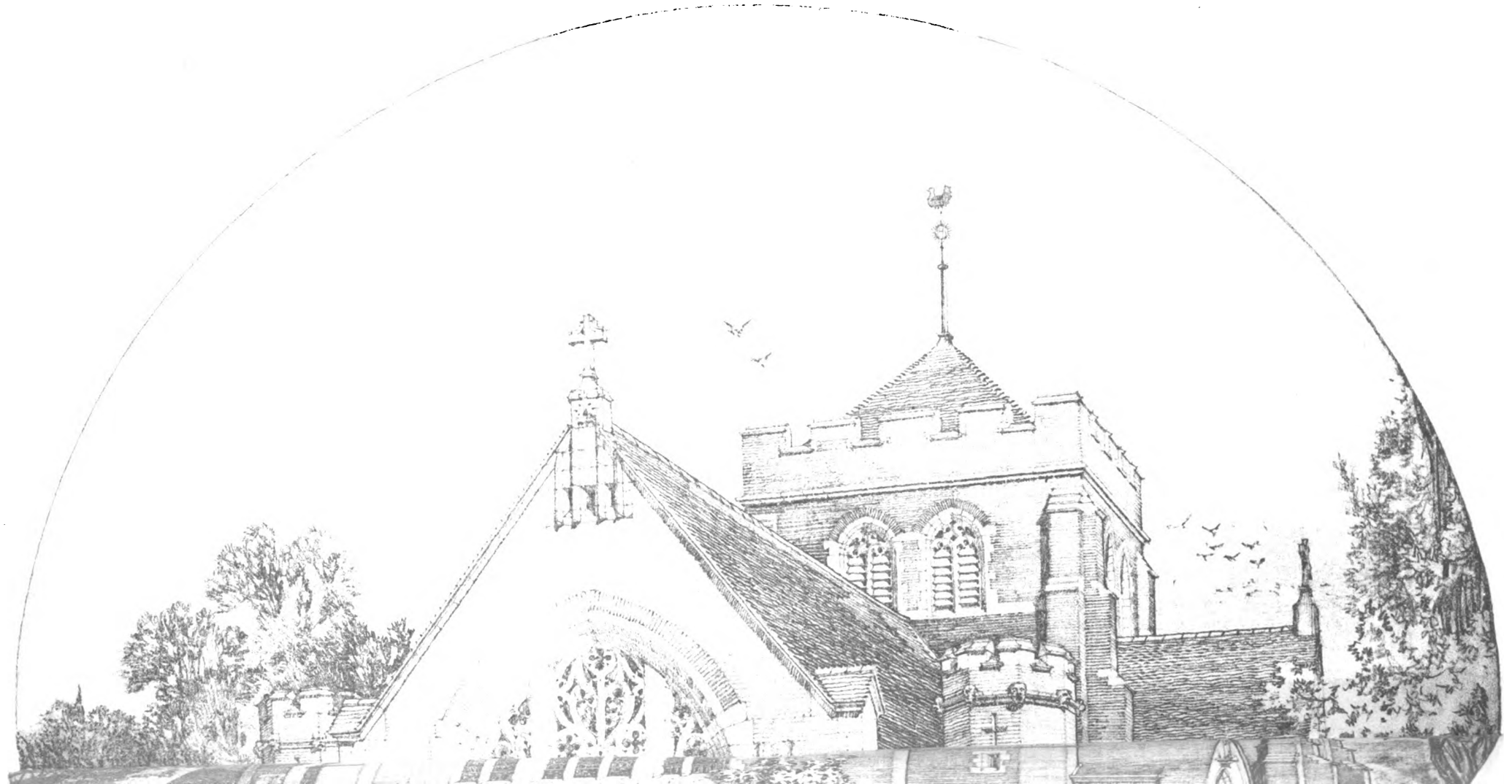
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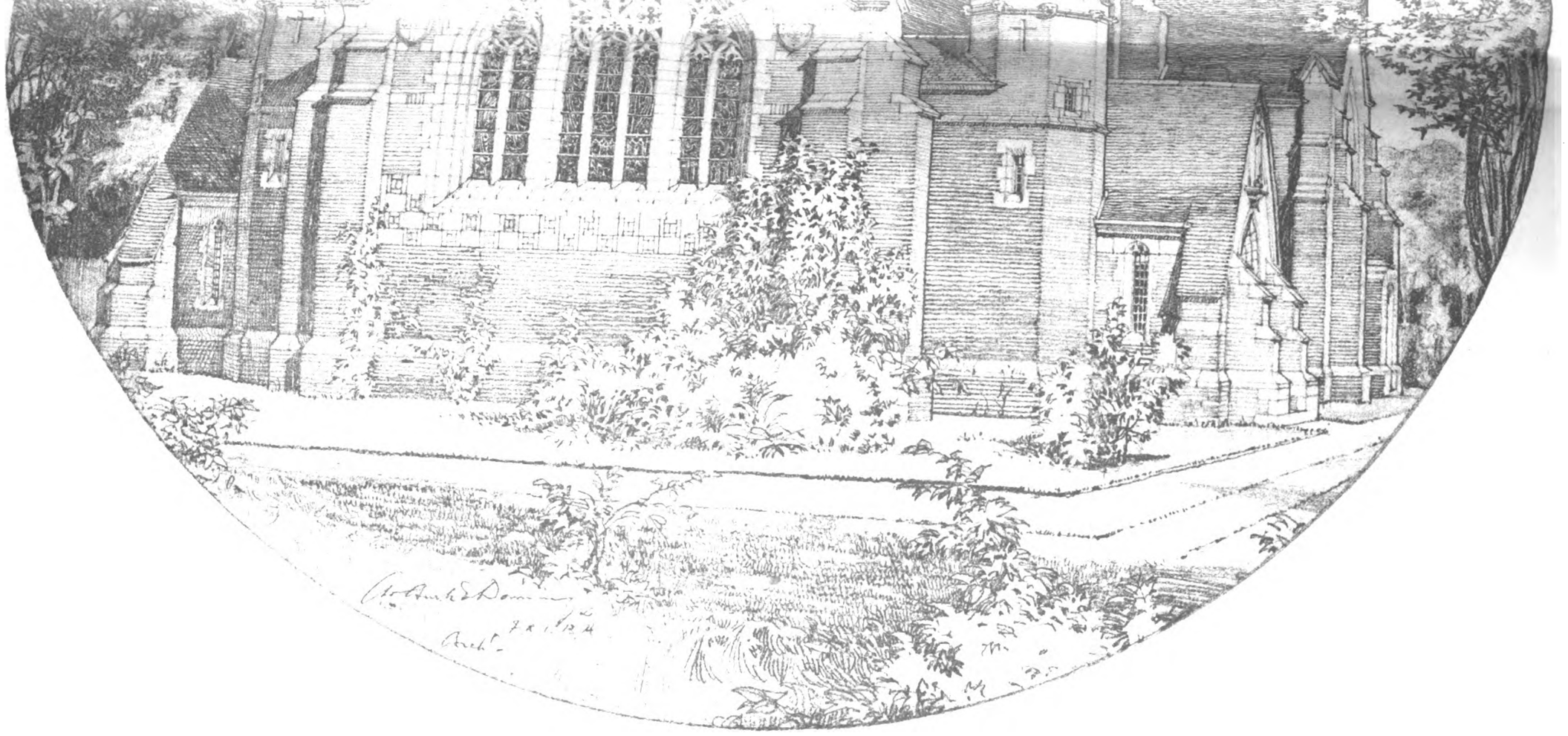
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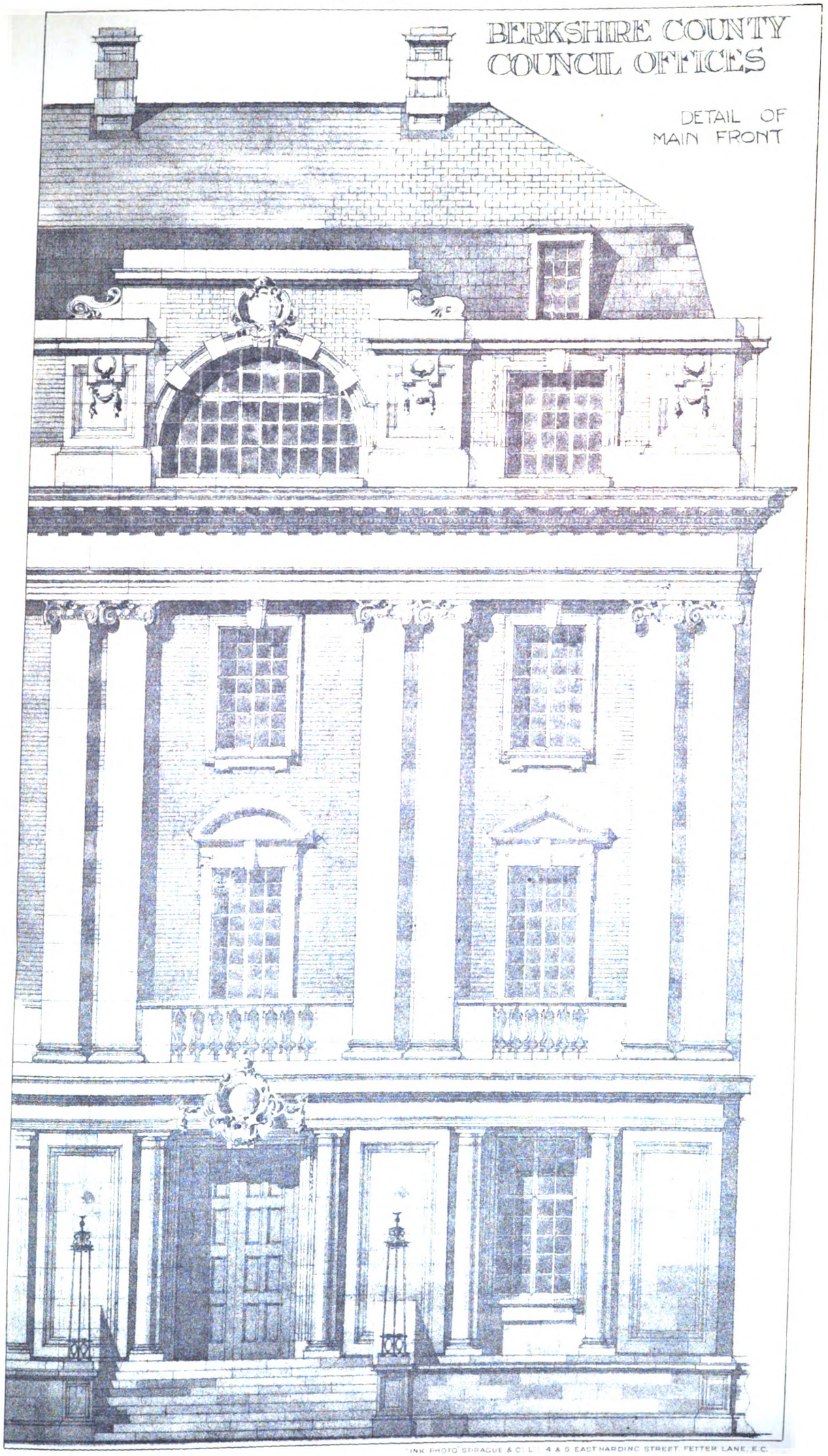


THE WEST END, S. BARNABAS' CHURCH, MITCHAM, SURREY.
FOR THE CITY OF LONDON SCHOOL MISSION.
H. P. BURKE DOWNING, F.R.I.B.A, Architect.

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DETAIL OF COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

Messrs. NORTH & ROBIN, Architects.

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THE PRACTICAL ADMINISTRATION OF TOWN PLANNING POWERS.*

(Concluded.)

How the Act Affects Existing By-laws.

IT will be observed that instead of town planning schemes being subject to existing by-laws and regulations, these by-laws have to be made subservient to the town planning schemes. This is as it should be. Much of the benefit to be obtained under the Act will be in enabling authorities to vary the by-laws in accordance with special circumstances. There is no further reference to by-laws in this part of the Act, but section 44 of the first part of the Act has an important bearing on town planning schemes. It reads as follows:—

"If the Local Government Board are satisfied, by local inquiry or otherwise, that the erection of dwellings for the working classes within any borough, urban or rural district, is unreasonably impeded in consequence of any by-laws with respect to new streets or buildings in force therein, the Board may require the local authority to revoke such by-laws or to make such new by-laws as the Board may consider necessary for the removal of the impediment."

By-laws at present in force do not allow for the fact that the arbitrary division of the country into urban and rural districts is misleading. An "urban district" may be almost purely rural, and a "rural district" may have within its boundaries a population of thousands concentrated in a town or large village. By-laws cannot, therefore, be suitably and fairly prescribed for "urban" and "rural" districts as such. Those for both districts should be capable of at least three different interpretations, according to three clearly specified sets of circumstances or conditions. The local authority should have power to apply the same by-law in three different ways, or to adopt one of three alternative by-laws for:—

1. The area of any district which has grown up prior to the by-law period.

2. The suburbs of towns and villages or any area of vacant land within their boundaries which come within the definition of the Town Planning Act, as "land likely to be used for building purposes." By-laws should not only prevent bad sanitation, they should encourage sanitary well-doers. On new building areas the man who erects say ten houses to each acre should have some concession given to him as compared with the man who erects say thirty to forty houses to each acre.

3. The purely rural parts of urban and rural districts which are likely to remain agricultural.

It is needless to say that the suggestion is not that by-laws should be capable of interpretation to suit the ideas of local authorities or surveyors. They should be capable of a certain elasticity, but this should be subject to clearly specified conditions attached to each by-law, outside of which no departure can be made or discretionary power exercised. Any such departure should only be possible in the direction of encouraging more healthy conditions, particularly in regard to the provision of air space. For instance, any permission to reduce the width of a non traffic street should be subject to the authority getting a *quid pro quo* in the form of a wider street where required for a main thoroughfare or additional open spaces for children's playgrounds or general recreation. Of course, where 24-feet streets are permitted, the minimum distance between the building lines should still exceed 36 feet

* A paper read at the Guildhall, London, by Mr. Thomas Adams, on December 10.

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and should in fact not be less than 50 feet. The question of curtilage round the houses should not be determined by the faulty method of basing it on the width of streets or a minimum of paving at the backs of the houses, but by the determination of the building line and the limitation of the number of houses to be erected to each acre. It will be observed from sub-section 59 that for the first time in an Act of Parliament provision is made for limiting the number of buildings that can be erected on any acre of land according to what the Local Government Board considers as reasonable, having regard to the nature and situation of the land. Undoubtedly, one of the chief causes of unhealthy conditions and overcrowding is the extent to which new houses are being closely packed together on newly developed land. If, however, there is to be any considerable limitation to the number of houses that can be erected on each acre, provision must be made for cheapening the cost of land development. By-laws must therefore be made sufficiently elastic to provide for this. Where roads are constructed solely for the domestic requirements of the houses, they should be limited in width to the needs of these houses. This is especially so where large gardens or open spaces are provided. On the other hand where through thoroughfares have to be constructed they should be more adequate than at present; but the cost of enlargement beyond a certain minimum width should be met by the community as a whole, except in so far as it can be met by compensation from the owners whose property may be improved by their construction.

We thus see that town planning will not necessarily increase the expense of development, but rather the reverse. The time at my disposal does not enable me to refer in detail to practical examples, but on a number of estates in different parts of the country which I have laid out, or assisted in laying out, as garden suburbs during the past two years, the presence of arbitrary by-laws has in almost every case necessitated the crowding of more houses on each acre of land than was necessary or desirable in the interest of public health. Whether the owner pays for this expensive development or not it is invariably added to the cost of the dwellings, and consequently paid for by the tenants, either in the form of increased rent or reduced amenities.

Suspension of Statutory Enactments.

In cases where the suspension of statutory enactments are considered necessary parliamentary approval must be obtained.

Responsibility where Land in Different Districts.

Where the land is in the area of more than one local authority, one authority may be responsible for the scheme, or a joint representative body may be constituted for the purpose. In London County the London County Council shall be the responsible body.

Procedure Regulations.

The Local Government Board may make regulations for regulating the procedure to be adopted with respect to applications for authority to prepare schemes, and all subsequent steps, reports and enquiries. Provision shall be made by these regulations:—

(*a*) For securing co-operation with owners and other persons by means of conferences and such other means.

(*b*) For securing that notice of the proposal to prepare or adopt the scheme should be given to any Council interested.

(*c*) For dealing with the other matters mentioned in the fifth schedule to this Act.

Fifth Schedule—Procedure.

We now come to deal with the fifth schedule, which will have an important bearing on the working of the Act. This schedule gives us the order of procedure as follows:—

1. Procedure anterior to and for the purpose of an application for authority to prepare or adopt a scheme:—(*a*) Submission of plans and estimates; (*b*) publication of notices.

2. Procedure during, on and after the preparation or adoption and before the approval of the scheme:—(*a*) Submission to the Local Government Board of the proposed scheme, with plans and estimates. (*b*) Notice of submission of proposed scheme to the Local Government Board. (*c*) Hearing of objections and representations by persons affected, including persons representing architectural or archæological societies or otherwise interested in the amenity of the proposed scheme. (*d*) Publication of notice of intention to approve scheme and the lodging of objections thereto.

3. Procedure after the approval of the scheme:—(*a*) Notice to be given of approval of scheme. (*b*) Inquiries and reports as to the beginning and the progress and completion of works, and other action under the scheme.

4. Duty, at any stage, of the local authority to publish or deposit for inspection any scheme or proposed scheme, and the plans relating thereto, and to give information to persons affected with reference to any such scheme or proposed scheme.

5. The details to be specified in plans, including, wherever the circumstances so require, the restrictions on the number of buildings which may be erected on each acre, and the height and character of those buildings.

There has been some criticism of the order of the steps to be taken under this schedule, but personally, at this stage, I see no grounds for such criticism, although no doubt subsequent amendments may be necessary in the light of experience. Attention may be drawn to the implied invitation in the schedule for schemes to include provisions for limiting the number of houses to each acre.

Compensation.

It is obvious that the success of town planning as understood by the Act will be determined not only by its desirability, but also by the economies with which it can be carried out. I have already referred to possible economies as a result of varying the by-laws. There is also the comparative economy of the procedure necessary to obtain sanction for a scheme. The Act provides for further economies in regard to the compensation to be paid to owners. Compensation will be paid to anyone injuriously affected, but there are important reservations. The very nature of a town planning scheme suggests the possibilities of great saving as compared with schemes of reconstruction carried out when the public need for an improvement becomes desperate. Street improvements in our cities and towns under existing laws are anticipated by private individuals long before they are executed, for the simple reason that they are never executed till the need for the improvement is apparent to everyone.

Economies which can be Effected by Town Planning Schemes.

Under town planning you may look twenty or fifty or more years ahead and you only compensate for the damage done at the date of the application for authority to prepare the scheme. (Sec. 58, sub-sec. 2.)

"A person shall not be entitled to obtain compensation under this section on account of any building erected on or contract made or other thing done with respect to land included in a scheme after the time at which the application for authority to prepare the scheme was made or after such other time as the Local Government Board may fix for the purpose.

"Provided that this provision shall not apply as respects any work done before the date of the approval of the scheme for the purpose of finishing a building begun or of carrying out a contract entered into before the application was made."

Observe the enormous possibilities of this section in the direction of preventing claims being built up when an improvement comes to be effected, of limiting the speculative instinct of enterprising local financiers, and of encouraging local authorities to prepare town planning schemes out of consideration of economy. It has been suggested that one of the weaknesses of the Act is the absence of compulsion on local authorities to prepare schemes whether they like or not. I fancy that when the possible saving which may be effected under these schemes is realised no sort of compulsion will be necessary. Again, if any property is increased in value by the making of a scheme the authority carrying it out may recover half of the amount of the increase. The opportunity of recovering this half of the increase represents a great advantage to local authorities compared with what is possible under the existing law.

A single arbitrator appointed by the Local Government Board shall determine any question of compensation under this section.

If a scheme is revoked a person who has incurred any expenditure in order to comply with it will be entitled to recover the amount of this expenditure in so far as it is rendered abortive by the revocation. He will not, apparently, be entitled to any claim for injury caused to his property by holding it out of the market, or due to any uncertainty caused by waiting for the scheme to be executed. It is therefore important that a scheme should not be hurriedly or inconsiderately approved, as its revocation might lead to hardship where owners were compelled to accept a scheme against their wishes.

I have already referred to section 59, which provides that no compensation can be claimed by reason of provisions which could have been enforced as by-laws, or provisions which for purposes of securing amenity limit the number of houses which may be erected. They are of extreme importance.

Acquisition of Land.

Land may, of course, be acquired by agreement, and procedure for compulsory purchase is greatly simplified com-

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pared with the procedure under previous Housing Acts. These amended provisions are set out in the first schedule to the Act. An order has to be submitted by the local authority to the Local Government Board putting in force the provisions of the Lands Clauses Acts. The order will be duly made if confirmed by the Board. No additional allowance will be made on account of the purchase being compulsory. Any question of disputed compensation shall be determined by an arbitrator appointed by the Board. If a person interested in the land objects a public enquiry must be held in the locality by an impartial person, not in Government employment, to ascertain whether the land is suitable and whether it can be acquired without undue detriment to the owners. If the report is unfavourable to purchase the order shall be provisional only and shall not have effect unless confirmed by Parliament.

Powers of Local Government Board in Case of Default.

Section 61 confers powers on the Local Government Board to compel a local authority to adopt a scheme or to carry into effect a scheme which has been confirmed. The most notable provisions in this clause are those which enable representation to be made to the Local Government Board by any person or persons, and the power it gives to owners of land to initiate a scheme. As an alternative to compelling an authority to prepare a scheme where it thinks this necessary, the Board may approve a scheme submitted by an owner of land as if it had been adopted by the local authority.

Co-operation of Private Owners.

I consider this provision of great value. Whatever suspicions may be entertained regarding owners of land—and they are in very many cases unfounded—they are usually better qualified to exercise judgment and foresight in regard to the larger issues in connection with the development of land than are many members of our local authorities. Of course, I say this without any disparagement to the ability and disinterestedness of local representatives. But on questions of land development many owners are peculiarly expert and capable of exercising more foresight than those trained in commercial pursuits. Under this Act the power of the selfish owner to benefit himself too freely from public improvements is much restricted, and, that being provided for, it is well that every encouragement should be given to owners to initiate schemes of development on sound lines. This being so, almost as much may be expected for a time from the initiative of large owners of suburban land as from local authorities. What is wanted is broadminded tolerance on the part of all concerned. Housing reform suffers as much from the extremes of many of its friends as from the greed of speculative owners of land. What is often interpreted as selfishness on the part of owners is nothing more or less than resistance to the uncompromising hostility of extremists. This Act invites co-operation between local bodies and owners, and much depends on the spirit in which these two parties enter upon their negotiations. It is true that many of the small speculative owners, and probably some of the large ones, may have to be brought into line against their will, just as, on the other hand, some authorities will have to be made to appreciate the foresight of landowners in their districts. But, generally speaking, I feel that much may be expected from this co-operation, and much of the success of the Act will depend upon it.

I feel some pride in having been the adviser of the owner who initiated the first scheme of this kind in this country, and I look forward with great hope to the future working of the Act in this direction.

Future Town Planning.

It is obvious that there are two ways in which most of the town planning in the country will be carried out under the Act. One will be by the action of local authorities in developing suburban estates of their own, or in purchasing land for the special purpose of controlling its development; the other will be by the co-operation between local authorities and private owners of land to secure the layout of the suburbs on right principles. No one who is fully acquainted with the character and conditions of English local government will deny that most schemes, at least for some years to come, will be carried out by the second of these methods. Landowners who are favourable to this method of development will be in a position to render great public service by co-operation with the authorities and without any real sacrifice of their legitimate interests. The excellent work which is being done by co-partnership societies under the able leadership of Mr. Henry Vivian, M.P., both in erecting houses and in planning large and small areas on the right principles, will be greatly and deservedly stimulated by the Act.

Local authorities that are broadminded enough to consider the future gain to their towns and districts by incurring the expense of preparing plans for the development of the whole of the vacant land within and surrounding their boundaries, will learn to appreciate the value of their work, its economies to the ratepayers, its commercial value to their town or city, its power to elevate the character, inculcate the love of beauty among the citizens, and generally to awaken a civic consciousness that will help in the solution of most of our social problems. It will be appreciated in their own day, but much more in the days to come. This will be moderately so in the case of those authorities who fulfil their bare duty, but it will be eminently so in those cases where the work is taken up in the right spirit by the right men, and carried out on scientific principles with proper consideration of every aspect of civic life and growth.

SHORT METHODS OF CALCULATION FOR CHECKING REINFORCED CONCRETE WORK.*

By E. FIANDER ETCHELLS, F.P.S., M.M.A., A.M.I.M.E.

(Concluded from last week.)

LET us take another example and work it out both ways. Let us take a rectangular beam of the following dimensions:—

Breadth = 8 inches.
Total depth = 16 inches.
Cover of rods at underside = $1\frac{1}{2}$ inches.
Reinforcement = 3 rods $\frac{3}{4}$ inch diameter.

The distance from the underside of the beam to the centre of gravity of the three rods will be $1\frac{1}{2}$ inches + $\frac{3}{8}$ inch = $1\frac{7}{8}$ inches.

The effective depth of the beam will be 16 inches − $1\frac{7}{8}$ inches = $14\frac{1}{8}$ inches.

The value of $bd = 14\frac{1}{8}$ inches × 8 inches = 113 square inches.

The area of one rod $\frac{3}{4}$ inch diameter = 0.44 square inch.

The total area of the tensile reinforcement $A_t = 0.44 \times 3 = 1.32$ square inches.

Let p = the *percentage* of steel, then

$$\frac{1.32 \text{ sq. in.}}{113 \text{ sq. in.}} = \frac{p}{100}$$

Multiplying both sides of this equation by 100, the hundreds on the right-hand side will cancel out, and we will get

$$\frac{100 \times 1{\cdot}32}{113} = p = 1{\cdot}17$$

That is, the percentage of steel to the area $bd = 1.17$ per cent.

Using the diagram for finding the position of the neutral axis, we find that

$$n = 0.44d.$$
$$= 0.44 \times 14.125$$
$$= 6.21 \text{ in.}$$

The area of concrete in compression (*i.e.*, the area above the neutral axis)

$$= b\ n = 8 \text{ in.} \times 6.21 \text{ in.}$$
$$= 49.68 \text{ in.}$$

The stress at the compressed edge will be 600 lb. per square inch.

The compressive stress at the neutral axis will be zero.

The mean stress will be $\frac{600 + 0}{2} = 300$ lb. per square inch.

Expressing this in thousands of pounds, so as to reduce the number of figures, we can say that the mean stress per square inch will be $\frac{300}{1{,}000}$ or ·3 thousands of pounds.

The total compressive force above the neutral axis $= .3 \times 49.68 = 14.9$ thousands of pounds (or 14.9 milals).

Now, the centre of pressure will not lie in the centre of the area above the neutral axis; it will be nearer to the compressed edge. Its calculated position is one-third of n from the compressed edge—that is to say, that the centre of compressive force is 6.21/3 = 2.07 in. from the compressed edge of the beam.

The lever arm [or the arm of the couple formed by the compressive force above and the tensile force below] will be the distance between the centre of pressure and the centre of gravity of the tensile reinforcement.

That is $d - \frac{n}{3} = a$, where a is the arm of the couple.

* A paper prepared for the meeting of the Institution of Municipal Engineers on December 11.

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In our case

$$a = 14{\cdot}125 - \frac{6{\cdot}21}{3}$$

$$= 14.125 - 2.07$$

$$= 12.055 \text{ in.}$$

The resistance moment in terms of the compressive force

= Compressive force × lever arm

= 14.9 × 12.055 in.

= 179.6 thousands of inch-pounds

= 179.6 milal inches.

Now this has been worked out fully, but by using our approximate rule we get

$$\left(\frac{90 + 20 \times 1{\cdot}17}{1{,}000}\right) b\, d^2$$

$$= \left(\frac{90 + 23{\cdot}4}{1{,}000}\right) \left(1{,}596\right)$$

$$= 181{\cdot}1 \text{ thousands of inch-pounds.}$$

Comparing this result with the previous 179.6, it will be seen that this approximation is sufficiently accurate for all practical purposes, more especially having regard to the inevitable variability of concrete.

The resistance moment in terms of the tensile stress will be

$$A_t \,.\, t \,.\, a =$$

= 1.32 sq. in. 16.8 milals × 12.055 in.

= 270 thousands of inch-pounds nearly.

Thus the tensile resistance greatly exceeds the compressive resistance, as was to be expected.

These examples have been set out at length only in order that the relative speed of the two methods may be contrasted and the results compared.

TOWN PLANNING IN ANCIENT AND MODERN TIMES.*

SCAMOZZI, architect of the Procurazie at Venice, and one of the great theorists of the Renaissance period in Italy, uses, in relation to the difference between town planning in antique times and in his own, in his book "Ideas about Universal Architecture," the words:—"La differenza de tempi tra gli antichi e noi ha causato tanta diversità nelle cose come anco nel fare le citta" (The difference between ancient times and our own in regard to town planning is, as in regard to everything else, a great one). Vitruvius was for a long time the authority in this field, until a great intellect like Michel Angelo broke away from the ancient expressions of form to the advantage of the views of his time. The architects of the Renaissance sought, as in the age of Pericles, to secure the artistic unity of the towns, and the problem therefore assumed quite another standpoint than that which seems best for our time. Now quite other factors are of controlling influence. The traditions of the Renaissance maintained this in the planning of the princely municipal foundations of the eighteenth century. No greater difference however can be found than that between our age and that of any period of the past in reference to town planning and town enlargement. During the different ages of the past the principle of the greatest protection against attack from the outside found expression in the building of a circle of fortifications and the placing of certain boundaries to local extension. In our time the principle of unlimited expansion prevails. The old towns, whether they grew or were planned, represented unity, exclusion, and grouping around a political or religious centre. Their development was in connection with this centre. They represented, as Professor Eberstadt says, the centripetal principle, whilst in modern times the centrifugal principle prevails. In modern times we seek to extend the settlements always farther out into the meadows, the woods and the fields. In old municipalities they distinguished between the "old town" (Aldstadt) and the new one (Neustadt)—that is between the original nucleus and what was created later. The town and its population formed a concentrated totality for the outsiders. Now many quarters of a town are larger than whole towns formerly were. The distinction generally is between the centre, east end, west end, north side, and south side. In these cardinal points live men who are almost antipodally removed from one another. Many a man who lives in the west end of a great city knows only from the geography of his country that an east end exists and that men also live there.

In former times the centre around the royal castle, the oldest cathedral and the town hall was considered as the best situation for the residence of the principal wealthy citizens. Traffic was concentrated here. Foreign nations had their trading place here. The periphery and the quarters nearest the gates were on the other hand looked upon as less respectable. Now the situation has entirely changed. On the one hand wealthy citizens leave the dwellings at the centre for more roomy ones in more open situations, and at least in most of the German towns which have grown rapidly, the quarters on the outskirts and the suburbs suffer from the overflowing of the masses of the working class. There one sees the worst features of the density of population. Only those sections have remained central to which money flows in the form of taxes and rates, and these places show indeed a constantly increasing magnetic power.

If I stayed to consider antique towns with their great sanitary arrangements for sewage disposal, drinking water aqueducts, public baths and so forth, and considered the conditions of the towns of the middle ages and later times, with reference to their hygienic arrangements and precautions, then my time would soon be exhausted. Let me however point out that it was not an accident that the plague and other pests often nearly exterminated the population in old towns, and that the cholera appeared—even in our time—in serious form. It is only necessary to refer here to the last Hamburg epidemic. Our age, in which the public weal, in relation to sanitary work at least, is not merely a phrase, has however now taken measures to secure radical hygienic regulations to improve the faulty conditions of the old towns by sewerage and providing good drinking water, by the creation of air and light, and by limiting the exceeding closeness of the buildings. In reference to the last point, the relation between the built up places and those to be left open in the great towns is not to be considered as satisfactory everywhere. The regulations of every kind for the protection of health stand, on the Continent at least, before the greatest and most difficult problem of sanitary politics, the erection of sufficient healthy and cheap dwellings for the working classes.

In most of the continental capitals which have grown rapidly during recent decades the want of sufficient dwellings is not a new condition, but it is significant that this want has everywhere to-day become one of the most important points in the programme of the difficulties of our great towns. In Prussia, for example, more than 90 per cent. of the town population are obliged to live in small dwellings of one, two or three rooms. One might think that the greater part of the problem of town planning consisted in the most reasonable solution of the housing question. It might, but it does not. Here is one of the greatest differences between ancient and modern towns. The ancient towns, often several times enlarged, gave "room to live" to their population. That is one of the reasons of their artistic character. Modern towns are continually enlarged, but, nevertheless, great parts of their population have not sufficient room to live. This is one of the reasons of the inartistic expression in the physiognomy of modern towns.

If George Haw, who presented you ten years ago his book, "No Room to Live," had wished to study the same conditions on the Continent, he would not have had to speak only of "the plaint of overcrowded London." We are here before a very dark point of the building of the modern town. The housing question stands in the most intimate connection with everything which to-day is comprehended under the title of town planning, because in the domain of the protection of health it makes the most imperative demands. Half a century ago this was recognised only in its barest outlines. In more remote times practically nothing was known of the principles of hygiene in building towns, otherwise it would not have been possible for palaces, filled with works of art, even royal residences, to exist, in which no regard was taken for sanitary conditions. If this was the case with princes, one can easily imagine what the municipal provisions of this kind were. In this respect our age stands in the most pronounced contrast to the past. The question of the artistic difference between the appearance of the ancient towns and those of modern times can only shortly be considered here. Whoever makes a direct comparison of the old and the new with respect to beauty alone will find without doubt more beauty in the ancient towns. They are associated with the earth on which they stand. Leo Battista Alberti demanded a correspondence between the town plan and the locality. The engineering capacities, which are always developing in a greater degree and which make the removal of every local obstacle possible instead of going over it, cause our time to lose more and more the security in artistic things. It is for

* A paper by Professor Berlepsch Valendas, B.D.A., of Munich, presented to the National Town Planning Congress at Westminster.

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us to find for changed conditions the new artistic expression and to find ways which are in harmony with the powerful mechanical aids of our time. Former ages did not know these means, and, therefore, the command of nature was a controlling one. The transition process which transformed creative artistic power into inventive power did not find at once the æsthetic expression for its creations. Where it, independent as it is in its entire nature, inclined to the antique and used the garments of our ancestors, much greater mistakes were made than where it showed itself unadorned in its true nature. The unadorned expression has created fewer works that offend the eye than the endeavour to cover quite new forms (corresponding in material, construction and workmanship to our needs) with a mantle of the past, and thereby to bring form and contents into discord. Herein lies the reason of the low condition of architecture in the last half of the nineteenth century. It did not find the artistic expression which had to run parallel with a powerfully active time; it lived rather by borrowing. Certain principles in town planning will no doubt remain constant, such as the architecture of public and private buildings in their relation to the streets and places on which they stand, the construction of streets in respect to public places, the erection of fountains, of monuments, and of works of combined architecture and sculpture in relation to the surrounding architecture, &c. (In this respect many tasteless things have been done, for tastelessness is more international than anything else.) But to such permanent demands a great number of problems of an absolutely new character have been added. The most important point in this respect—a point which has produced an entire change as compared with former times—has arisen in regard to modern traffic facilities. The time can yet be remembered in continental towns when—as in Holy Russia to-day—the gates were shut at nine o'clock as a matter of course against all intercourse from outside. Now all this is changed. To-day the transport of food alone, that must come from all directions without interruption to a town of medium size, takes place at distances the overcoming of which would not have been possible at a time when there were no railways. Economic self-management by the towns, and the impossibility of a solution of the question of provisioning them from a distance were the simple reasons for the extraordinarily slow increase of the populations of the towns in the old times. The provisioning of the towns enlarged by new means of traffic have made the rapid increase of the town population, at the expense of the rural, possible. A large number of factors of development have, moreover, co-operated contemporaneously to force the building of towns in our time into entirely new directions. Traffic alone is not responsible for this change, and, indeed, may be regarded as one of its results. The immigration to the towns and the resulting change of the condition of the population, not in numbers alone, but with reference to the economic conditions, are the most important factors of the transmigration. In the ancient town the property holding citizens were in the ascendant whether they had a worldly or ecclesiastical lord or made their own laws, as was the case in the numerous free imperial towns of Germany. In the modern town the element which owns nothing is the greatest. It forms the most important support for productive labour in the main. This predominance of the propertyless element has brought with it an entire change, not only in the requirements of dwellings, but also in the whole character of the towns. In the economic small industry which five decades ago was predominant in Germany, and which in small towns is still important, the dwellings, the workshop, and also the shop were so combined that the workman in most cases not only worked at his trade in his master's house, but also lived there and belonged in a certain sense to the family.

When in the course of the development of factory work the small industry was forced aside, a separation of the dwelling and the workshop naturally took place. The latter was removed from the existing residence. The immediate demolition of the old does not indicate the beginning of the contrast between the new and the old, but an increasing settlement of new elements on the periphery. The results of this crystallisation caused little by little breaks in the old conditions. The result of this transfer of the workshops was the building of large quarters that are occupied exclusively by the working population. How these workmen's quarters developed in the beginning it is not necessary for me to describe more particularly. Before their existence the expression "overcrowding" was unknown. This word alone indicates the lowest point in civilisation of a whole period which is to-day not yet ended. The recognition that the compliance with hygienic requirements in regard to dwellings for the working population forms the foundation for national power has not yet been understood everywhere, and not by everybody even in the higher classes. Where the vigour of the people has been undermined by bad dwellings, national power must become also reduced. I will not pay you a compliment, ladies and gentlemen, but one thing is certain, and that is that England in this respect is not only the most advanced of all civilised countries, but that you, without town planning laws, were the first to recognise the importance of the whole subject and to undertake the remedy of the evil. In England the "industrial revolution" took place much sooner than in continental countries.

Let me now state clearly the view that town planning and town enlargement should, in the first place, provide the greater part of the population with good, cheap, healthy and modest artistic dwellings. Government institutions should endeavour to secure to the man who, in proportion to his income, bears the greatest burden of the State, not only insurance against illness, invalidity and the infirmity of old age, but in his days of health above all the certainty of a family life free from defect, the assurance that his children may become capable citizens and not candidates for the penitentiary and the gallows. Dwellings fit for men accomplish more than whole books full of moral laws, or an army of moral inspectors who live from the money of the taxpayers.

This is only possible when the State and the community endeavour to acquire as much land as possible, not for the purpose of selling again, as an object of commerce, but for the purpose of the public weal. The town must be able to be the master of its own development. The direction must not be determined by private interest, as has been the case till now, but by the interest of the community. Permit me to demonstrate this by two examples.

Example 1.—*Berlin.*

It is intended to combine Berlin and its numerous suburbs which already comprise a population of several millions. Apart from the difficulty of securing the proper administration of such a great town, it must be pointed out that the vacant building land at the centre will, under the present system of development, soon be covered with blocks of dwellings, and thereafter developments can only be made on the periphery. Land speculators have, however, acquired all the land purchasable for a great distance, and before long these speculators will be able to secure prices ten, twenty, and even fifty times greater than those paid for the land. Unless measures are taken to make the building of cheap small dwellings possible, independent of the manipulation of the speculators, there will be a further deterioration in the homes of the working classes. Until now action to secure this end has not been taken. Schools, hospitals, scientific institutes, open squares and recreation grounds were at no time provided by speculators, therefore the community will be compelled to acquire the ground in the future for a high price, that is, in other words, to raise the rates permanently. Moreover, for all these lands which around Berlin are still meadows, fields and woods, town plans approved for building block dwellings exist already. The carrying out of a really great, uniform, well matured plan is only to be thought of with an enormous sacrifice of the ratepayers.

The solving of the housing question for the 90 per cent. of the propertyless citizens of Berlin has so far not been earnestly thought of. Its proper solution would appear, in view of the prevailing land values, to be absolutely impossible. Whether in this case as in so many others, the future will sit in judgment on the faults of the past and pay the heavy cost, only time will show.

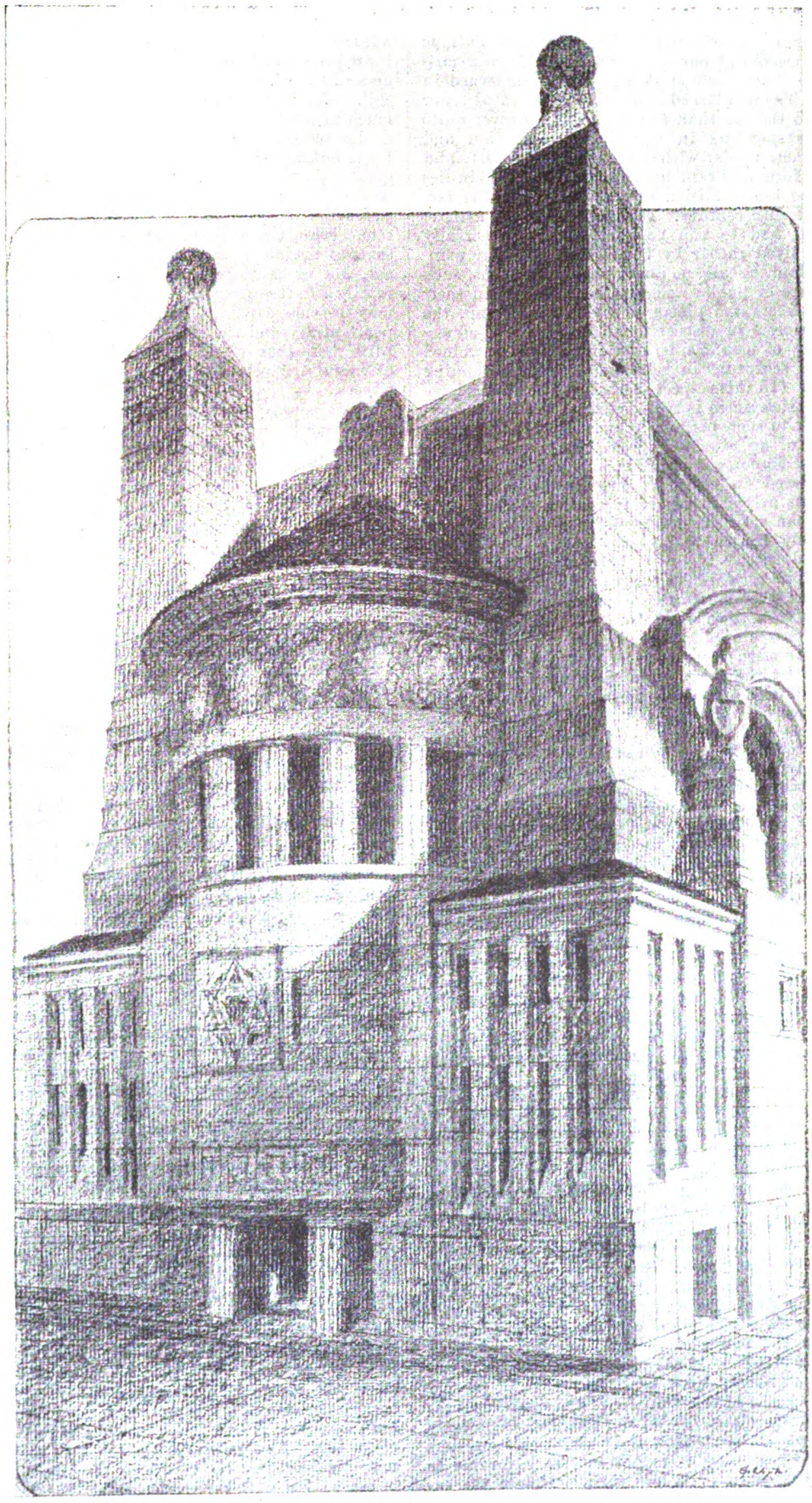
Example 2.—*Ulm.*

The second example does not refer to a great metropolis like Berlin, but to a town rich in historical past and historical monuments. This town, Ulm, was until recent years deprived of free development by the existence of a belt of fortifications. With the development of the science of modern fortification it has been possible to remove this interior fortification belt and thus render possible the enlargement of the town. The land on which these fortifications stood was acquired by the municipality. The town council became the master of the situation, not only in regard to the land acquired, but in regard to all the land on the outside of the belt. By this wise action the town council of Ulm has not only increased the wealth of the city by many millions of marks, but with rare civic wisdom has definitely used the possession of this land in the interests of the common weal by planning cheap sites for workmen's dwellings, not as in other cases in Germany, dwellings of the densely populated barrack type, but houses for two or three families. More

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MODERN EUROPEAN ARCHITECTURE.

HUNGARY-AUSTRIA.

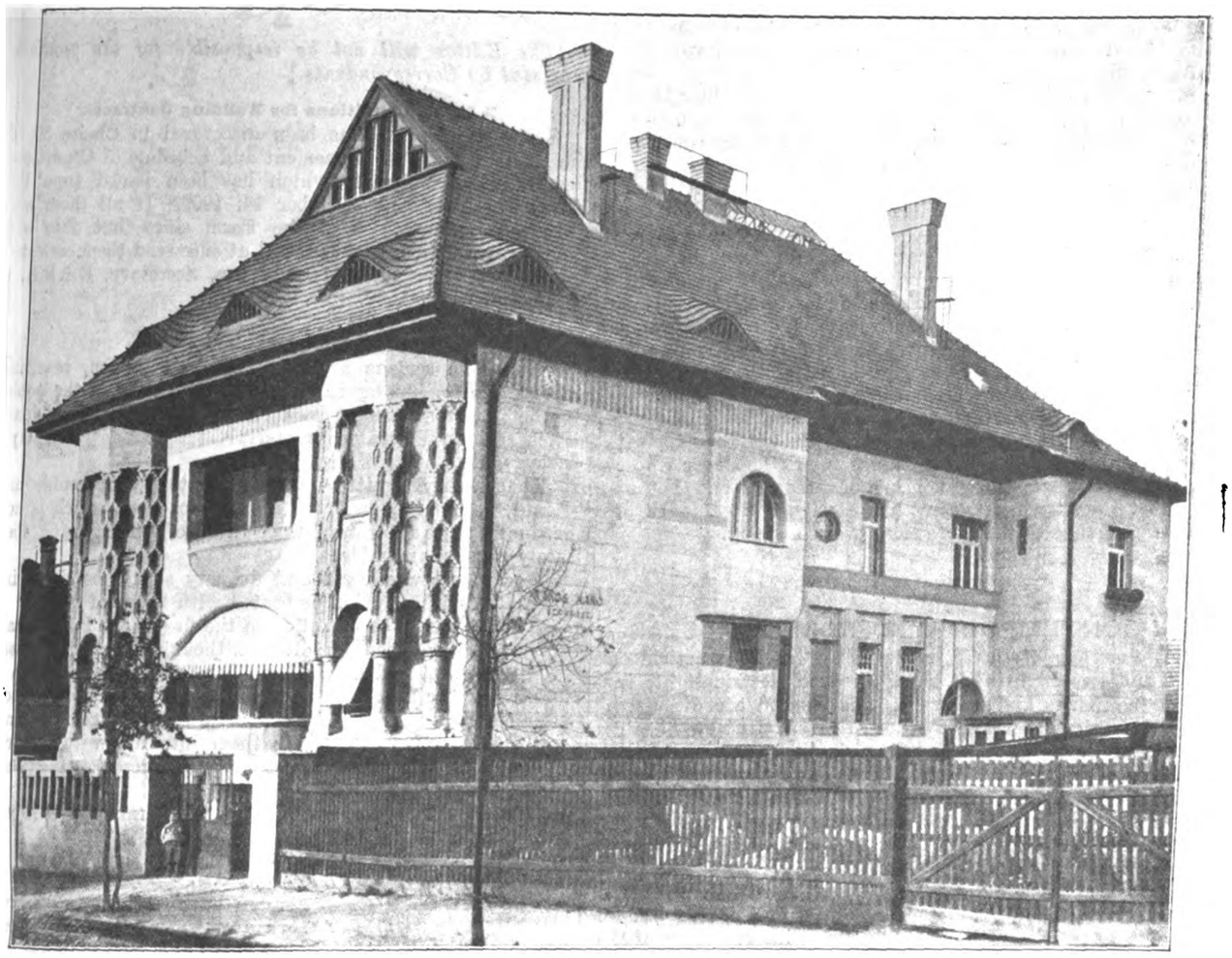


[From *Der Architekt*.

DESIGN FOR JEWISH SYNAGOGUE AT TRIEST.—Franz Matouschek, of Buda-Pest, Architect.

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MODERN EUROPEAN ARCHITECTURE.
HUNGARY.



[From *Der Architekt*.

RESIDENCE AT BUDA-PEST.—FRANZ MATOUSCHEK, Architect.

recently an improvement has been made upon this. Ulm is now building houses with gardens for one family, and has thus demonstrated that the provision of one-family homes, which is almost unknown in large German industrial cities, is possible if the proper steps are taken at the right time.

The Proper Development of Suburbs.

Under the conditions of development prevailing in most German towns to-day, everything is being done to maintain the supremacy of the centre. The building of educational, scientific, and artistic institutions is practically restricted to the centre. Centralisation has been the motto. As a result very great mistakes have been made. Nothing can be more perverted than the consequential carrying out of this principle in all departments of public life. Why should new settlements not have as good schools, as beautiful churches, libraries and museums as the centre?

What, then, are the principles to be followed in order to secure the right development of new suburbs? The foundations of a rational solution of this problem are to be found only when the following principles are borne in mind:—

(*a*) The restriction of the number of houses or rooms to be placed upon the land. In this way a most valuable restriction can be placed in regard to the density of population.

(*b*) The consideration of aspect in order that the maximum amount of sunshine may be secured for houses.

(*c*) Consideration of the prevailing winds in order that proper ventilation may be secured.

(*d*) Consideration of existing main roads.

(*e*) Careful provision of spaces for public buildings.

Nothing of real value can be done in town extension unless places are provided for public buildings from the beginning. This provision of sites for public buildings must be made as for a future town and independent of existing centres. In this respect the Hampstead Suburb gives a most valuable example.

New Conditions of Town Life.

In modern towns completely new conditions govern the developments, industrial and otherwise. The necessity for concentrating wholesale commerce and manufacture and for providing the necessary traffic facilities for this concentration is one great factor. It is equally necessary that the homes in which the workmen live should be removed from the bad, smoke-laden air of the industrial quarters.

These two factors alone render necessary two types of district planning, and render it imperative that in the town planning of our day we must face more and more clearly the question as to what purpose has to be served in the main in the laying out of new settlements. We must, moreover, realise that the interests of commercial intercourse render necessary a kind of planning quite unlike that for housing purposes. The proper methods of planning the industrial quarters of a city should rest on the geometrical proposition that the shortest distance between two points is a straight line. In these industrial quarters the quickest expedition of persons and things is most desirable.

The question which must decide the conditions of planning land for housing purposes is a completely different one. The cardinal considerations in this matter are considerations of physical and mental health. One thing must be clearly realised, viz. that the combination of commercial and dwelling districts such as existed in the ancient time is now impossible.

The Need for Simplicity in Development.

Finally, I may point out that we need more beauty in the development of our towns. Engineers realise that a machine must be relieved from every superfluous decorative weight and have only a bare beauty of purpose. In a similar way to secure that free human activity may reach its highest development consideration must be given to simple beauty of

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purpose. This is especially true in regard to the building of houses and the planning of land. We have gradually been satiated with conventionally architectural grandeur, and it begins to be tiresome. In the simplification of life are to be found from the beginning to the end all conceptions of beauty. In the vast labyrinth of industrial life we have lost Ariadne's thread, the measure of natural sympathy. In regard to architecture the old examples of town architecture can teach us proper methods and show us how a better fashion, a fashion corresponding to the spirit of our time, is to be formed. I have purposely avoided detailed criticism relating to town planning—social, hygienic, and artistic. In the time at my disposal it has only been possible for me to deal with general principles. It is true that some principles are of universal application, as, for example, the principles of hygiene. In studying the development of our towns, let us study these principles, understand clearly the reasons for the developments we advocate, and combat everything that is unreasonable, in contradiction to the nature of these developments. We cannot do better than recognise the truth of Jean-Jacques Rousseau's words, "Retournons à la nature" (Let us return to nature). Let us follow the nature of the circumstances under which our towns must develop and not act against those unwritten laws whose ultimate purpose is the ennobling of human life. Let us remember that town planning has always been a mark of culture, and that this is more than ever so to-day.

OUR CONTEMPORARIES FROM OVER-SEAS.

THE *American Architect* contains an excellent article on "Indirect Lighting" as applied to electric light, in which the merits and defects of this method are discussed. The illustrations comprise a full series from the New Theatre in Central Park West, New York, of which Messrs. Carrere & Hastings are the architects, and some further examples of the work of students of the Society of Beaux-Arts Architects.

La Construction Moderne illustrates several examples of workmen's dwellings erected for the employés of Krupp's factories.

Deutsche Bauzeitung gives further illustrations of the Baden Grand Ducal Government buildings at Karlsruhe. There is an article on the proposed street improvement of the Dresdener Strasse in Berlin, as object-lessons for which our contemporary gives illustrations of the Molière fountain at the corner of the Rue Richelieu and Rue Molière, and of the Fontaine Saint-Michel in Paris.

Architekten und Baumeister Zeitung illustrates yet another of the blocks of flats in the Neulinggasse of Vienna by Rudolf Erdös.

Arkitektur og Dekorativ Kunst reviews and illustrates the premiated designs in a competition for workmen's cottages in two classes, the one built of wood, the other with solid walls of brick or stone.

Het Huis continues its account of the picturesque town of Zaandijk, in North Holland, which fills the whole number.

The *Engineering Record* contains rather an interesting account of how a contractor's plant is arranged and worked in the erection of a high reinforced-concrete building, the example described being that at the construction of the Surety Building, Muskogee, Okla., a corner building eight storeys high, measuring 50 feet by 115 feet on plan. A description is also given of the method of recording photographically the setting of cement by the use of the apparatus invented by Martens, of the Royal Testing Laboratory in Gross-Lichterfelde, Germany.

COMPETITIONS.

Tralee.—In this competition for a Carnegie free library and technical schools at Tralee, Ireland, the first premium of 20*l.* has been awarded to Mr. J. Clarke, architect, Liverpool, while the other premium of 10*l.* goes to Messrs. Webb & O'Callaghan, Dublin. Mr. G. C. Ashlin, R.H.A., acted as assessor for the twenty-three designs submitted.

Wood Green.—In a competition limited to fifteen selected architects, for public baths for the Wood Green (Middlesex) District Council, the first premium of fifty guineas has been awarded to Mr. Harold Burgess, the second of twenty-five guineas to Mr. E. Harding Payne, and the third of fifteen guineas to Messrs. F. J. & F. D. Smith.

Correspondence.

[The Editor will not be responsible for the opinions expressed by Correspondents.]

R.I.B.A. Conditions for Building Contracts.

SIR,—A misprint has been discovered in Clause 30 of the Revised Form of Agreement and Schedule of Conditions for Building Contracts which has been issued from the Royal Institute since October 14, 1909. If all those who have purchased copies of the Form since that date will kindly return them to me, I will at once send them corrected copies. IAN MACALISTER, Secretary, R.I.B.A.

December 28, 1909.

Precautions Against Fire.

SIR,—The serious fire at Clapham Junction, resulting in loss of life, has again drawn the attention of the public to the very real danger incurred by the use of large quantities of inflammable material for window displays, bazaars, &c.

That easily ignited material cotton wool could, and should, be entirely replaced by asbestos wool, which is now produced to equal cotton wool in effect, whilst being absolutely non-inflammable.

Again, all woodwork and drapery should be either impregnated with solution or coated with fireproof paint.

The lessons to be learnt from the fire at the Paris bazaar appear to have been forgotten, although the calamity itself is still remembered as an event, and it would appear to be absolutely necessary that the authorities should issue more stringent instructions and supervise the arrangements made for these displays, bringing them into line with theatres, music-halls and other places of public resort.—I am, sir, yours truly,

December 23, 1909. FIRE PREVENTION.

GENERAL.

The Arbroath Town Council have received an offer from His Majesty's Office of Works to take over the Abbot's House in connection with the Abbey ruins and keep it in a state of preservation. Hitherto the Town Council have received a considerable rental for the Abbot's House, which has been long occupied by an Arbroath family. The Council have remitted to the property committee to consider what should be done in the matter, and whether a sum of money should not be asked from the Office of Works before parting with the building.

The London County Council on November 16 decided that tenders should be invited from selected firms for taking out quantities for the first section of the new county hall, and that tenderers should compete on a time basis for the completion of the work. The establishment committee now ask that they be authorised, on behalf of the Council, to deal during the Christmas recess with the tenders received.

Lancaster's new town hall, presented to the borough by Lord Ashton, was opened by his lordship on Monday last, when a gold key was presented by Mr. F. Dare Clapham, who has superintended the works since the death of his partner, Mr. E. W. Mountford.

Mr. W. T. Oldrieve, H.M. Office of Works, has intimated to the Corporation of Edinburgh that he has been instructed by the Board of Works to state that they are very willing to do what is in their power to prevent the destruction of the old city wall at the Royal Scottish Museum in Edinburgh.

Messrs. Bruce & Hay, architects, have been appointed architects for a new school about to be erected by the Bothwell School Board, N.B.

The Margate Town Council by a majority of two have approved a scheme for improving the front, by dealing with the unfinished kursaal, at an estimated cost of 46,000*l.*

The Dean of Winchester has received a donation of 300 guineas to the Winchester Cathedral Preservation Fund from the Mercers' Company, in addition to their previous gifts of 250*l.* and 1,000*l.*

Messrs. Heeley & Peart, of Birmingham, recently submitted plans to the Newport Town Council, which were passed last week, for new works to be erected on the Somerton estate on the east side of the town. The works will be for the manufacture of light iron goods, and will commence with about 200 hands.

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The Contract Reporter.

to The Architect.

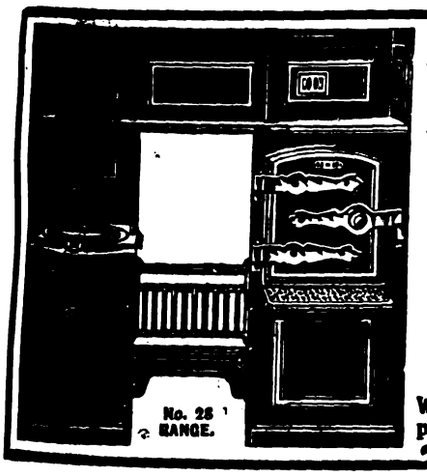
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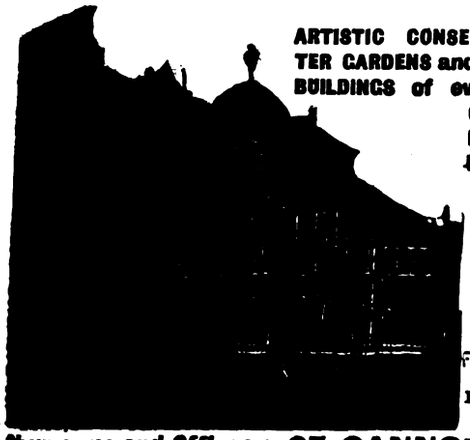
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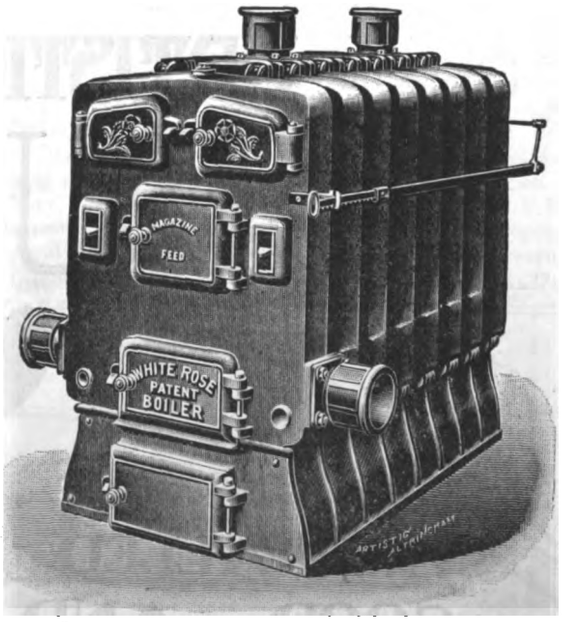
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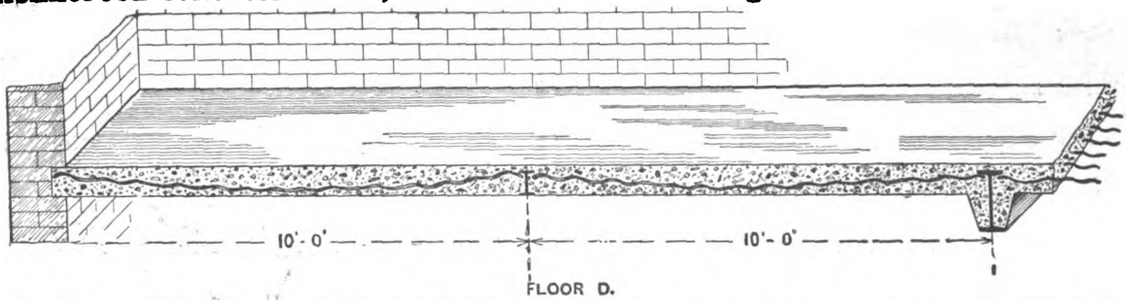
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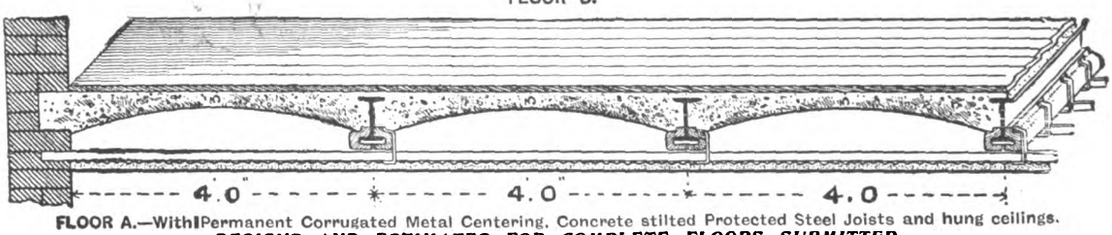
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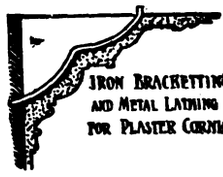




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FRIDAY, JULY 2, 1909.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

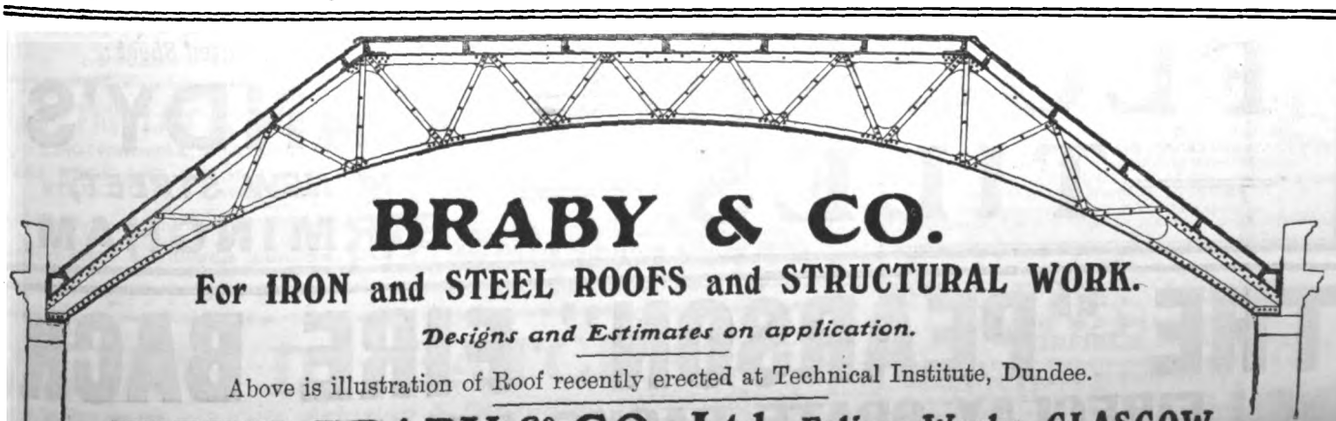
BURSLEM.—July 17.—For new public buildings. The author of the design placed first by the assessor will carry out the work. The architects placed second and third will receive premiums of 100*l.* and 50*l.* respectively. Deposit 2*l.* 2*s.* Mr. F. Bettany, borough surveyor, Burslem.

DEPTFORD.—Sept. 1.—The Metropolitan Borough Council of Deptford invite designs for a branch library at New Cross, S.E. Premiums of 50 guineas, 25 guineas and 10 guineas will be awarded. Assessor, Mr. J. S. Gibson, V.P.R.I.B.A. Deposit 1*l.* 1*s.* Competition is limited to architects practising in the city or county of London. Mr. Vivian Orchard, Town Clerk, Town Hall, New Cross Road, S.E.

GLASGOW.—July 31.—The patrons of the Royal Incorporation of Hutchesons' Hospital invite designs for laying out for feuing and building about 195 acres of their lands of Thornliebank, Eastwood. Premiums of 100*l.*, 75*l.*, 50*l.* and 25*l.* will be awarded. Deposit 3*l.* 3*s.* Messrs. Hill & Hoggan, 194 Ingram Street, Glasgow.

GRIMSBY.—July 30.—For the extension of the town hall, at an estimated cost of 26,000*l.* Premiums of 250*l.*, 150*l.* and 100*l.* will be awarded. An eminent architect will act as assessor in conjunction with the borough engineer. Deposit 2*l.* Apply to Mr. H. Gilbert Whyatt, A.M.I.C.E., borough engineer, Town Hall, Grimsby.

READING.—July 31.—The Berkshire County Council invite designs for offices, committee rooms, &c., on the Forbury, Reading. Mr. Mervyn Macartney, F.R.I.B.A., assessor. Premiums of 100*l.*, 75*l.*, and 50*l.* Deposit 1*l.* 1*s.* Apply to Mr. J. Fred Hawkins, county surveyor, Bank Chambers, Cross Street, Reading.



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STOKE-UPON-TRENT.—July 9.—For additions to the town hall, including hall to seat 3,000 people, and police court. Premiums of 100*l.* and 50*l.* for designs placed second and third. Mr. J. B. Ashwell, town clerk, Town Hall, Stoke-upon-Trent.

WHITBY.—July 30.—The North Riding of Yorkshire County Council education committee invite designs for a secondary school. Mr. Paul Waterhouse, assessor. Apply to the Secretary, Education Offices, County Hall, Northallerton.

WOOD GREEN.—July 9.—For the erection of public baths at a cost of 8,000*l.* Premiums of 50, 25 and 15 guineas. Mr. A. Hessell Tiltman, F.R.I.B.A., assessor. Architects should send particulars of baths recently designed by them to Mr. W. P. Harding, clerk, Town Hall, Wood Green. See advertisement.

CONTRACTS OPEN.

ALLERTON BYWATER.—July 8.—The West Riding education committee invite whole or separate tenders for Allerton Bywater, Lock Lane provided school, alteration and repairs (builder and joiner). West Riding Architect, County Hall, Wakefield.

ASHLEY.—July 12. For erection of an additional classroom for fifty children and a cloakroom at Ashley Council school, Hants. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

BELFAST.—For erection and completion of a theatre at the corner of Grosvenor Street and Durdam Street. Deposit 1*l.* 1*s.* Messrs. J. D. Swanston & Syme, architects, Kirkcaldy, N.B.

BERKELEY.—July 30.—For erection of an elementary school at Berkeley, Gloucestershire. Deposit 2*l.* 2*s.* Send names by July 10 to Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

BICESTER.—July 12.—For the construction of the new cattle market as follows:—Contract No. 1—Buildings, roads, drainage and concreting. Contract No. 2—Constructional ironwork for cattle, sheep and pig pens. Deposit 3*l.* 3*s.* each. Mr. Richard Parker, surveyor, Market Hill, Bicester, Oxon.

BLACKBURN.—July 5.—For erection of the higher elementary school and swimming bath on Blakey Moor. Deposit 1*l.* 1*s.* Messrs. Briggs & Wolstenholme and Messrs. Stones and Stones, joint architects, Richmond Terrace, Blackburn.

BLACKBURN.—July 6.—For repairing the stone cornice of the Town Hall, and for reroofing No. 2 Market House. Mr. William Stubbs, A.M.I.C.E., borough engineer, Municipal Offices, Blackburn.

BOLTON.—July 28.—For erection of (*a*) the Astley Bridge and Great Lever branch libraries. Messrs Bradshaw & Gass, F.R.I.B.A., architects, 19 Silverwell Street, Bolton. (*b*) The Halliwell branch library. Messrs. Henderson & Brown, architects, Fold Street, Bolton.

BRIGHTON.—July 6.—For erection of a residence at the workhouse, Elm Grove, for the assistant medical officer. Messrs. Hawker & Clover, architects for the Guardians, 9 North Street, Brighton.

BURGHILL.—July 7.—For additions to the Council school at Burghill, near Hereford. Deposit 2*l.* 2*s.* The County Surveyor's Office, Shirehall, Hereford.

BURY.—July 10.—For the erection of a secondary school in Westminster Street. Deposit 2*l.* Mr. J. T. Halliday, A.R.I.B.A., 14 John Dalton Street, Manchester.

CARLISLE.—For erection of warehouses in Crown Street and Collier Lane. Deposit 1*l.* 1*s.* Send names to Mr. H. Foxall, architect, 54 Lowther Street, Carlisle.

CRICKLADE AND SWINDON.—July 12.—For internal and external renovations to Cricklade, Old Swindon and New Swindon police stations, Wilts. Mr. J. George Powell, county architect and surveyor, County Offices, Trowbridge.

DARWEN.—For various alterations required at Culvert school. Messrs. Sames & Green, architects, Knott Street, Darwen.

DONCASTER.—July 7.—For erection of business premises in Trafford Street. Mr. F. Norman D. Masters, M.A., Bank Chambers, Scot Lane, Doncaster.

DURHAM.—July 20.—The County Council invite sole tenders (1) for new higher elementary school and pupil teacher centre at Tanfield Lea, new Council school at Bloemfontein, and (2) alterations at Willington and Collierley

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Council schools. (1) Mr. W. Rushworth, Shire Hall, Durham; (2) Mr. F. E. Coates, Shire Hall, Durham.

EDINBURGH.—July 7.—For building a sluice-keeper's cottage at Fairmilehead. Deposit 2*l*. Mr. W. A. Tait, C.E., Edinburgh and District Water Trustees, 72A George Street, Edinburgh.

ELLAND.—July 12.—For the various works (painting excepted) required in erection of a detached villa at Hullen Edge, Elland, Yorks. Messrs. Richard Horsfall & Son, architects, 22A Commercial Street, Halifax.

FEATHERSTONE.—July 8.—For the following works:—Featherstone new school (builder, joiner, slater, plasterer, plumber, painter). Deposit 1*l*. each. The West Riding Architect, County Hall, Wakefield.

GILLINGHAM.—July 10.—For extending Byron Road and Richmond Road Council schools, Gillingham, Kent. Mr. J. L. Redfern, A.R.I.B.A., borough surveyor (surveyor to the education committee), Council Offices, Gardiner Street, Gillingham, Kent. Deposit 10*s*. 6*d*. each contract with Mr. Andrew Johns, education secretary, 4 Gardiner Street, Gillingham.

GRANTHAM.—July 14.—For erection of a girls' secondary school. Deposit 1*l*. 1*s*. Mr. H. H. Dunn, A.R.I.B.A., Silver Street, Lincoln.

GRIMSBY.—July 17.—For shop, warehouse, &c., in Maude Street or Cartergate. Mr. R. A. Robertson, architect and surveyor, 3 Flottergate, Grimsby.

GUILDFORD.—July 12.—For the construction of the superstructural buildings (upon foundations already completed) over the refuse-destructor plant and machinery at Bellfields, Stoke. Deposit 2*l*. 2*s*. Mr. C. G. Mason, A.M.I.C.E., borough engineer and surveyor, Tuns Gate, Guildford.

HAINE.—July 13.—For alterations and additions at the receiving block, Isle of Thanet Joint Hospital, Haine, near Ramsgate. Deposit 3*l*. 3*s*. Mr. H. Bertram Langham, Board's architect, Bank Chambers, Broadstairs.

HALIFAX.—July 9.—For converting warehouse into two lock-up shops in Cheapside, Halifax. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

HANDSWORTH.—July 19.—For erection of a chapel and entrance lodge at the cemetery at the Leveretts, Handsworth, Staffs. Deposit 3*l*. 3*s*. Send names by July 6 to Mr. Ernest Ward, clerk, the Council House, Handsworth.

HECKINGTON.—July 6.—For erection of farm buildings at Heckington, Lincs. Mr. Jesse Clare, county architect, Sleaford.

HULL.—July 9.—For steel roof work required in an extension of the Madely Street baths, for the Corporation. The work consists of eight elliptical principals of about 74 feet span, together with purlins, lanterns, &c., the total weight being approximately forty tons. Plan 2*s*. 6*d*. Deposit 1*l*. Mr. A. E. White, M.I.C.E., city engineer, Town Hall, Hull.

IRELAND.—July 6.—For repairs and improvements in the workhouse infirmary and for the heating of the strong closet in the Union register office, Enniskillen. Mr. Richey Wilson, clerk, Workhouse, Enniskillen.

IRELAND.—July 14.—For repairs, &c., to the surgeon's house, Longford Infirmary. Mr. S. Wilson, registrar, Medical Hall, Longford.

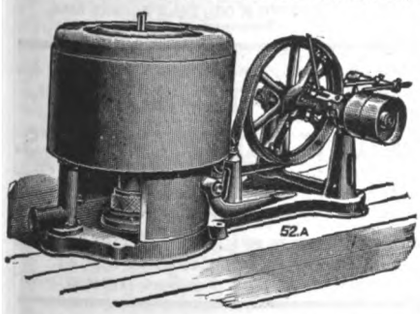
IRELAND.—July 14.—For erection of a dispensary and caretaker's residence at Carrickfergus, for the Guardians of Larne Union. Mr. W. D. R. Taggart, architect, 51 and 52 Scottish Provident Buildings, 2 Wellington Place, Belfast.

IRELAND.—July 17.—For providing apartments for the Sisters of Mercy in the Castlerea workhouse, and for certain structural alterations incident thereto. Messrs. W. H. Bryne & Son, architects, 20 Suffolk Street, Dublin.

KING'S NORTON.—July 3.—For erection of Council schools as follow, for the King's Norton and Northfield Urban District Council education committee:—(*a*) Cotteridge infants' school, for 400 children. Mr. J. P. Osborne, architect, 95 Colmore Row, Birmingham. (*b*) Stirchley Street, infants' school, for 400 children. Mr. W. A. Harvey, architect, 5 Bennett's Hill, Birmingham. Deposit 1*l*. 1*s*. Send names to Mr. John F. Moore, secretary, Education Offices, King's Norton.

KNOTTINGLEY.—July 7.—For the erection of a school. Messrs. Tennant & Collins, architects, Pontefract. Deposit 1*l*. with the West Riding Treasurer, County Hall, Wakefield.

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LEEK (STAFFS).—July 5.—For providing and laying a maple floor, &c., in the Concert Hall at the Town Hall, Market Street. Mr. W. E. Beacham, C.E., surveyor, Town Hall, Leek.

LEICESTER.—July 12.—For erection of public baths in Knighton Fields Road West. Deposit 1*l.* 1*s.* Mr. Arthur H. Hind, A.R.I.B.A., 3 Grey Friars, Leicester.

LONDON.—July 7.—For repairs to slate roofs and chimney stacks, &c., at the South-Western Fever Hospital, Landor Road, Stockwell, S.W., for the Metropolitan Asylums Board. Deposit 1*l.* Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief. The Office of the Board, Embankment, E.C.

LONDON.—July 12.—The Tottenham education committee invite tenders for summer repairs to various schools in their district. Separate tenders are invited for repairs to playgrounds. Deposit 1*l.* 1*s.* Mr. W. H. Prescott, A.M.I.C.A., surveyor to the committee, Council Offices, Tottenham.

LONDON.—July 19.—For erection of eight cottages in Mill Road, Merton Abbey Estate, High Street, Merton, S.W. Mr. Henry R. G. S. Smallman, A.R.I.B.A., 8 Queen Street, Cheapside, E.C.

MANCHESTER.—July 12.—For erection of the Moseley Road Municipal school, Fallowfield. Deposit 2*l.* 2*s.* The Education Offices, Deansgate, Manchester.

NEWBIGGIN-BY-SEA.—July 13.—For extending the Newbiggin-by-the-Sea Council school, Northumberland. Deposit 1*l.* 1*s.* Send names to Mr. C. Williams, secretary to the education committee, the Moot Hall, Newcastle-on-Tyne.

NORTHFLEET.—July 13.—For erection of a small brick-built urinal on the Ebbs Fleet pleasure ground, for the Northfleet Urban District Council. Mr. J. A. Mitchell, district surveyor, Council Offices, The Hill, Northfleet, Kent.

PEAKDALE.—July 8.—For erection of infants' school and additions to Peakdale Council school, near Buxton, Derbyshire. Deposit 1*l.* 1*s.* Send names to Mr. George E. Garlick, architect, Quadrant Chambers, Buxton.

ROMFORD.—July 7.—For enlargements and alterations to the Dagenham elementary schools. Deposit 2*l.* 2*s.* Send names to Mr. Joseph Aylott, architect, 25 Ludgate Hill, E.C.

ROTHERHAM.—July 5.—For erection of four houses at Parkgate. Mr. J. Platts, architect, High Street, Rotherham.

ST. ALBANS.—July 15.—The visiting committee of the Middlesex County Asylum, Napsbury, St. Albans, Herts, invite names of contractors willing to tender for alterations and additions to accommodate 582 additional patients at the asylum. Offers to undertake a portion of the work only will not be entertained. A selection will be made, and the selected firms will then be invited to tender. Mr. Rowland Plumbe, F.R.I.B.A., architect, 13 Fitzroy Square, London, W.

SALFORD.—July 5.—For alteration and addition to buildings at the electricity works, Frederick Road, Pendleton. Deposit 1*l.* 1*s.* Mr. Victor A. H. M'Cowen, M.I.E.E., borough electrical engineer, Frederick Road, Pendleton.

SCOTLAND.—July 7.—For the excavator, brick and mason, iron and smith, carpenter and joiner, glazier, plumber, plasterer, slater, harling and asphalte works of tenements of shops and dwelling houses to be erected in Hope Street, Inverkeithing, for the Rosyth Building and Estates Co., Ltd. Deposit 1*l.* 1*s.* Mr. William Williamson, F.R.I.B.A., Kirkcaldy, or to Mr. A. C. Philp, C.A., secretary, 143 High Street, Dunfermline.

SCOTLAND.—July 10.—For mason, joiner, plumber, plasterer, slater, asphalte work, painter work, heating and electric lighting, &c., of Lauder technical school extension. Mr. D. Gorrie, clerk to the School Board, 104 High Street, Dunfermline.

SHERBURN.—July 8.—For alterations and additions to the Sherburn Hospital, Durham. Deposit 1*l.* 1*s.* Messrs. Joseph Potts & Son, architects and surveyors, 57 John Street, Sunderland.

SHOOTER'S HILL.—July 16.—For the construction of a water tower and other subservient works. Deposit 10*l.* with the Accountant, Metropolitan Water Board Offices, Savoy Court, Strand, W.C.

SKELMANTHORPE (YORKS).—July 9.—For builder, plumber, joiner, and asphalter works in alterations to Skel-

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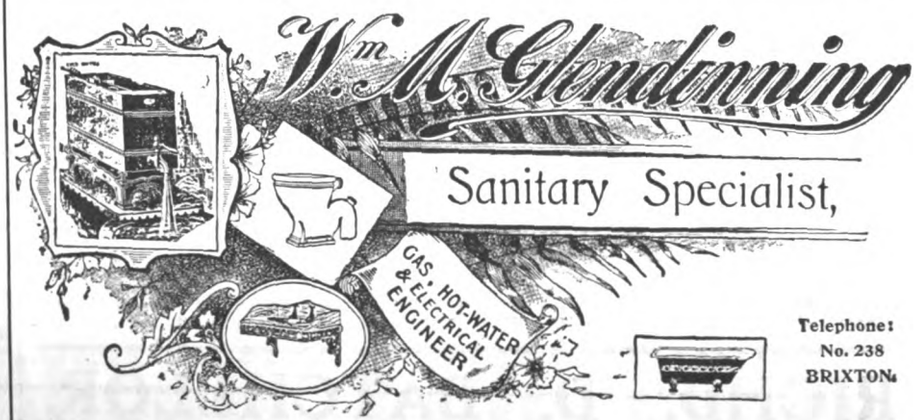
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manthorpe Provided mixed school. Mr. William Wood, divisional clerk, Penistone.

SMARDEN.—July 14.—For general repairs at the Smarden Council schools, Kent. Mr. E. W. Buss, West End, Smarden, S.O.

SOUTHAMPTON.—July 7.—For the supply and laying of a maple wood floor for the Royal pier pavilion. Deposit 1*l.* Mr. E. Cooper Poole, A.M.I.C.E., engineer, Town Quay, Southampton.

TIVERTON.—July 7.—For erection and completion of new school building for the Governors of the Middle Schools and School of Art. Deposit 2*l.* 2*s.* Mr. E. S. Perkin, director, School of Art, Fore Street, Tiverton.

WALES.—July 5.—For building workmen's hall, institute, and free library, at Cwmbach, Aberdare. Mr. Thomas Roderick, architect, Ashbrook House, Clifton Street, Aberdare.

WALES.—July 6.—For the re-roofing and sundry other works required to be done at Ebenezer C.M. Church, Clydach. Mr. B. J. Francis, architect, Abergavenny.

WALES.—July 6.—For erection of a school to accommodate 260 infants at Pontllanfraith, Mon. Deposit 2*l.* 2*s.* Mr. John Bain, architect, County Council Offices, Newport.

WALES.—July 7.—For erection of a vestry, with conveniences and boundary walls, at Ystrad Mynach. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

WALES.—July 9.—For erection of thirty-six cottages at Pontycymmer, for the Gwynfryn Building Club. Deposit 1*l.* 1*s.* Mr. C. Scoble, Ffaldau Collieries Co., Ltd., Exchange Buildings, Cardiff.

WALES.—July 10.—For erection of two pairs of semi-detached villas at The Walk, Merthyr Tydfil. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

WALES.—July 12.—For erection of boundary walls to the County school, Merthyr Tydfil. The Deputy Surveyor, Town Hall, Merthyr Tydfil.

WALES.—July 12.—The Ebbw Vale education committee invite tenders (by schedule of prices) for jobbing works to the schools for twelve months. Deposit 10*s.* 6*d.* Mr. Henry Waters, architect, Market Chambers, Ebbw Vale.

WALES.—July 17.—For renovating Penuel Baptist Chapel, Priory Street, Carmarthen. Messrs. George Morgan & Son, F.R.I.B.A., architects, Carmarthen.

WALES.—July 27.—For erection of six houses at Trehafod. Mr. Edward Rees, architect and surveyor, Alexandra Chambers, Pontypridd.

WHALEY BRIDGE.—July 10.—For erection of joint Council schools at Whaley Bridge, Derbyshire, to accommodate 336 children (mixed and infants), with cookery and manual instruction rooms. Deposit 1*l.* 1*s.* Mr. George H. Widdows, A.R.I.B.A., architect to the committee, County Education Office, St. Mary's Gate, Derby.

WINCHESTER.—July 19.—For the extension of Post Office. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

WOOLER.—July 10.—For alterations and additions to Wooler C.E. school premises, Northumberland. Mr. M. Temple Wilson, M.R.S.I., architect and surveyor, Alnwick.

THE Old Bath preservation committee have issued the first two pamphlets of a proposed series which will deal with Bath, its architecture, historical associations and objects of interest. The Association contemplate "(*a*) Aiding the citizens to maintain their valuable architectural heritage; (*b*) directing attention to places and objects worthy to be preserved; (*c*) fostering a feeling of pride in the historical, literary and artistic associations that cling around the city." Pamphlet No. 1 recounts the history of the movement for the defence of Bath Street with its colonnades against the threatened demolition. Pamphlet No. 2 is described as "The Official Statement of the Bath Corporation examined, criticised and refuted in every important particular."

AN experiment which may lead to the adoption of electric light in the centre of Birmingham is to be conducted by the Electric Supply Department of the Corporation. There are to be placed in Corporation Street four electric arc lamps of a new type, and if, after experiments, the public works committee decide that they are a more effective means of lighting than the present incandescent lamps, a proposal may eventuate of an extended system of electric lighting.

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TENDERS.

BURSLEM.

For erection of Central schools, Moorland Road. Messrs. A. R. WOOD & SON, architects, Burslem.

Contract No. 1.—Elementary Block.

J. Cooke	£8,500 0 0
Wilson & Son	8,370 0 0
Gallimore	8,219 0 0
Wilton	8,211 0 0
Godwin	7,924 0 0
Bennett Bros.	7,900 0 0
W. Grant & Son	7,545 0 0
W. Cooke	7,505 0 0
J. GRANT, Stoke-on-Trent (*accepted*)	7,503 0 0

Contract No. 2.—Manual Training and Cookery.

Gallimore	£6,576 0 0
Wilson & Son	6,453 0 0
W. Cooke	6,143 0 0
Godwin	6,115 0 0
Wilton	6,055 0 0
W. Grant & Son	5,955 0 0
Bennett Bros.	5,900 0 0
J. GRANT (*accepted*)	5,585 0 0
J. Cooke	5,500 0 0

CHURWELL (YORKS).

For the various works required in erection of warehouse, &c., Lane Side mills, Churwell. Mr. T. A. BUTTERY, F.I.A.S., architect, Queen Street, Morley, and 1 Basinghall Square, Leeds.

Accepted tenders.

W. & H. Sykes, mason	£1,560 0 0
Clegg & Sons, joiner	896 0 0
Crossley & Son, Birstall, plasterer	180 0 0
Kellett, slater	159 0 0
Stakes, plumber	82 10 0
Bagshaw & Sons, Batley, ironfounder	65 0 0

DUNTON GREEN.

For erecting a Council school to accommodate 250, at Dunton Green, near Sevenoaks, for the Kent Education Committee. Mr. W. H. ROBINSON, M.S.A. architect.

Edwards	£3,823 0 0
Honess	3,484 0 0
Taylor	3,170 0 0
Ballard & Co.	3,169 0 0
Gregory	3,110 0 0
Godden & Son	3,065 0 0
Blay	3,057 0 0
Jacobs	3,024 14 0
Corben & Son	2,998 0 0
Thomas & Edge	2,992 0 0
Durtnell & Sons	2,950 0 0
Hayward & Paramor	2,898 0 0
Somerford & Son	2,891 0 0
Strange & Son	2,870 0 0
Elmore & Son	2,850 0 0
West Bros.	2,845 0 0
Lowe	2,844 0 0
G. E. Wallis & Sons	2,835 0 0
Banks	2,827 0 0
Spencer, Santo & Co.	2,803 0 0
J. & M. Patrick	2,778 0 0
Pethick Bros.	2,777 0 0
Walter Wallis	2,775 0 0
Davis & Leaney	2,758 0 0
Webster & Son	2,730 0 0
E. Wallis	2,670 0 0
Podger & Son, Bromley (*recommended*)	2,569 0 0

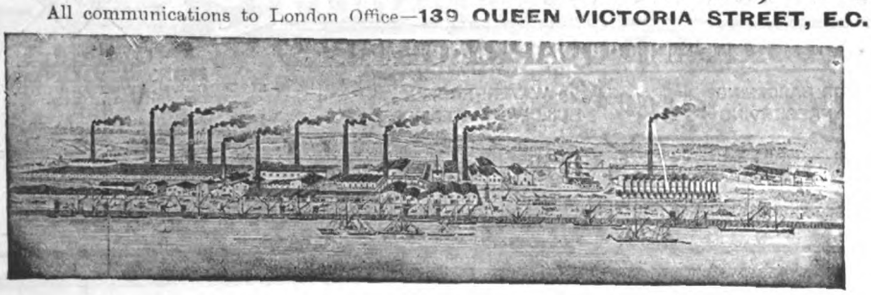
EAST KIRKBY (NOTTS).

For slaughter-houses. Mr. W. H. WOODS, architect, Long Eaton. Quantities by the architect.

Tate & Son	£1,389 19 4
Hoole	1,365 0 0
Stubbings & Fell	1,360 0 0
Coleman & Blackburn	1,350 10 0
Messom	1,320 0 0
Evans Bros.	1,305 0 0
BAINS, East Kirkby (*accepted*)	1,295 0 0

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EAST STONEHOUSE (DEVON).

For laying about 4,900 yards of wood paving in Union and Edgcumbe Streets, for the East Stonehouse Urban District Council. Mr. C. H. TROUNCE, surveyor.

Jarrah.

Crockerell	£6,088 0 0
Roberts	5,950 0 0
Macdonald	5,851 0 0
W. C. Shaddock	5,811 13 2
Griffiths & Co.	5,681 0 0
J. Shaddock	5,590 0 0
Pethick Bros.	5,519 0 0
T. Shaddock	5,467 0 0
Doney	5,425 0 0
Carwithen	5,383 0 0
Acme Wood Paving Co.	5,375 10 4

Deal.

Roberts	£4,898 0 0
Crockerell	4,637 0 0
Griffiths & Co.	4,517 5 0
Pethick Bros.	4,389 0 0
Carwithen	4,376 0 0
Acme Wood Paving Co.	4,330 0 0
W. C. Shaddock	4,247 8 2
Doney	4,205 0 0
J. SHADDOCK, Plymouth (*accepted*)	3,976 11 0

EDINBURGH.

For the various works in connection with the new offices for the United Free Church of Scotland, in George Street. Messrs. SYDNEY MITCHELL & WILSON, architects, Edinburgh.

Accepted tenders.

Thorburn & Son, Edinburgh, mason	£10,324 0 0
Rome & Co., Glasgow, plasterer	4,545 0 0
Finlayson & Son, Leith, joiner	4,300 0 0
Allan & Sons, Edinburgh, tiles and marble	4,131 0 0
Steel & Wilson, Glasgow, plumber	1,980 0 0
Cunningham & Co., Edinburgh, glazier	420 0 0
Brand & Son, Arbroath, slater	122 7 5

HEBBURN.

For street works, for the Urban District Council.

Thornton & Co.	£2,703 9 9
Bunch	2,284 6 0
Young	2,268 10 3
Hollings	2,228 11 10
Glen	2,174 5 10
RULE (*accepted*)	2,145 5 0

HORSELL.

For carrying out the church enlargement.

WHEELER BROS., Reading (*accepted*) . £1,990 0 0

LONDON.

For the execution of roadwork and platelaying, exclusive of the supply of rails and special trackwork, in connection with the construction, on the underground conduit system of electric traction, of the authorised tramways along the Victoria Embankment, east of John Carpenter Street, Blackfriars Road, and Southwark Street, for the London County Council.

Mowlem & Co.	£14,707 0 0
Manders	13,598 13 10
Coles	12,945 5 5
Dick, Kerr & Co.	12,055 4 5
Chief Engineer's estimate	11,953 8 4
Brebner & Co., Edinburgh (*recommended*)	11,420 6 0

For the supply and erection of a light suspension bridge, including the construction of abutments, &c., to the island in the boating lake at Victoria Park.

Handyside & Co.	£424 0 0
The General Iron Foundry Co.	340 0 0
Wilkins Wire Rope Co.	336 0 0
Heenan & Froude	260 0 0
Henderson & Co.	242 10 0
Alnwick Foundry and Engineering Co.	219 0 0
Goddard, Massey & Warner	214 14 1
Kirk & Randall	207 0 0
Rowell & Co. (*recommended*)	201 0 0
Sweet	200 0 0
Muirhead & Co. *	198 0 0

* Not to specification.



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LONDON—*continued.*

For the erection of a manual training centre for forty boys on the Park Walk site, Chelsea, for the L.C.C.

Lapthorne & Co.	£1,265	0	0
Roberts & Co.	1,264	0	0
J. & W. Drake	1,238	7	6
Bendon	1,219	3	3
Peattie	1,162	0	10
Lole & Co.	1,159	11	10
Lathey Bros.	1,157	0	0
Triggs	1,063	0	0
Soole & Son (*recommended*)	1,052	14	10
Architect's estimate (education)	1,136	0	0

For cleaning and painting the Risinghill Street school, Finsbury.

Hawkins & Sons	£638	0	0
Hornett	624	0	0
H. & E. Lea	596	0	0
Reason	589	0	0
Peattie	584	0	0
Kearley (*recommended*)	557	0	0

For cleaning and painting work at the following L.C.C. schools. Contracts to be sealed.

The Hither Green, Lewisham.

Kazak	£235	0	0

The Portland, Marylebone.

Peattie & Sons	225	0	0

Bell Street, Marylebone.

Peattie & Sons	410	0	0

The Acland, St. Pancras.

Langsford	312	0	0

For repairing, cleaning and painting the interior of SS. James's and Peter's school, Soho. Mr. E. R. ROBSON, F.S.A., architect.

Dunn	£242	0	0
Lea	198	0	0
Daniel	174	0	0
Parkinson & Son	173	0	0
Streek & Co.	168	8	0

NEWBURY.

For the erection of offices on the site of the old town hall. The Borough Surveyor.

Bance	£2,678	0	0
H. Elms	2,610	0	0
Chivers	2,600	0	0
Hoskings Bros.	2,598	0	0
Houghton & Hitchman	2,598	0	0
G. Elms	2,567	0	0
Plumb	2,460	0	0

Mr. Plumb was asked to give an amended tender.

PLUMB, Reading (*accepted*)	1,960	0	0

ST. CUTHBERT WITHOUT.

For alterations and additions to the sewage disposal works in the parish of St. Cuthbert Without, Somerset. Mr. A. P. I. COTTERELL, M.I.C.E., engineer, Bristol.

J. & T. Binns	£4,583	17	4
Jesty & Baker	4,188	17	8
Brebner & Co.	4,044	0	0
Cowlin & Son	3,515	0	0
Pollard & Co.	3,437	0	0
Wimpey	3,292	0	0
Chamberlain	3,200	0	0
Cooper & Co.	3,152	18	9
SMALL, Taunton (*accepted*)	3,110	0	0

STOKE-UPON-TRENT.

For the electric wiring of a portion of the cottage homes, comprising nursery, receiving home, &c., for the Guardians.

Pullan	£554	0	0
Meadows	452	0	9
Blackburn, Starling & Co.	400	0	0
Barnett & Soans	391	14	3
Barnett & Hyde	388	2	0
Johnson & Phillips	383	0	0
Russell, Bridge & Co.	378	0	0
Teeton	365	0	0
Terry	363	10	0
Evans & Co.	356	0	0
DISTRICT ELECTRIC CO., Wolverhampton (*accepted*)	334	0	0

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VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON.—WEST CENTRAL COURT—PRINCIPAL ENTRANCE—INTERIOR OF ENTRANCE HALL.

SOUTHAMPTON.

For additions to St. Michael's House.

JENKINS & Co. (*accepted*)	£2,964 0 0

SWANSEA.

For additions and alterations to the Principal Secondary Boys' school, Dynevor Place. Mr. G. E. T. LAURENCE, A.R.I.B.A., architect, 22 Buckingham Street, Adelphi, W.C.

G. Davies	£4,039 5 3
D. Davies	3,752 17 0
Lloyd Bros.	3,603 2 5
Billings	3,600 0 0
Jenkins	3,566 0 0
Bennett Bros.	3,500 0 0
J. & F. Weaver	3,400 0 0
RICHARDS, Swansea (*accepted*)	3,150 0 0

TUNBRIDGE WELLS.

For forming and shaping roads and laying sewers, &c., at Southwood building estate, Rusthall. Messrs. RICHARDSON & DUTTSON, surveyors, Tunbridge Wells.

Genton	£2,596 13 0
Williams	2,490 0 0
Free & Sons	2,094 15 10
Woodham & Sons	2,057 0 0
Pearce	1,970 0 0
Wheeler & Co.	1,892 0 0
Swaker	1,677 0 0
Misken	1,620 0 0
Watson	1,478 7 8
TRUEMAN, Swanley Junction (*accepted*)	1,299 0 0

TIPTON.

For erection of buildings and machinery in connection with the proposed plant for the making of tarred macadam. Mr. W. H. JUKES, M.E., engineer and surveyor.

Sisnian	£320 0 0
Meredith	285 0 0
Kendrick	256 17 0
EDWARDS, Dudley (*accepted*)	245 0 0
Engineer and surveyor's estimate	254 0 0

THORNTON HEATH.

For the erection of Thornton Heath Beulah Baptist Church. Messrs. G. BAINES & SON, architects, 5 Clement's Inn, Strand, W.C.

Higgs & Hill	£4,284 0 0
Brightman & Son	3,979 0 0
Mattock Bros.	3,857 0 0
Holliday & Greenwood	3,790 0 0
Minter	3,752 0 0
J. & C. Bowyer	3,747 0 0
Smith & Sons	3,727 0 0
Patman & Fotheringham	3,700 0 0
Knight & Son	3,679 0 0
Lawrence & Son	3,677 0 0
Jerram	3,652 0 0
Akers & Co.	3,633 0 0
BATTLEY, SONS & HOLNESS (*accepted*)	3,587 0 0

WALES.

For alterations and additions to Cadoxton infants' school. Mr. G. A. BIRKENHEAD, architect, Cardiff and Barry.

Evans	£2,856 11 7
Davis & Sons	2,700 0 0
Symonds & Sons	2,652 0 0
Gibby & Cleak	2,648 2 2
Rendell	2,630 15 8
DAVIES & HOWELL, Cardiff (*accepted*)	2,598 0 0

For carrying out a housing scheme at Briton Ferry.

WATERS, Briton Ferry (*accepted*)	£9,555 0 0



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VICTORIA AND ALBERT MUSEUM,
Also in ROYAL MINT, SOMERSET HOUSE, ROYAL COLLEGE OF SCIENCE, &c., &c.

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WALES—*continued.*

For alterations and additions to Gibeon Chapel, Taibach, Port Talbot. Messrs. EVANS & JONES, architects, Port Talbot.

Cox	£1,960	0	0
Evans	1,762	15	10
J. Davies	1,750	0	0
W. P. & E. Williams	1,717	0	0
D. Davies & Sons	1,640	0	0
Nicholas	1,629	0	0
Maggs & Co.	1,439	0	0
W. WILLIAMS, Cardiff (*accepted*)	1,380	0	0

WALTHAMSTOW.

For the erection of a junior mixed department, Coppermill Road schools. Mr. H. PROSSER, M.S.A., architect. Quantities by Mr. G. T. G. WRIGHT, F.S.I., 3 Great Winchester Street, E.C.

Moss	£4,050	0	0
Nightingale	3,948	0	0
Spencer, Santo & Co.	3,813	0	0
Brown Bros.	3,698	0	0
Coxhead	3,697	0	0
Carter	3,651	0	0
Appleby & Sons	3,600	0	0
Maddison	3,556	0	0
Knight & Son	3,542	0	0
Lawrence & Son	3,540	0	0
Brand, Pettit & Co.	3,490	0	0
F. & A. Willmott	3,473	0	0
R. & E. Evans	3,469	0	0
HAMMOND & SON, Romford (*accepted*)	3,393	0	0

WROXHAM (NORFOLK).

For new residence. Messrs. MORGAN & BUCKINGHAM, architects, Norwich.

Hawes & Sons	£1,789	0	0
Gill & Son	1,257	0	0
Scarles Bros.	1,246	0	0
Troy	1,235	10	0
J. Young & Son	1,180	0	0
RICHES, Postwick (*accepted*)	1,109	0	0

TRADE NOTES.

MESSRS. THOMAS LAWRENCE & SONS, Bracknell, Berks, supplied the whole of the red facing bricks for both the inside and the outside of the memorial chapel at Millbank Hospital, which was opened by the King on June 23. Messrs. T. Lawrence & Sons have, moreover, supplied the whole of the best red facings for the other buildings erected at Millbank during the past few years.

THE proprietors of the *Furniture Record*, 14 City Road, E.C., have chartered the Clyde Shipping Company's steamer *Lizard* for the Naval Review on Tuesday, July 20. The tickets are 25*s.* each, inclusive of luncheon, tea, and rail, and the boat will start from Gallions Wharf, and a special train will convey the party from Liverpool Street to the wharf.

THE visitors to the Victoria and Albert Museum who become enamoured of the new interior arrangements are probably unconscious of the part played by the wall surface. This, however, is a very considerable one, and reflects great credit on the firms concerned who have produced such satisfactory colour effects. In the Tapestry Court, for example, the subdued green and ivory water paint is particularly successful; and this, despite the fact that the Rapidal Paint Company found the surface of a specially difficult nature. The firm have large experience in work of this kind for the same Rapidal Water Paint has been employed by the Office of Works on the Royal College of Science, the House of Commons, the Royal Mint, the G.P.O., &c.

THE Waring White Building Company, Ltd., have, we understand, received the contract for erecting the superstructure of the Birmingham Council House extension (architects, Messrs. H. V. Ashley & Winton Newman); and also for the new premises of the Automobile Club in Pall Mall (architects, Messrs. Mewès & Davis and Mr. E. Keynes Purchase).

THE Council of the Royal Sanitary Institute have appointed Mr. Henry Adams, M.Inst.C.E., F.S.I., &c., to represent the Institute at the conference which is being organised by the Engineering Standards Committee to consider the desirability of a standard being adopted for stoneware, fireclay and other similar pipes.



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BUILDING AND BUILDERS.

THE Tunbridge Wells Education Committee, in conjunction with the Kent Education Committee, propose to build at Combley Park a school for higher education at a cost of 10,000*l.*, to accommodate 200 girls.

THE Southampton Town Council have adopted plans prepared by the borough engineer for enlarging the refuse destructor at the wharf, by the provision of four additional cells and a steam boiler, at an estimated cost of 2,250*l.*

CARDIFF Technical Schools Committee have recommended to the Education Committee the desirability of providing an entirely new technical institute at an estimated cost of 40,000*l.*

AT Glasgow Trades' Council last week a deputation representing the building trade was appointed to wait upon the Corporation and lodge a complaint against delay in the completion of the new Mitchell Library. It was stated that many trades were idle because work was not being pushed forward as it ought to be. A report was submitted from the Parliamentary Bills Committee with reference to the House-Letting Bill. Among suggested amendments were that the Bill should apply to houses of 26*l.* and under, instead of 15*l.* as proposed, and should include all Scotland; also that lets should be limited to one month at the outset.

MR. BERTIE CREWE, architect, of 75-77 Shaftesbury Avenue, London, W., on behalf of Mr. Charles Boyle, of 48 Abingdon Villas, Kensington, London, W., is about to apply for authority to erect a theatre upon the piece of land with frontages to Shaftesbury Avenue, Broad Street, and Grape Street, in the Borough of Holborn.

THE National Association of Master House Painters and Decorators of England and Wales, of which Mr. James Puttrell, of Sheffield, is president this year, will hold their annual convention in Sheffield in September. The meetings commence on Monday, September 13. On the Tuesday morning Sir William Richmond, R.A., K.C.B., will formally open the exhibition at noon. Sir William has also promised to deliver a lecture in the evening on "Some Phases of Decorative Art."

VARIETIES.

THE Westminster City Council have deferred the proposal to repave Belgrave Square, at a cost of 11,345*l.*, till the next meeting, for the views of the rated occupiers to be ascertained as to whether wood or macadam should be used. It was stated that Belgrave Square is the largest in London, and its rateable value is higher than any other. The repaving of Carey Street is also to be deferred, in order not to interfere with the work of the Law Courts.

MR. P. C. COWAN, Chief Engineering Inspector of the Local Government Board, opened last week an inquiry touching the application of the Dublin Corporation for the Local Government Board's sanction of the following loans:—100,705*l.* for the purpose of extending the electric lighting mains and plant, 100,000*l.* for completing the main drainage system, 17,400*l.* for erecting working-class lodging-houses on a site at Inchicore, under the Housing of the Working Classes Acts; 10,632*l.* for completion of refuse destructor, &c.; 10,000*l.* for advances under the Small Dwellings Acquisition Act, 1899; 10,000*l.* for carrying out street-improvement works; 1,320*l.* for lighting Drumcondra and N.C.R. by electricity; and 1,006*l.* for private improvements expenses.

FOR the convenience of travellers to Belgium by the Harwich route the Great Eastern Railway Company have just placed on the Antwerp express train from Liverpool Street Station dining and breakfast cars, in which table d'hôte dinner and other refreshments are served on the down journey and table d'hôte breakfast on the up journey. In connection with the Aeronautical Exhibition to be held at Frankfort-on-Main, July 10 to October 10, through carriages will be run between the Hook of Holland and Frankfort.

SUBJECT to the Board of Trade reviving the order for the making of the line, the Middlesex County Council has agreed to proceed as soon as possible with the construction of the light railway from Ponder's End to Enfield Town, and has accepted a tender of Messrs. Dick, Kerr & Co. at an estimated cost of 45,500*l.* for the work.

AT the last meeting of the executive committee of the Swansea Harbour Trust it was agreed to build premises for the Customs at the King's Dock. Tenders were received for the electrical plant of the King's Dock, and orders for

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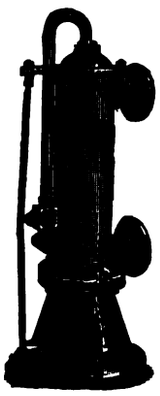
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portions of the plant were placed, but with regard to the major part it was decided that a sub-committee should report. It is estimated that the plant would cost nearly 20,000*l.*

THE WATKIN SWITCH.

THE patent Watkin switch must have been born to greatness, for in a matter of months it has attained a reputation that most inventions take years to win. This switch and electric light controller, it should here be mentioned, is a device whereby electric light is regulated to the same extent as gas. But what is especially remarkable is not so much the number of users at home and abroad as their quality; that is to say, the unusual proportion of experts who have seen fit to adopt it. It is used by many Government departments, including the Office of Works in London, Dublin and Bombay; the National Physical Laboratory; at the Prime Minister's official residence; by the Admiralty; the Governments for India and New Zealand; in asylums at Long Grove, Stone, and Croydon; in the Middlesex, Swansea, and London hospitals; by the Corporations of Leith, Marylebone, Wrexham, Dundee, Ealing, Pontypridd, Leyton, Ilford, West Ham, and Merthyr; and lastly such firms as Edison & Swan, Ltd., Drake & Gorham, Simplex Conduits, Coates & Son, Veritys, Ltd., Witty & Wyatt, Electrical and General Engineering Company, Trollope & Son and Colls & Sons, Ltd., Waring & Gillow, Whiteleys, J. Lyons & Co., and others.

The switch resembles a tumbler type in outward form fitted with a number of frames, each charged with a special composition. The dolly of the switch is connected with the rocking lever, which carries at the inner end spring pistons travelling over contacts connected through a box with the frames. The switch has seven steps enabling the user to obtain a corresponding number of degrees of illumination when the apparatus is connected in series with a lamp, or for producing seven degrees of power in regulating a fan. It will control any number of lamps with a maximum of 600 watts, or about 550 c.p. metallic filament lamps. The light can be reduced to a mere glimmer if necessary, and the cost saved accordingly. It is equally applicable to electric fans, heaters, motors, or any other use of current. The Watkin switch can be used either in series with the ordinary switch or in place of it, and is very neat and compact (being only 4½ inches by 6½ inches), while the internal construction is excellent. It is claimed that when this device is used electric light becomes as cheap and as easily regulated as gas, or the cost of running a fan can be reduced to a minimum. This claim is well substantiated by scientific tests.

At a demonstration given in March last before the Royal Institution the current for a bank of metallic filament lamps was reduced no less than 6 per cent. of the maximum. It is most important to note that this is effected without any alterations of fittings or wiring. The switch connects up with the existing switch or takes its place. The expense is therefore limited to the cost of the switch. The cheapest is 17*s.* 6*d.*; this will control 70 watts, and has three variations of energy. To control from 450 to 600 watts the price is 35*s.*, and this has seven variations.

The Watkin switch succeeds in doing for electric light just the one thing that has been wanting. The consumer will no longer be under necessity to have all the light or none at all from a single lamp or a series. The ability to raise or lower gas exactly to the degree desired, has always been one of its chief advantages, for there are numberless occasions in which it is preferable to have a faint light than to have total darkness. The new invention enables the electric light user, whether on a large or small scale, to do this every bit as satisfactorily to his great personal comfort and financial gain. The patentees and manufacturers are Messrs. Adams & Co., 109 Victoria Street, London, S.W.

THE ASSOCIATION OF WATER ENGINEERS.

THE fourteenth annual general meeting of this association was held in Durham last week. At the opening meeting Mr. Robert Askwith, M.I.C.E., engineer to the Weardale and Consett Water Company, gave his address as the new president. In his opening remarks he stated that in membership steady progress is being made, as is shown by the following figures:—Honorary members 3, members 207, associate members 116, associates 39, total 365. As on former occasions, the increase is chiefly under the heading of associate

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members. The offer made by the retiring president of a 10*l.* premium for a paper entailing research work, and the decision lately come to by the Council to award two premiums of 5*l.* each for papers selected by them, will, it is believed, produce valuable contributions to the "Transactions."

It would prove very useful to members if a table were prepared showing what figure ought to be generally accepted as a reasonable maximum consumption of water per head per day for domestic purposes by communities which are supplied under different circumstances and where constant supply is given. It is difficult to understand why the rate of domestic consumption should vary from ten to forty gallons per head per day or more in different districts. There are, of course, reasons for some differences, as, for example, where the public supply of water is hard it is often supplemented by the use of soft rain water for washing purposes; and the consumption of the public supply is in such cases lower than when this is soft and suitable for all purposes. The number of baths and water-closets relative to the population supplied must also have a great effect on the consumption; but these and other such local differences do not fully account for the great variation that exists. If, however, in the cases where the consumption is relatively high, the difference is caused by waste, the matter is worthy of our most careful consideration. If we assume that 30,000,000 people in these isles take their water supply from public undertakings, and the waste is only a gallon per head per day, the value of the water wasted when worked out at the very low price of 6*d.* per 1,000 gallons amounts to more than a quarter of a million pounds sterling each year. The question of prevention of waste is thus seen to be one of great importance from a monetary point of view; but when we remember that the supply of pure water in this country is limited, and that the various sources are being rapidly appropriated, it becomes a question of vital national importance.

The two most important considerations to be borne in mind in endeavouring to minimise the waste of water are, firstly, to see that only the best quality of water-fittings and the highest class of plumbing work are employed in connection with water undertakings, and secondly, the adoption of an efficient system by which repairs (which in time become necessary, however good the fittings may originally have been) are carried out without loss of time. Mr. Askwith strongly recommended members to take full advantage of the work of the incorporated committee, and to submit all new fittings to a careful examination in regard to the nature of the metal used, the design and the workmanship of the various parts. It is hoped, said the President, that the time is not far distant when incompetent plumbers will not be allowed to carry out any work in connexion with water distribution, and that by the elimination of incompetency in the plumbing trade much preventable waste of water may thereby be checked. As regards the second point, namely, the prompt repair of fittings found to be defective, much remains to be done. The system adopted by the Weardale and Consett Water Company of insurance of fittings has been very effective in securing the prompt repair of defects. The company contract to repair and renew, as necessity arises, all pipes and taps for a payment of 1*s.* per year for each draw-off tap. This system was established more than thirty years ago, and has steadily grown in favour until the company has now upwards of 44,000 taps under their care. Any reports of waste received either direct from the consumers or through the company's inspectors are promptly attended to. By this system the waste of water has been reduced to a minimum; and the consumption last year averaged only nine and a half gallons per head per day for the domestic supply of a population of 360,000. This includes all water consumed by builders and for gardens, cattle, small trades, and washing out service tanks and flushing pipes—meter supplies alone being excluded from the figure quoted.

Before leaving this subject it may be interesting to show the monetary importance of preventing waste by quoting some figures in connection with the Newcastle and Gateshead Water Company. Owing to the increase of population in this company's district during the nine years from 1900 to 1908 inclusive, more than 22,000 extra houses, containing a population of about 110,000 people, and having nearly 17,000 water closets and 9,000 baths, were connected to the company's mains; the additional income from this source amounting to upwards of 20,000*l.* per annum. In spite of this extension of the supply, the total consumption of water for domestic purposes was less in 1908 than in 1900.

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THE INSTITUTION OF GAS ENGINEERS.

THE annual meeting of the above Institution was held in London from June 15 to June 17. At the opening meeting Mr. Thomas Glover, of Norwich, delivered his presidential address. After dealing with topics of special interest to the members, Mr. Glover spoke in the following manner upon the provision of smokeless fuel:—

In the past, as in the present, the chief service of the Institution has been to provide light, and we hope that this may be so for many years to come. The importance of that part of our business and work must not be underestimated; but is it not apparent that in the future we shall be called upon to take no mean part in providing smokeless fuel both gaseous and solid?

The movement for the abolition of the smoke nuisance, as it is called, is gathering strength; and the part the domestic chimney plays in creating the nuisance has now begun to be recognised. It is unbelievable that the inhabitants of our large towns and cities will go on for ever using rich bituminous coal in such a way as to heavily charge the atmosphere they have to breathe with the products of distillation. I do not hesitate to say that it would be a blessing to our people from a sanitary point of view, which might come to be appreciated, if a courageous Chancellor of the Exchequer, casting round for a new basis of taxation, were to seize upon bituminous coal, and so tax all consumers of it (except gas undertakings) as to compel a preference for smokeless fuel. A too plentiful supply of the mineral has resulted in its use by methods truly described as "barbaric," both for manufacturing and domestic purposes. Manufacturers are rapidly reforming and finding that complete combustion pays. The domestic fireplace is a more difficult question.

Taking London as the greatest city and the one most plagued with smoke fogs, we find that it is estimated that there are nearly half a million gas cooking-stoves in use; but the relief to the smoke-charged atmosphere by their use on a late autumn or winter morning is unappreciable because of the millions of apartments which must be warmed by having fires lighted by unscientific hands, in cold grates, and by the use of bituminous coal. Look from a hotel window, or from an elevated railway over London, and gauge the extent of the problem. It will be obvious that, when public opinion has become educated sufficiently and the remedy is at hand, the demand for a smokeless fuel must be enormous. What is true of London is true also of the provincial cities and towns.

The city of Norwich is fondly called by its inhabitants the "City of Gardens." It is provided with numerous open-air spaces and has an abundance of trees and gardens. The factories obtain their power, for the most part, from gas engines and electric motors. In the 25,000 inhabited houses are fixed close on 20,000 cooking-stoves. Gas fires and other heating appliances are being fixed at about the rate of 800 to 1,000 per year. In the summer the city is comparatively free from smoke; but on an autumn or a winter morning the smoke may be met at a distance of three miles from the city boundary, and in the lower parts of the city the atmosphere would be so charged with the products of distillation as to be almost unbreathable.

The loss of sunlight, the ill-effects on health, the damage to buildings, both ancient and modern, the dirt and squalor of our towns, constitute part only of the price the public have to pay for using fuel the wrong way. If a remedy is to be found, it will be through our gas undertakings, which already, by their enterprise, have done much more than has been given credit for by those who are taking a prominent part in the smoke abolition movement. Taking the estimated quantity of gas used for fuel purposes, together with the quantity of coke produced for sale, the gas undertakings of the United Kingdom are providing the public with smokeless fuel equal to about $7\frac{3}{4}$ million tons of coal per annum. By the help of an educated public opinion, the quantity of both kinds of fuel to be supplied from gasworks will be greatly increased.

From some interesting tables recently published by Mr. W. J. Carpenter, of Great Yarmouth, I find that the ratio of day consumption in that town to the total annual consumption in the year 1887 was 27.85 per cent., against 45.01 per cent. in 1907. For the summer months the increased ratio is still more striking:—

In June 1887 the ratio was 20.54 per cent., against 50.42 per cent. in 1907.

In July 1887 the ratio was 19.98 per cent., against 50.96 per cent. in 1907.

... THE ...

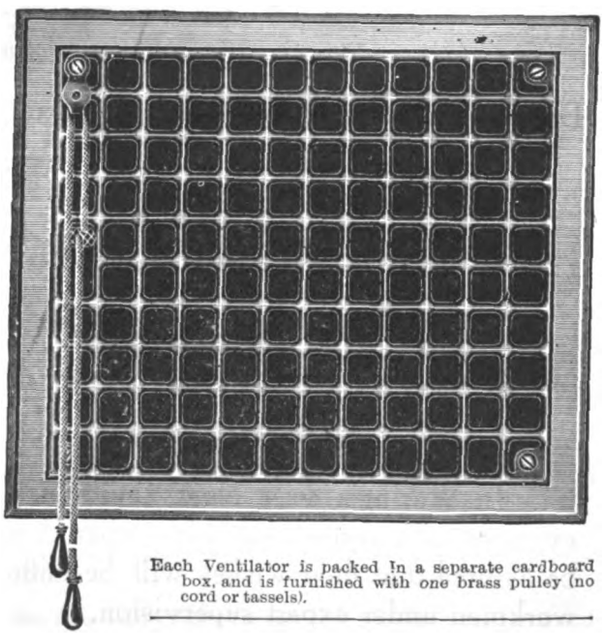
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These Ventilators being made entirely of **Wrought Steel,** breakage either in transportation, in stock or in use, is practically impossible.

They are light in weight, with a consequent **Saving in Carriage.**

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In August 1887 the ratio was 16.07 per cent., against 47.53 per cent. in 1907.

In September 1887 the ratio was 14.78 per cent., against 41.94 per cent. in 1907.

This is interesting evidence, from a seaside resort, of the growing use of gas for fuel purposes. As it may have been observed that an unusually high proportion of the gas consumers of Norwich are provided with cooking-stoves, and as everything is done to popularise the use of gas for lighting purposes, the ratios of day consumption to the total are of interest.

Monthly and Yearly Ratios of Day Consumption to Total Consumption.

—	1905	1906	1907	1908
Total gas sold and	473,204	499,846	528,490	542,866
Day ratios to same	49·9	49·5	49·9	50·8
January	50·2	51·4	52·4	53·2
February	47·6	47·8	48·1	48·4
March	42·3	43·7	41·9	45·5
April	45·1	44·6	45·36	46·5
May	50·4	51·7	50·82	52·7
June	55·1	54·6	55·4	54·9
July	55·7	55·3	55·3	55·2
August	52·1	50·3	51·1	51·9
September	45·8	46·4	47·1	46·9
October	45·5	43·4	46·9	47·5
November	51·1	50·4	51·2	51·8
December	52·7	52·5	53·5	54·6

We may safely assume from the above figures that, so far as Norwich is representative, only about 50 per cent. of the gas is used for producing light; and of this 50 per cent. only about 10 per cent. is now used in luminous flames. Hence the declining importance of the photometer for ascertaining the value of a gas to the average consumer.

The disparity in the illuminating power and calorific tests made on gas produced in vertical retorts also points to the necessity for a change in the authorised standards. The freedom from photometrical testing enjoyed by German gas undertakings has favoured the adoption of the vertical retort and chamber systems of carbonisation. The retention in this country of tests, the value of which is now rapidly becoming nil, will hinder developments in carbonising. We may therefore regard with satisfaction the acceptance by the Gaslight and Coke Company of a clause in their new Bill imposing a calorific test, and look forward with hope to the time when tests for illuminating power will be entirely superseded.

As to the limits imposed and accepted by the calorific test, it has since been stated that 125 calories per foot of gas would constitute a standard higher than can be maintained where the illuminating power is fourteen candles tested with a No. 2 "Metropolitan" burner, and where a mixture of coal gas and carburetted water gas is supplied. In most works, however, there will be no difficulty in complying with such a standard; and the freedom allowed by such a test would be welcomed by many gas engineers who are now obliged to comply with stringent illuminating power regulations.

Household Heating.—Although we may legitimately claim that the gas industry is adapting itself to the new service required of it, and is showing its faith in the future use of gas as a fuel by spending capital freely on appliances which consumers can either hire or acquire on easy terms, and although we believe that in so doing a substantial advance has been made in the solution of the smoke nuisance problem, few gas men are so sanguine as Sir Oliver Lodge, who, from a recent address delivered at Sheffield, appears to anticipate that the whole of the fuel requirements of a model town can be supplied through gas-mains.

For many purposes coke will remain the cheaper and the better fuel; but with coke the conditions have to be fitted to the fuel, and something more can be done in this direction than has been done in this country in the past. The Coalite Company's scheme, however, recognises that the suppression of the open fire-grate will be a slow process; and they therefore propose to fit the fuel to existing conditions retained with such tenacity by the British householder. Along these lines lies abundance of scope for the gas engineer of the present and the future.

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The Coalite Process.—It is claimed by the promoters of "Coalite" that it is a free-burning, smokeless fuel which will compete in the market, not with gas coke, but with high-class coal for use in open fire-grates. The coal for its manufacture is distilled in groups of iron tubes, tapering from 5¼ inches to 4½ inches, set vertically, at a temperature of 800° F. During distillation about 5,000 cubic feet of gas, 20 gallons of tar, and liquor equivalent to 15 lb. of sulphate are produced. The plant, erected on land adjoining the Plymouth Gas Company's works, appears to be a marvel of completeness for carrying on the process economically. The distilling vessels being so small and the temperature required for the process being so low, compared with our practice, the fuel used is said to be only about 6 per cent. of the weight of the "Coalite" produced, and the wear and tear on the settings is reduced to a minimum.

By distilling the coal at the temperature used, the gases evolved are not subject to secondary reactions, the sulphur contents in the purified gas is favourably affected, the thin tars, when distilled, give an unusually large proportion of light spirit (said to be valuable for internal combustion engines), heavy oils free from naphthalene, and pitch innocent of free carbon. In a comparison of manufacturing costs published in the *Times* the gas into the holder from the process is figured out at 4.66*d.* per 1,000 cubic feet. The gas is said to have a heating value of 750 B.Th.U., and to have an illuminating power of twenty candles.

The departure from our ordinary retorting practice is so revolutionary, and the methods of exploiting have been so bold, it is not to be wondered at if the claims have been received with a certain amount of scepticism. The working of the plant at Plymouth, however, puts the proposition on to a different footing; and it is evident that, as gasmakers no less than as smokeless fuel providers, we cannot afford to neglect an examination of its claims. It may be that the Coalite process will become an auxiliary to the older system, and that it is destined to extend the sphere of public usefulness rendered by gas undertakings.

The Competition of Electricity.—Before bringing this address to a conclusion, I should like to revert to the diagrams of hourly gas consumption. If they reveal an important demand for other purposes than that of producing light, they also show how much we run the risk of losing if every care is not taken to satisfy the requirements of consumers as to their lighting arrangements. Hitherto convenience and cleanliness have favoured electricity, while relative cheapness has weighed with the prudent in favour of gas. The metallic filament lamp has done something to reduce the costliness of electricity; but corresponding improvements have enabled us to supply a greatly improved light with better facilities for turning on and off, and at the same time stained ceilings and over-heated rooms are practically things of the past where well-made and properly adjusted inverted burners are used.

With a duty of 20 to 30 candles per foot of gas for ordinary pressure, and 60 candles upwards per foot for high pressure supply, the days of gas lighting are not yet over. But our competitors are vigorous and active, and their artistic fittings place our unattractive brackets and chandeliers, the heritage of a hundred years of gas lighting, at a great disadvantage. To satisfy the educated taste of consumers, is it not important that artistic fittings should be supplied on easy terms, and so give our new forms of gas lighting a real chance? In the same way I believe that all better-class slot installations should be made models and examples to be copied by others. In such an installation the supply will be governed at the meter; the piping of the house will be sound and good; and the fittings will be light and artistic in design. Inverted burners will be used in the best rooms; and, if possible, maintenance of the mantles and burners, under certain conditions, will be undertaken.

Our electrical competitors have led the way in devising new and ingenious methods of charging for the energy they supply, and have frequently the advantage where rigid methods of charging for gas are adhered to. To compete for outside shop lighting it has been found necessary to quote an inclusive annual charge for a given candle-power over a number of lighting hours. The annual charge includes the hire of lamps, maintenance, cleaning, lighting and extinguishing. The cost of the latter may be obviated by the use of an hourly meter to register the number of hours the lamps are in use. This class of lighting business is well worth cultivating, as it keeps the capabilities of gas lighting before the public.

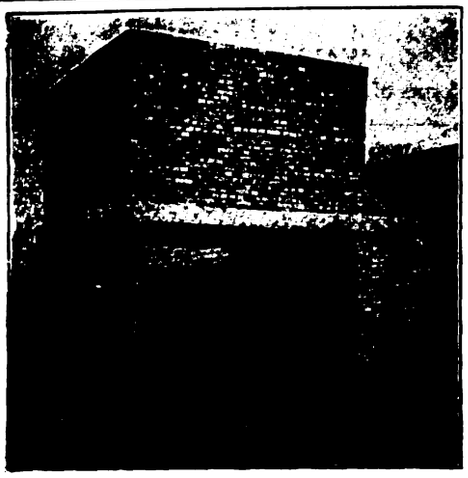
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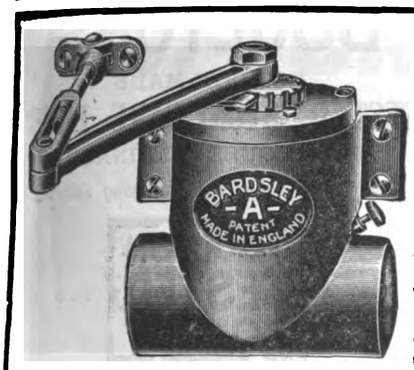
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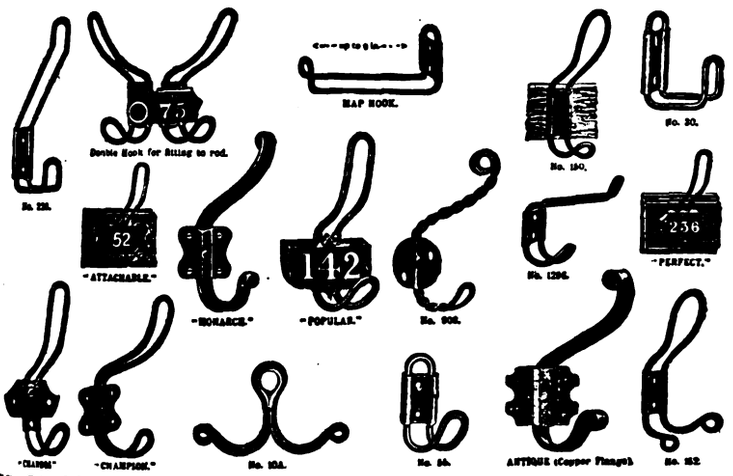
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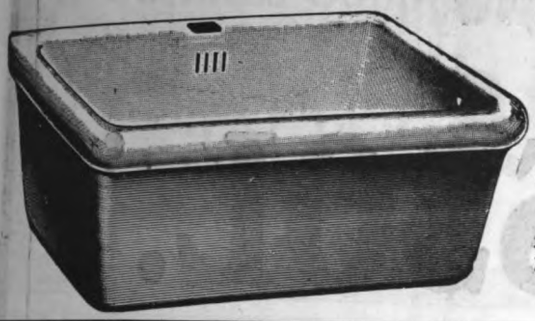
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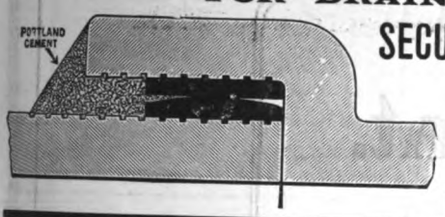
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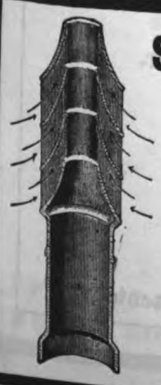
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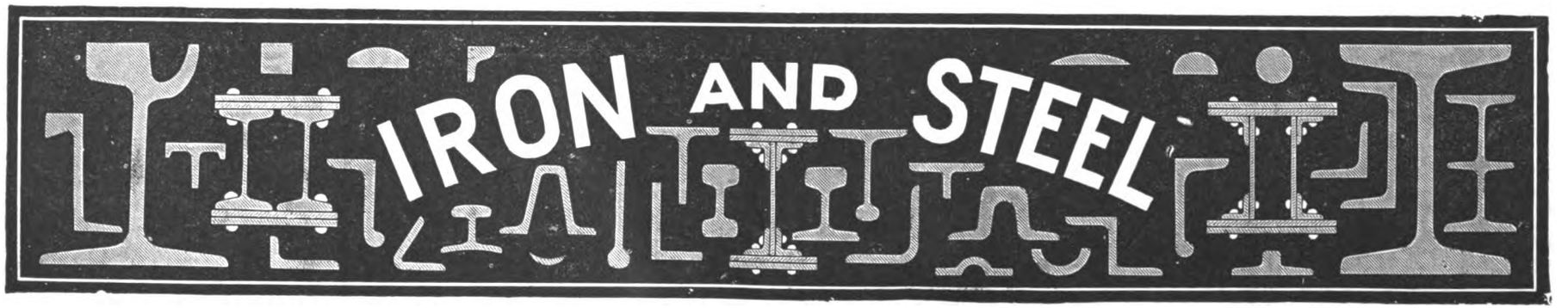
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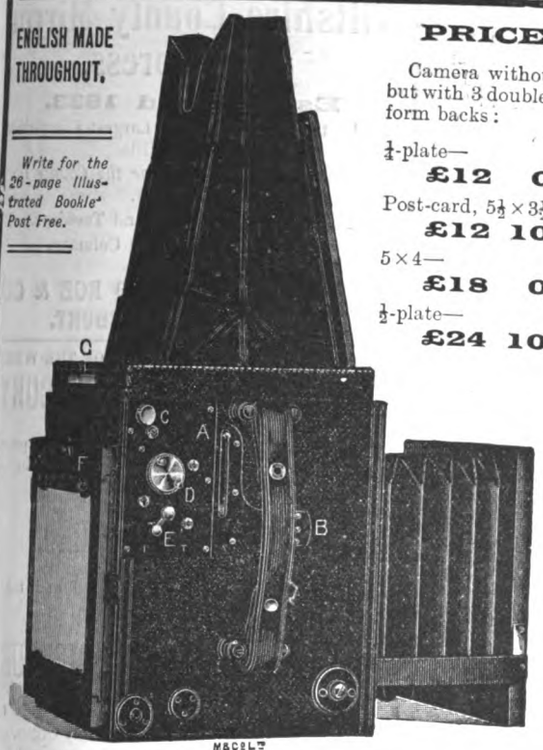


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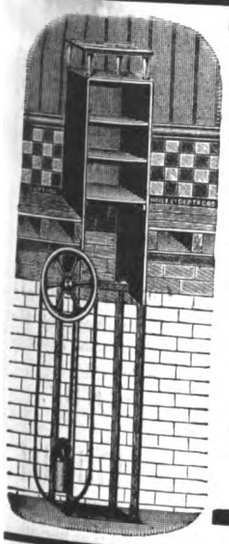
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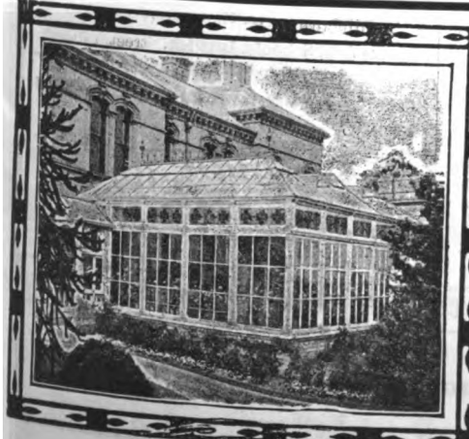
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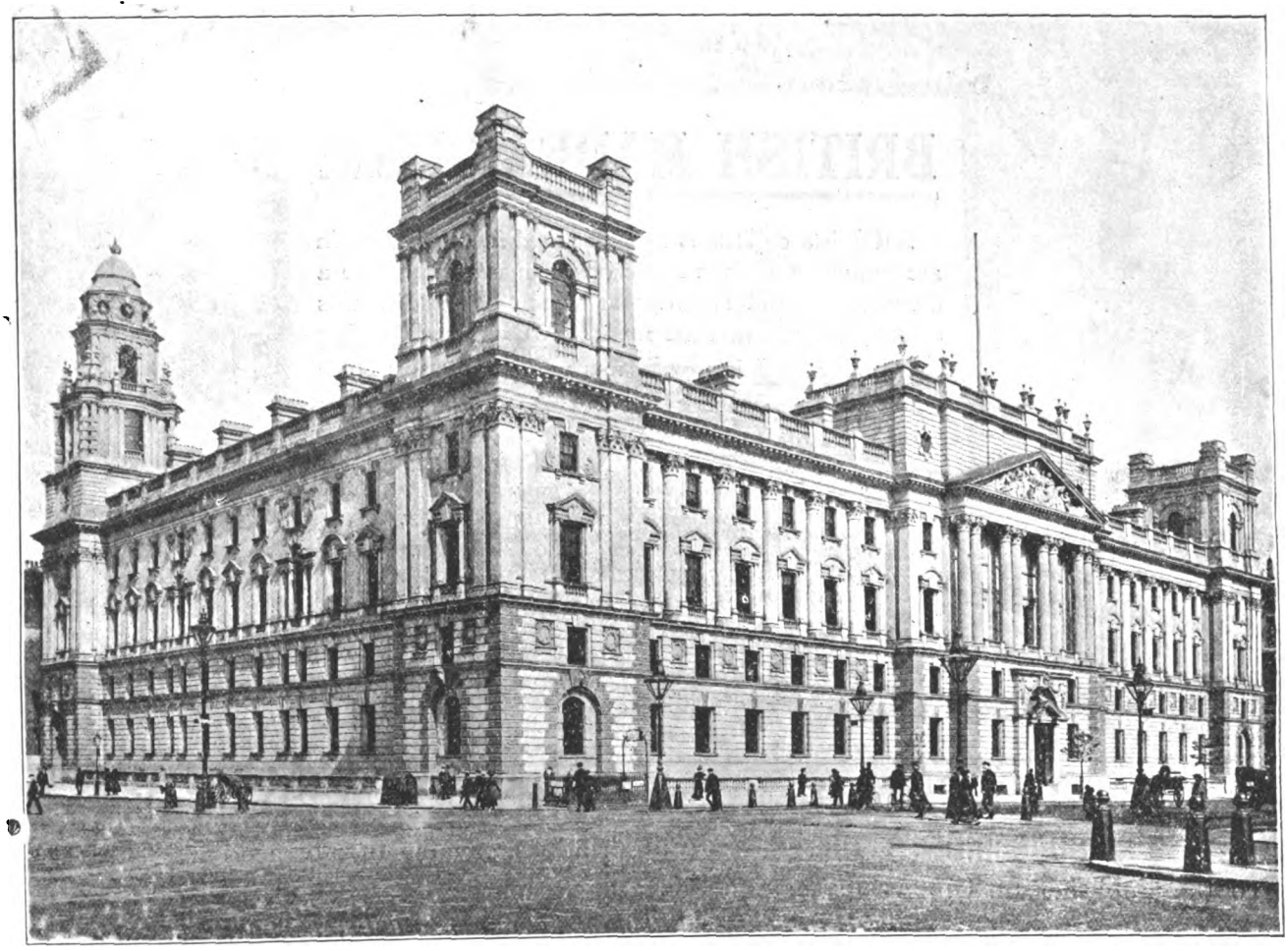
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Architect and Contract Reporter.

FRIDAY, JULY 9, 1909.

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EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

BURSLEM.—July 17.—For new public buildings. The author of the design placed first by the assessor will carry out the work. The architects placed second and third will receive premiums of 100*l.* and 50*l.* respectively. Deposit 2*l.* 2*s.* Mr. F. Bettany, borough surveyor, Burslem.

DEPTFORD.—Sept. 1.—The Metropolitan Borough Council of Deptford invite designs for a branch library at New Cross, S.E. Premiums of 50 guineas, 25 guineas and 10 guineas will be awarded. Assessor, Mr. J. S. Gibson, V.P.R.I.B.A. Deposit 1*l.* 1*s.* Competition is limited to architects practising in the city or county of London. Mr. Vivian Orchard, Town Clerk, Town Hall, New Cross Road, S.E.

GLASGOW.—July 31.—The patrons of the Royal Incorporation of Hutchesons' Hospital invite designs for laying out for feuing and building about 195 acres of their lands of Thornliebank, Eastwood. Premiums of 100*l.*, 75*l.*, 50*l.* and 25*l.* will be awarded. Deposit 3*l.* 3*s.* Messrs. Hill & Hoggan, 194 Ingram Street, Glasgow.

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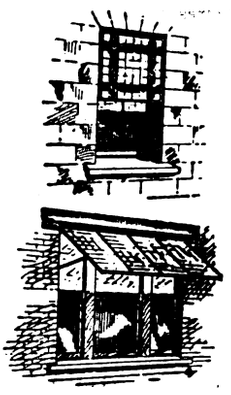
READING.—July 31.—The Berkshire County Council invite designs for offices, committee rooms, &c., on the Forbury, Reading. Mr. Mervyn Macartney, F.R.I.B.A., assessor. Premiums of 100*l.*, 75*l.*, and 50*l.* Deposit 1*l.* 1*s.* Apply to Mr. J. Fred Hawkins, county surveyor, Bank Chambers, Cross Street, Reading.

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WHITBY.—July 30.—The North Riding of Yorkshire County Council education committee invite designs for a secondary school. Mr. Paul Waterhouse, assessor. Apply to the Secretary, Education Offices, County Hall, Northallerton.

CONTRACTS OPEN.

ARDSLEY (BARNSLEY).—July 17.—For the following works, to be carried out during the Midsummer holidays, which extend from July 30 to August 30, 1909, for the West Riding County Council Education Department:—(1) Ardsley (Barnsley) C., junior mixed and infants' departments: painting inside and outside; (2) Ardsley (Barnsley) C., junior mixed department: ventilation—trade, joiner. Mr. T. Graham, the West Riding Education Offices, Obelisk Chambers, Barnsley.

ASHFORD.—July 14.—For alterations to the single constables' quarters at the Ashford police-station, Kent. The County Architect, 86 Week Street, Maidstone.

ASHLEY.—July 12. For erection of an additional classroom for fifty children and a cloakroom at Ashley Council school, Wants. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

ASPULL.—July 27.—For erection of an elementary school for infants at Aspull, near Wigan, for 300 scholars. Deposit 2*l*. Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

BAKEWELL.—For erection and completion of public baths in the Bath Gardens. Deposit 10*s*. Messrs. Bryden & Walton, architects and surveyors, Buxton.

BARNSTAPLE.—For erection of a detached residence on a site adjoining Rumsam Road, Newport, Barnstaple. Messrs. W. C. Oliver & Son, A.R.I.B.A., M.S.A., Bridge End, Barnstaple.

BERKELEY.—July 30.—For erection of an elementary school at Berkeley, Gloucestershire. Deposit 2*l*. 2*s*. Send names by July 10 to Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

BICESTER.—July 12.—For the construction of the new cattle market as follows:—Contract No. 1—Buildings, roads, drainage and concreting. Contract No. 2—Constructional ironwork for cattle, sheep and pig pens. Deposit 3*l*. 3*s*. each. Mr. Richard Parker, surveyor, Market Hill, Bicester, Oxon.

BOLTON.—July 28.—For erection of (*a*) the Astley Bridge and Great Lever branch libraries. Messrs Bradshaw & Gass, F.R.I.B.A., architects, 19 Silverwell Street, Bolton. (*b*) The Halliwell branch library. Messrs. Henderson & Brown, architects, Fold Street, Bolton.

BRADFORD.—For erection of a skating-rink at Toller Lane. Send names to Mr. W. E. Thresh, architect, Thorpe Chambers, Bradford.

BRADFORD.—July 12.—For the various works (painter's excepted) required in erection of a dairy in Usher Street, Wakefield Road. Mr. William Rycroft, architect, Bank Buildings, Manchester Road, Bradford.

BRIGHTON.—For the conversion of Silwood Lodge (top of), Oriental Place, Brighton, into eight self-contained flats and caretakers' quarters. Deposit 1*l*. 1*s*. Mr. Howard Parsons, 16 Palmeira Avenue, Hove, Sussex.

BUBWITH.—July 12.—For repairs to the tower of the parish church of Bubwith, Yorks. Mr. C. Hodgson Fowler, F.S.A., architect, The College, Durham.

BURY.—July 10.—For the erection of a secondary school in Westminster Street. Deposit 2*l*. Mr. J. T. Halliday, A.R.I.B.A., 14 John Dalton Street, Manchester.

CHOPWELL.—July 16.—For erection of a lock-up at Chopwell, Durham. Mr. William Crozier, A.M.I.C.E., county surveyor, Shire Hall, Durham.

CROYDON.—July 14.—For the builder's work necessary in erection of a temporary floor at the Central Swimming Hall, Scarbrook Road. Deposit 1*l*. 1*s*. The Borough Engineer, Town Hall, Croydon.

CRICKLADE AND SWINDON.—July 12.—For internal and external renovations to Cricklade, Old Swindon and New Swindon police stations, Wilts. Mr. J. George Powell, county architect and surveyor, County Offices, Trowbridge.

DARTON (YORKS).—July 17.—For the following works, to be carried out during the Midsummer vacation, for the West Riding County Council:—(1) Darton: Mapplewell C., girls' department: new lavatory basins—trade, plumber; (2) Darton: Mapplewell C., infants' department: asphalt-

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ing of playshed and portion of yard at present ashed. Mr. T. Graham, West Riding Education Offices, Obelisk Chambers, Barnsley.

DRIGG.—July 10.—For erection and completion of a dwelling-house at Drigg, Cumberland. Send names to Mr. J. S. Stout, architect, 36 Lowther Street, Whitehaven.

DRIGHLINGTON.—For all or separate trades in erection of the Tempest Constitutional Club, Drighlington, Yorks. Send names to Mr. Louis Ambler, architect, Temple Chambers, Temple Avenue, London.

DURHAM.—July 20.—The County Council invite sole tenders (1) for new higher elementary school and pupil teacher centre at Tanfield Lea, new Council school at Bloemfontein, and (2) alterations at Willington and Collierley Council schools. (1) Mr. W. Rushworth, Shire Hall, Durham; (2) Mr. F. E. Coates, Shire Hall, Durham.

ELLAND.—July 12.—For the various works (painting excepted) required in erection of a detached villa at Hullen Edge, Elland, Yorks. Messrs. Richard Horsfall & Son, architects, 22A Commercial Street, Halifax.

GILLINGHAM.—July 10.—For extending Byron Road and Richmond Road Council schools, Gillingham, Kent. Mr. J. L. Redfern, A.R.I.B.A., borough surveyor (surveyor to the education committee), Council Offices, Gardiner Street, Gillingham, Kent. Deposit 10*s.* 6*d.* each contract with Mr. Andrew Johns, education secretary, 4 Gardiner Street, Gillingham.

GRANTHAM.—July 14.—For erection of a girls' secondary school. Deposit 1*l.* 1*s.* Mr. H. H. Dunn, A.R.I.B.A., Silver Street, Lincoln.

GRIMSBY.—July 17.—For shop, warehouse, &c., in Maude Street or Cartergate. Mr. R. A. Robertson, architect and surveyor, 3 Flottergate, Grimsby.

GUILDFORD.—July 12.—For the construction of the superstructural buildings (upon foundations already completed) over the refuse-destructor plant and machinery at Bellfields, Stoke. Deposit 2*l.* 2*s.* Mr. C. G. Mason, A.M.I.C.E., borough engineer and surveyor, Tuns Gate, Guildford.

GUILDFORD.—July 17.—For erection of certain walling and a sanitary outbuilding on the workhouse premises. Mr. Edward L. Lunn, architect, 36 High Street, Guildford.

HAINE.—July 13.—For alterations and additions at the receiving block, Isle of Thanet Joint Hospital, Haine, near Ramsgate. Deposit 3*l.* 3*s.* Mr. H. Bertram Langham, Board's architect, Bank Chambers, Broadstairs.

HANDSWORTH.—July 19.—For erection of a chapel and entrance lodge at the cemetery at the Leveretts, Handsworth, Staffs. Deposit 3*l.* 3*s.* Send names by July 6 to Mr. Ernest Ward, clerk, the Council House, Handsworth.

ILFORD.—July 19.—For erection and completion of brick boundary walling, wrought-iron palisading on granite base, and entrance gates to enclose the boys' and girls' school site at the South Park elementary school, Water Lane. Deposit 5*l.* 5*s.* Mr. C. J. Dawson, F.R.I.B.A., 11 Cranbrook Road, Ilford.

IRELAND.—July 14.—For repairs, &c., to the surgeon's house, Longford Infirmary. Mr. S. Wilson, registrar, Medical Hall, Longford.

IRELAND.—July 14.—For erection of a dispensary and caretaker's residence at Carrickfergus, for the Guardians of Larne Union. Mr. W. D. R. Taggart, architect, 51 and 52 Scottish Provident Buildings, 2 Wellington Place, Belfast.

IRELAND.—July 17.—For providing apartments for the Sisters of Mercy in the Castlerea workhouse, and for certain structural alterations incident thereto. Messrs. W. H. Bryne & Son, architects, 20 Suffolk Street, Dublin.

IRELAND.—July 19.—For improvements to Gortnessy Manse. Messrs. Robinson & Davidson, architects and engineers, Richmond Street, Londonderry.

IRELAND.—July 22.—For erection and completion of Congregational church at Ballynahinch, co. Down. Mr. John Seeds, architect, 7 Donegall Square West, Belfast.

KIRKBY-IN-ASHFIELD (NOTTS).—July 10.—For new Wesleyan chapel and school. Send names to Mr. J. E. Goodacre, architect, Alexandra Avenue, Mansfield.

LEIGH (LANCS).—July 16.—For new vestries at the parish church. Messrs. Austin & Paley, architects, Lancaster.

LEICESTER.—July 12.—For erection of public baths in Knighton Fields Road West. Deposit 1*l.* 1*s.* Mr. Arthur H. Hind, A.R.I.B.A., 3 Grey Friars, Leicester.

LITTLEPORT, &c. (I. OF ELY).—July 12.—For erection of a new class-room with other alterations at the town

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schools, Littleport; also for minor alterations at Stretham, Doddington and Wimblington schools. The County Surveyor's Office, Ely.

LONDON.—July 12.—The Tottenham education committee invite tenders for summer repairs to various schools in their district. Separate tenders are invited for repairs to playgrounds. Deposit 1*l.* 1*s.* Mr. W. H. Prescott, A.M.I.C.A., surveyor to the committee, Council Offices, Tottenham.

LONDON.—July 12.—For erection of a toolhouse and store in West Mall, Notting Hill Gate, for the Kensington Royal Borough Council. The Borough Engineer's Department, Town Hall, Kensington, W.

LONDON.—July 19.—For erection of eight cottages in Mill Road, Merton Abbey Estate, High Street, Merton, S.W. Mr. Henry R. G. S. Smallman, A.R.I.B.A., 8 Queen Street, Cheapside, E.C.

LONDON.—July 19.—For the fireproofing of the National Gallery, East Wing. Deposit 1*l.* 1*s.* Mr. H. N. Hawks, I.S.O., H.M. Office of Works, Storey's Gate, S.W.

LONDON.—July 21.—For additional accommodation for male staff at the Eastern Fever Hospital, Homerton Grove, Homerton, N.E. Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief, Metropolitan Asylums Board.

MANCHESTER.—July 12.—For erection of the Moseley Road Municipal school, Fallowfield. Deposit 2*l.* 2*s.* The Education Offices, Deansgate, Manchester.

MIDDLESBROUGH.—July 15.—For alterations and additions to Cannon Street police-station. Mr. S. E. Burgess, M.I.C.E., borough engineer, Municipal Buildings, Middlesbrough.

NEWBIGGIN-BY-SEA.—July 13.—For extending the Newbiggin-by-the-Sea Council school, Northumberland. Deposit 1*l.* 1*s.* Send names to Mr. C. Williams, secretary to the education committee, the Moot Hall, Newcastle-on-Tyne.

NORTHFLEET.—July 13.—For erection of a small brick-built urinal on the Ebbs Fleet pleasure ground, for the Northfleet Urban District Council. Mr. J. A. Mitchell, district surveyor, Council Offices, The Hill, Northfleet, Kent.

PORTSMOUTH.—July 22.—For constructing and maintaining in thorough repair for six months a ferro-concrete retaining wall at the Fish Market, Portsmouth, together with a wooden bulwark and stairs and other works in connection therewith. The Borough Engineer's Office, Town Hall, Portsmouth.

ROYSTON, NEAR BARNSLEY.—July 17.—For the following works, to be carried out during the summer holidays, which extend from July 30 to August 30, 1909, for the West Riding County Council Education Department:—(1) Royston C. school, girls' department: erection of partition in main room; (2) Royston C. school, boys' department: ventilation; (3) Royston C. school, infants' department: ventilation; (4) Royston C. school (all departments): painting and colourwashing. Specifications on application. Mr. T. Graham, West Riding Education Offices, Obelisk Chambers, Barnsley.

ST. ALBANS.—July 15.—The visiting committee of the Middlesex County Asylum, Napsbury, St. Albans, Herts, invite names of contractors willing to tender for alterations and additions to accommodate 582 additional patients at the asylum. Offers to undertake a portion of the work only will not be entertained. A selection will be made, and the selected firms will then be invited to tender. Mr. Rowland Plumbe, F.R.I.B.A., architect, 13 Fitzroy Square, London, W.

SALISBURY.—July 17.—For erection of a mortuary in Salt Lane. Mr. W. J. Goodwin, A.M.I.C.E., city engineer and surveyor, Municipal Offices, Salisbury.

SANDHURST.—July 16.—The Secretary of State for War invites tenders for the following work:—Erection of superstructure of six cadet blocks and administrative block, also drainage, metalling and grading parades, roads and paths, turfing slopes, &c., at the Royal Military College, Sandhurst, in the Aldershot command. Send names to the Director of Barrack Construction, 80 Pall Mall, London, S.W., or at the Barrack Construction Office, Royal Military College, Sandhurst.

SCOTLAND.—July 10.—For mason, joiner, plumber, plasterer, slater, asphalte work, painter work, heating and electric lighting, &c., of Lauder technical school extension. Mr. D. Gorrie, clerk to the School Board, 104 High Street, Dunfermline.

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SCOTLAND.—July 12.—For excavation of ground, building of foundations and offices, in connection with temporary school building to be erected at Kinlochleven. Deposit 5*s*. Mr. D. Macintyre, clerk, School Board, Port Appin.

SCOTLAND.—July 12.—For the mason, carpenter, slater and plasterer works of reconstruction of dwelling-house at Backhill, Learney, Torphins, Aberdeen. Mr. William Coutts, ground officer, East Learney, Torphins.

SHOOTER'S HILL.—July 16.—For the construction of a water tower and other subservient works. Deposit 10*l*. with the Accountant, Metropolitan Water Board Offices, Savoy Court, Strand, W.C.

SMARDEN.—July 14.—For general repairs at the Smarden Council schools, Kent. Mr. E. W. Buss, West End, Smarden, S.O.

TOWCESTER (NORTHANTS).—July 12.—For alterations and additions at the Towcester infants' school. Send names to Mr. J. T. Blackwell, architect, 53 High Street, Kettering.

TREVERBYN MOOR.—July 10.—For erection of two houses at Treverbyn Moor, Cornwall. Mr. Thos. Hore, Moor View, near Trethurgy, St. Austell.

TWICKENHAM.—July 14.—For the provision of conveniences and dressing accommodation in the mansion at Marble Hill, Twickenham, for the London County Council. The Architect's Department, 19 Charing Cross Road, W.C.

WAKEFIELD.—July 12.—For the whole or any portion of the work required in building a junior boys' department and manual workshop, physical laboratory and art room in connection with the science block at the Grammar School. Send names to Messrs. Simpson & Firth, architects, Southgate Chambers, Wakefield.

WALES.—For erection of workmen's cottages on Mynyddygarreg. Apply to Mr. A. Y. Dinas, Silica Brick and Lime Company, Ltd., Kidwelly.

WALES.—July 10.—For erection of two pairs of semi-detached villas at The Walk, Merthyr Tydfil. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

WALES.—July 12.—For erection of boundary walls to the County school, Merthyr Tydfil. The Deputy Surveyor, Town Hall, Merthyr Tydfil.

WALES.—July 12.—The Ebbw Vale education committee invite tenders (by schedule of prices) for jobbing works to the schools for twelve months. Deposit 10*s*. 6*d*. Mr. Henry Waters, architect, Market Chambers, Ebbw Vale.

WALES.—July 12.—For erecting 100 houses at Mardy, Glam. Mr. Gomer Evans, Mardy, Glam.

WALES.—July 14.—For alterations at the Ship Inn, Dowlais. Mr. C. M. Davies, architect, Merthyr.

WALES.—July 16.—For carrying out improvements at Graigddu school, Pentre, for the Rhondda Urban District Council. Deposit 1*l*. 1*s*. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

WALES.—July 17.—For proposed new vestry, &c., in Field Street, Penygraig. Mr. R. S. Griffiths, M.S.A., architect and surveyor, Tonypandy.

WALES.—July 17.—For erection of a building and the construction of a swimming-bath for the Y.M.C.A. at Ammanford. Deposit 2*l*. 2*s*. Send names to Mr. David Thomas, M.I.Mun.E., architect and surveyor, Quay Street, Ammanford.

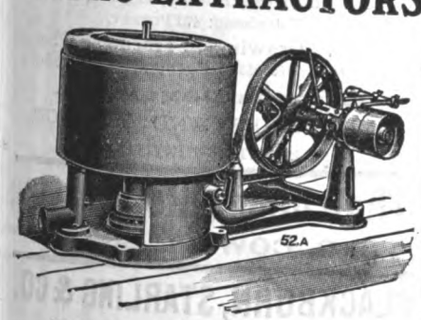
WALES.—July 17.—For renovating Penuel Baptist Chapel, Priory Street, Carmarthen. Messrs. George Morgan & Son, F.R.I.B.A., architects, Carmarthen.

WALES.—July 19.—For carrying out the following works for the Mountain Ash education committee:—(1) Building retaining walls, &c., re-forming, ballasting and gravelling Caegarw girls' and infants' schools' playgrounds; (2) building chimney breast, stack, &c., providing and fixing glazed partition and other minor alterations at Ynysboeth mixed school. External painting of (3) Trerobart boys' school; (4) Navigation boys', girls', relief and infants' schools; (5) Penrhiwceiber boys', girls' and infants' schools; (6) Caegarw boys' school; (7) Miskin mixed and infants' schools; (8) Cefnpennar infants' school. The Architect's Office, Town Hall, Mountain Ash.

WALES.—July 20.—For making alterations and additions to vestry, Bethel Welsh Calvinistic Methodist chapel, Ystrad Rhondda. Deposit 2*l*. 2*s*. Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre.

WALES.—July 22.—For rebuilding Moriah Calvinistic Methodist chapel, Llanstephan. The Chapel House, Llanstephan.

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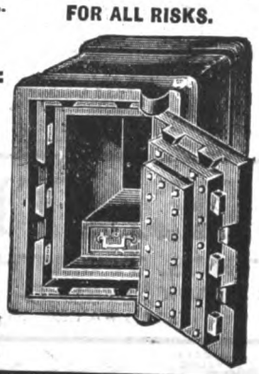


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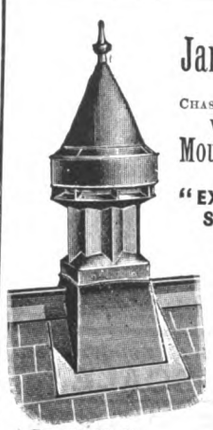
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WALES.—July 27.—For erection of six houses at Trehafod. Mr. Edward Rees, architect and surveyor, Alexandra Chambers, Pontypridd.

WALSALL.—July 23.—For executing various alterations, additions and renovations to the music-hall, Bloxwich, for the Corporation. The Borough Surveyor, Council House, Walsall.

WHALEY BRIDGE.—July 10.—For erection of joint Council schools at Whaley Bridge, Derbyshire, to accommodate 336 children (mixed and infants), with cookery and manual instruction rooms. Deposit 1*l.* 1*s.* Mr. George H. Widdows, A.R.I.B.A., architect to the committee, County Education Office, St. Mary's Gate, Derby.

WHITEHAVEN.—July 17.—For alterations and additions to No. 1A Victoria Road. Messrs. J. S. Moffat & Bentley, architects, 53 Church Street, Whitehaven.

WIGTON.—July 14.—For the joiner's work required in the Court House fittings at the Wigton police-station. Send names to Mr. Geo. Dale Oliver, F.R.I.B.A., county architect, Carlisle.

WINCHESTER.—July 19.—For the extension of Post Office. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

WINDSOR.—July 15.—For erection of new houses in Park Street, for the Commissioners of H.M. Works and Public Buildings. Mr. A. Y. Nutt, M.V.O., assistant architect, Windsor Castle.

WOOLER.—July 10.—For alterations and additions to Wooler C.E. school premises, Northumberland. Mr. M. Temple Wilson, M.R.S.I., architect and surveyor, Alnwick.

WROUGHTON.—July 12.—For works at the two Council schools. Mr. H. Copleston, Swindon Road, Wroughton, Wilts.

THE Kent education committee have decided that a school is to be erected at Cliffe for about 100 infants, the plans, however, to allow of a subsequent extension of the buildings if necessary. The committee have also resolved that in all cases of contracts exceeding 500*l.*, the contractors are to be required to provide two sureties for the satisfactory performance of the contract.

TENDERS.

APPLEBY.

For erecting an elementary school, for Westmorland County education committee. Mr. J. HARTLEY, architect, Skipton.

Accepted tenders.

Brassington Bros., Settle, mason and joiner	£3,807	0	0
J. & W. Scott, Penrith, plumber	474	0	0
Dodgson, Appleby, slating	306	0	0
Dodgson, Appleby, plastering	204	0	0
Chatterley, Appleby, ironwork	147	0	0
J. & W. Scott, Penrith, painting	95	0	0

BARBY.

For alterations and additions at the Barby school, Northants. Mr. J. T. BLACKWELL, architect, Kettering.

Heath	£630	0	0
Winn & Son	626	2	5
Hollowell	549	0	0
Cleaver	530	0	0
Bosworth & Wakeford	520	0	0
Webster	518	0	0
Drever	517	0	0
Holland & Marks	498	5	3
Green	498	0	0
Harris	490	0	0
Beardsmore & West	484	0	0
Chown	470	0	0
Perkins	469	0	0
Adams & Son	463	10	0
Hickman	449	15	0
Higgs	429	0	0
Sargent	415	0	0

BASONBRIDGE.

For erection of a new milk factory at Basonbridge, for the Wilts United Dairies, Ltd., Devizes.

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Trask & Son	6,996	0	0
Hayward & Wooster	6,888	0	0
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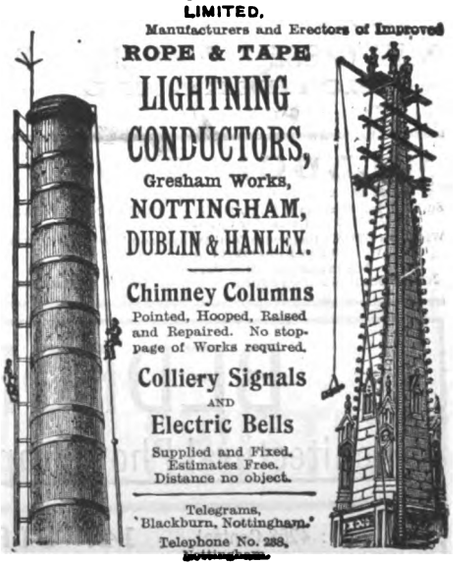


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BASONBRIDGE—*continued.*

Gleed Bros.	6,399	0	0
Stephens, Bastow & Co.	6,395	0	0
Mussellwhite & Sapp	6,296	0	0
Long & Sons	6,291	0	0
Downing & Rudman	6,277	0	0
Pollard & Son	5,887	0	0
DOVE BROS., London (*accepted*)	5,875	0	0

BROWN LEES (STAFFS.).

For erecting a Primitive Methodist church. Messrs. ELIJAH JONES & JACKSON, architects, Hanley.

Heath	£1,854	0	0
Moss	1,700	0	0
Sambrook	1,700	0	0
Young & Son	1.649	0	0
Yorke & Goodwin	1,630	0	0
Colley & Lindop	1,626	0	0
Tompkinson & Betteley	1,626	0	0
Gallimore	1,625	0	0
Comes & Sons	1,620	0	0
Colclough & Breeze	1,620	0	0
Bennett Bros.	1,590	0	0
Smith	1,575	0	0
Poole	1,560	0	0
SHERRATT, Stoke (*accepted*)	1,554	0	0
Machin	1,455	0	0

EDMONTON.

For erection of secondary school for boys. Mr. H. G. CROTHALL, architect to the Middlesex education committee.

Johnson & Co.	£8,033	0	0
Brand, Pettitt & Co.	7,700	0	0
L. & W. H. Patman	7,690	0	0
Rowley Bros.	7,571	0	0
Mattock Bros.	7,490	0	0
Fairhead & Son	7,344	0	0
Renshaw	7,333	0	0
Porter	7,275	0	0
Stewart	7,232	0	0
Treasure & Son	7,079	0	0
Knight & Son	6,945	0	0
Lawrence & Son (*recommended*)	6,782	0	0

HEMSWORTH.

For the erection of athletic club buildings at Hemsworth Collieries, near Wakefield. Messrs. GARSIDE & PENNINGTON, architects, Pontefract and Castleford.

F. H. & J. W. Moore	£4,348	3	0
Simpson & Watson	4,143	15	11
Hanley	3,873	16	9
Dews & Co.	3,768	0	0
JOHNSON & SON, Mirfield (*accepted*)	3,678	14	7

HOLNE.

For erection of a farm-house at Middle Stoke Farm, near Holne Village, Devon. Mr. W. F. TOLLIT, architect, Totnes.

Churchward	£680	0	0
Horsman	650	0	0
Badcock	507	0	0
Pomroy	490	3	0
WINSOR, Ashburton (*accepted*)	477	10	0

LITTLEHAMPTON.

For building and completing a shelter on the Green. Mr. H. HOWARD, surveyor, Littlehampton.

Hill	£1,576	17	0
Smith	1,490	0	0
Hockley & Co.	1,476	0	0
Linfield & Son	1,448	0	0
Wallis	1,197	0	0

LONDON.

For the supply and erection of the condenser water piping, valves, &c., required for the final portion of the Greenwich generating station.

Russell & Sons	£3,236	18	0
Wilson & Co.	3,183	18	2
Oakes & Co.	3,092	18	0
John Spencer, Ltd.	3,064	5	8
Staveley Coal and Iron Co.	3,024	15	4
Railway and General Engineering Co., Ltd., Nottingham (*recommended*)	2,986	14	6
Foster Bros.	2,617	0	0
Chief Officer of Tramways estimate	3,500	0	0



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LONDON—*continued.*

For the supply and erection at the Greenwich generating station of steam, exhaust, feed and drain piping, valves, water tanks, &c., required for the final portion of the station.

Edward le Bas & Co.	£8,495	2	5
Babcock & Wilcox	8,400	0	0
Spencer	8,291	7	11
Stewarts & Lloyds	8,232	9	8
Foster Bros.	8,168	12	0
Oakes & Co.	8,002	19	0
Russell & Sons	7,954	9	6
Shelby Manufacturing Co.	7,733	13	3
Staveley Coal and Iron Co. (ii)	7,566	7	2
Railway and General Engineering Co.	7,342	13	1
Staveley Coal and Iron Co., Ltd., Chesterfield (i) (*recommended*)	7,066	7	2
Chief Officer of Tramways estimate	9,000	0	0

For the structural improvement of the Atley Road school, Bow and Bromley, for the L.C.C.

Parker & Sons	£13,388	0	0
Thomas & Edge	12,896	0	0
Spencer, Santo & Co.	12,746	0	0
Perry & Co. (Bow)	12,570	0	0
F. & E. Davey	12,155	0	0
Harris	12,137	0	0
Patman & Fotheringham	11,921	0	0
Symes	11,906	0	0
J. & C. Bowyer	11,728	0	0
F. & T. Thorne	11,627	0	0
Lawrance & Sons	11,332	0	0
Chessum & Sons 7A South Place (*recommended*)	10,981	19	2
Architect's (Education) estimate	11,500	0	0

For the supply of the fittings and the execution of the wiring at the Great Marlborough Street fire station, for the L.C.C.

Hawkins & Sons	£210	0	0
Fryer & Co.	194	0	0
Tredegar & Co.	182	0	9
Pinching & Walton	169	7	6
Taylor & Co., 8 Bush Lane (*recommended*)	169	0	0

LONDON—*continued.*

For the erection of a further instalment of 105 cottages, comprising fifty-three of three rooms and scullery and fifty-two of four rooms and scullery.

Wall	£26,550	0	0
F. & T. Thorne	25,589	0	0
Roberts & Co.	24,899	0	0
Wallis & Sons	24,240	0	0
Carter	22,247	0	0
Coxhead	20,692	0	0
Rowley Bros., Tottenham (*recommended*).	19,343	0	0
Architect's estimate	20,321	0	0

For engine-house, foundations, &c., at Hadley Road Well, for the Metropolitan Water Board.

Coles	£4,765	0	0
Mattock & Parsons	3,873	0	0
Pedrette	3,861	0	0
Byrom	3,710	0	0
McAlpine & Sons	3,608	0	0
Shellabear & Son	3,530	0	0
Muirhead & Co.	3,461	0	0
Mowlem & Co.	3,435	0	0
Kavanagh & Co.	3,221	0	0
Lawrence & Son	3,032	0	0
Bentley & Sons	3,015	0	0
Dick, Kerr & Co.	3,002	0	0
Pattinson & Sons	2,851	0	0
Kirk & Randall	2,841	0	0
Brebner & Co.	2,816	0	0
Wall	2,802	0	0
Newby & Bros.	2,800	0	0
Fairhead & Son	2,758	0	0
Holloway Bros.	2,713	0	0
Moss & Sons	2,640	0	0
Fitch & Cox	2,618	0	0
Moran & Son	2,563	0	0
Nunn & Co.	2,522	0	0
Rigby	2,476	0	0
Nowell	2,423	0	0
Nightingale	2,337	0	0
Paterson	2,292	0	0
Hawkins & Co. (*recommended*)	2,184	0	0

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LONDON—*continued.*

For erection of a new ward block in Upper Road, Plaistow, E., for the Trustees of the St. Mary's Hospital for Women and Children. Mr. A. S. SNELL, F.R.I.B.A., architect, 22 Southampton Buildings, Chancery Lane, W.C.

Sheffield Bros.	£17,451	0	0
Turtle & Appleton	16,335	0	0
Harris & Wardrop	15,992	0	0
Thomas & Edge	15,946	0	0
Symes	15,928	0	0
Mattock & Parsons	15,847	0	0
Brown Bros.	15,812	12	10
Higgs & Hill	15,794	0	0
Jerram	15,700	0	0
Kirk & Randall	15,320	0	0
Luton	15,287	0	0
Maddison	14,919	0	0
Moss	14,862	5	6
Kent	14,912	0	0
Nightingale	14,798	0	0
Fryer	14,471	0	0
Minter	14,433	0	0
Allen & Sons	14,420	0	0
Spencer, Santo & Co.	14,390	0	0
F. & E. DAVEY (*accepted*)	14,337	1	11

For alterations to the police-station at Notting Dale, W. Mr. J. DIXON BUTLER, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard, S.W.

F. & H. F. Higgs	£2,290	0	0
Mowlem & Co.	2,240	0	0
Treasure & Son	2,233	0	0
Minter	2,232	0	0
Holloway Bros.	2,220	0	0
Ansell	2,200	0	0
Higgs & Hill	2,184	0	0
McCormick & Sons	2,090	0	0
Willmott & Sons	2,074	0	0
Lovatt	2,057	0	0
Grover & Son	1,994	0	0
Ashby & Horner	1,988	0	0
Godson & Sons	1,947	0	0

LONDON—*continued.*

For erection of casual wards, for the Bethnal Green Board of Guardians.

Reason	£5,890	0	0
F. & E. Davey	5,787	0	0
Stapleton & Sons	5,761	0	0
Brown Bros.	5,750	0	0
Kirk & Randall	5,745	0	0
Spencer, Santo & Co.	5,690	0	0
Mattock & Parsons	5,677	0	0
Porter	5,647	0	0
Pattinson & Law	5,610	0	0
Appleby & Sons	5,593	0	0
Munk	5,550	0	0
Davey	5,507	0	0
Maddison	5,486	0	0
Nightingale	5,428	0	0
Webster	5,395	0	0
F. & D. Foster	5,328	0	0
Calnan & Son	5,218	0	0
WILLMOTT, Ilford (*accepted*)	5,087	0	0

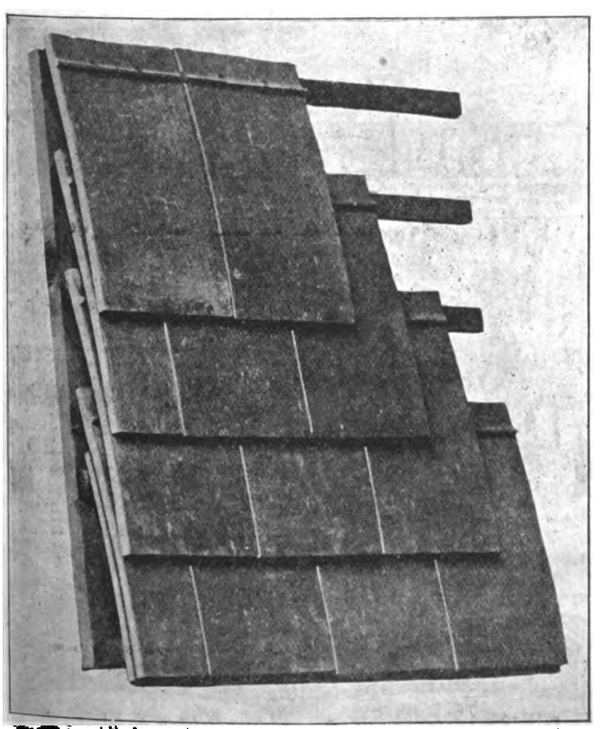
For carrying out a scheme of structural improvements at the York Road school, Islington, for the L.C.C.

Price	£11,366	0	0
Marsland & Sons	11,364	19	4
McCormick & Sons	10,987	0	0
Williams & Son	10,960	0	0
Treasure & Son	10,930	0	0
Wallis & Sons	10,889	0	0
Downs	10,828	0	0
J. & M. Patrick	10,669	0	0
Lole & Co.	10,519	0	0
Patman & Fotheringham	10,486	0	0
McLaughlin & Harvey	10,418	12	3
Kearley	10,261	0	0
L. H. & R. Roberts	10,234	0	0
Godson & Sons	10,221	0	0
Lawrance & Sons	9,845	0	0
Roberts & Co., Highbury (*recommended*)	9,839	0	0
Architect's (Education) estimate	10,200	0	0

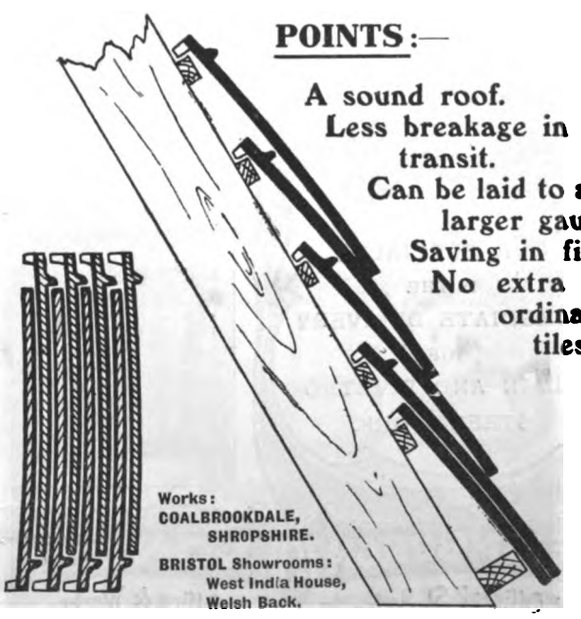
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LONDON—*continued.*

For supplying and erecting additional interlacing wrought-iron railings at Tooting Cemetery, for the Lambeth Borough Council.

Hill & Smith	£724	0	0
Phœnix Art Metal Engineering Co.	640	0	0
Wright	365	8	0
Jones & Sons	340	0	0
Elwood	298	10	0
Bayliss, Jones & Bayliss	255	0	0
Stone (Goosey, successor)	247	10	0
Elwell, Birmingham*	243	12	0
Miller & Sons	229	17	6
McVey	229	15	9
Hayward & Sons	220	0	0
Palmer & Co., Merton Abbey Ironworks, Church Road, Merton, S.W. (*recommended*)	195	0	0

* Work done at Birmingham is piecework.

For alterations to Messrs. Fabbro & Sons' hall, Falcon Road, Battersea, S.W. Mr. HERBERT BIGNOLD, architect, 242 Lavender Hill, S.W.

Nicks	£425	0	0
Hammond	360	0	0
TUCKER (*accepted*)	334	0	0

For the erection of additional conveniences for women at Myatt's Fields and the formation of an entrance to the conveniences from the park.

Lowe & Co.	£188	0	0
A. & F. Polden	142	10	0
F. & G. Foster	123	0	0
Line	105	15	0
Barker & Co., Kensington (*recommended*)	100	10	0

NEW INN.

For erection of a Wesleyan Methodist church at New Inn. Mr. D. C. UDELL, architect, Pontypool.

Partridge	£500	5	0
Burgoyne & Son	435	0	0
Powell Bros.	402	15	0
CAMPBELL, Pontypool (*accepted*)	382	2	6

NORWICH.

For erection of a residence on Upton Road. Messrs. MORGAN & BUCKINGHAM, architects, Norwich.

Youngs & Son	£928	0	0
Hawes & Sons	884	0	0
Gill & Son	883	0	0
Scarles Bros.	865	0	0
Daniels	825	0	0
HAYDEN, Norwich (*accepted*)	798	0	0

OLDBURY (STAFFS).

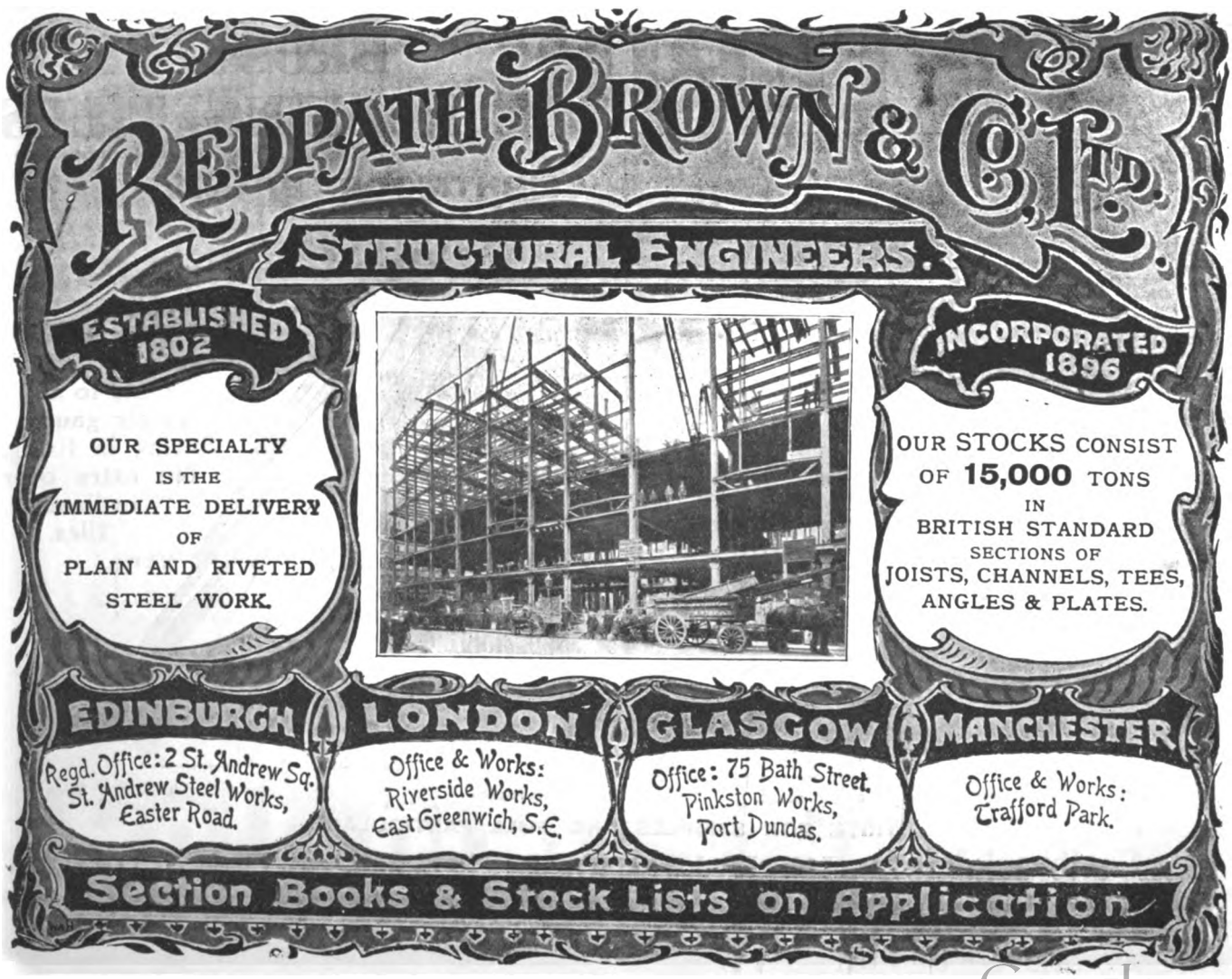
For erection of school at Titford Road, Langley, for the education committee. Mr. J. GILL, architect, Smethwick.

Sapcote & Sons	£14,073	0	0
Bowen & Sons	13,697	0	0
W. J. Webb	13,640	0	0
Barnsley & Sons	13,546	0	0
Willetts & Sons	13,505	0	0
J. Webb	13,470	0	0
Johnson	13,374	0	0
Gough & Son	13,300	0	0
Elvins	13,240	0	0
Round & Sons	12,995	0	0
Webb & Sons	12,969	0	0
Dallow & Sons	12,774	0	0
Jackson	12,763	0	0
Whitehouse & Sons	12,739	0	0
Dorse	12,563	0	0
MARSHALL, Smethwick (*accepted*)	12,237	0	0
Architect's estimate	12,700	0	0

OXFORD.

For additions and alterations to St. Ebbe's School. Mr. H. QUINTON, architect and surveyor, Oxford.

Fathers & Son	£1,057	0	0
Chandler	860	0	0
Horne	849	0	0
Hutchins & Son	825	0	0
Fisher	811	0	0
Simms & Son	775	0	0
Wooldridge & Simpson	739	0	0
KINGERLEE & SONS, Oxford (*accepted*)	648	0	0



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VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON.—INTERIOR OF EAST HALL—INTERIOR OF WEST HALL.

OXFORD COLLEGE SERIES, KEBLE.—HALL AND ENTRANCE—INTERIOR OF HALL.

PEPPARD.

For the erection of a ten-bed ward and laundry, for the Trustees of Maitland Sanatorium. Mr. W. ROLAND HOWELL, F.R.I.B.A., Reading, and 18 Percy Street, W.

Bell & Sons	£1,378 10 0
Trinder & Son	1,210 10 0
Butler	1,198 0 0
Lewis & Bros.	1,180 0 0
The Frazzi Co.	1,175 4 0
Cox, Henley (*accepted*)	1,117 0 0

PURLEY.

For the erection of St. Mark's Church, Woodcote, Purley. Mr. GEORGE H. FELLOWES PRYNNE, F.R.I.B.A., 6 Queen Anne's Gate, Westminster, S.W.

Ansell & Co.	£10.034 0 0
Thompson & Co.	9.253 0 0
Dickens	9.080 0 0
Benfield & Loxley	8.926 0 0
Stewart & Sons	8.918 0 0
Saunders	8.527 0 0
Monk	8.514 13 7
Bowman & Sons	8.522 9 3
J. & C. Bowyer	8.490 0 0
Crossley & Sons	8.357 0 0
Goddard & Sons	8.290 0 0
Jarvis & Sons	8.248 0 0
Denne & Co.	8.210 0 0
Wallis & Sons	8.132 0 0
Lowe & Co.	8.098 0 0
Dove Bros.	8.083 11 0
Longley & Co.	8.045 0 0
Holloway Bros.	7.988 0 0
WILKINS & SONS (*accepted*)	7.974 7 1

MADELEY.

For carrying out a partial restoration of the parish church.

WHITTINGHAM, Newport (*accepted*)	£560 0 0

PORTSMOUTH.

For foundations and buildings to enclose a refuse destructor adjoining the sewage pumping station at Eastney. Mr. C. W. BALL, Q.S.A., surveyor, Southsea. Messrs. HEENAN & FROUDE, engineers, Manchester.

Sweetland	£2,100 0 0
Tanner	1,999 0 0
Croad	1,949 0 0
Salter	1,897 0 0
Crockerell	1,871 0 0
COLTHERUP & WOODS, Portsmouth (*accepted*)	1,857 0 0

RAMSGATE.

For remodelling the sanitation and alterations to the Royal Hotel, Ramsgate. Mr. STANLEY H. PAGE, F.S.I., architect, Ramsgate.

Martin	£1,123 0 0
May	1,120 0 0
Grummant Bros.	1,085 0 0
Turner & Watts	1,075 0 0
DUNN (*accepted*)	1,034 0 0

SALISBURY.

For the construction of brick built water tower and tank and works incidental thereto on the Bishops Down Estate. Messrs. LEMON & BLIZARD, MM.I.C.E., engineers, Salisbury.

Bate & Co.	£921 2 0
Jenkins & Son	820 0 0
Bird & Pippard	820 0 0
Mitchell	810 0 0
Billett & Musselwhite	798 11 8
Douglas	787 0 0
WORT & WAY, Salisbury (*accepted*)	714 7 9
Tryhorn	695 10 0
Brain	650 0 0

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STOTFORD.

For erecting a dwelling-house, &c. Mr. S. REDHOUSE, architect and surveyor, Letchworth.

Morris & Son	£975 10 0
Raban & Sons	856 0 0
BAILEY & SONS, Ashwell (*accepted*)	850 0 0
Phillips	845 0 0
Turner & Sons	804 0 0
Harris	770 0 0

TOTTENHAM.

For the construction of a new road on the Downhills estate, Tottenham, N. Messrs. DAVID BURNETT, SON & BADDELEY, surveyors, 15 Nicholas Lane, London, E.C.

Ballard	£2,271 0 0
Peill & Sons	2,050 0 0
Dunmore	1,910 4 3
Killingback & Co.	1,866 0 0
Hamlett	1,827 0 0
Parry & Co.	1,740 0 0
Rowley Bros.	1,738 0 0
Adams	1,669 0 0
Neave & Son	1,628 0 0
Bell & Sons	1,592 0 0
Kavanagh & Co.	1,587 0 0
Bloomfield	1,570 0 0
W. & C. French	1,455 0 0

WALES.

For Sunday school premises in connection with the Garn Congregational Church, Abercarn, Mon. Mr. R. L. ROBERTS, M.S.A., architect, Abercarn.

Davies & Sons	£2,472 0 0
Charles	2,225 0 0
A. & J. Richards	1,980 0 0
Edwards	1,978 0 0
Leadbeter	1,930 0 0
King & Co.	1,908 0 0
Jenkins	1,897 0 0
Jones	1,884 0 0
W. & D. Thomas	1,867 10 6
COLBORNE, Swindon (*accepted*)	1,745 0 0

WALES—*continued.*

For first section of Y.M.C.A. new building. Mr. WM. GRIFFITHS, architect, Llanelly.

Mercer	£3,599 17 3
Davies & Son	3,550 0 0
Brown, Thomas & John	3,466 10 0
Howell & Son	3,399 0 0
Williams	3,380 0 0
D. W. Davies	3,373 9 7
JONES, Llanelly (*accepted*)	3,300 0 0

WEALDSTONE.

For erection of a foreman's cottage and an engine and tool house at the sewerage outfall works. Mr. H. WALKER, engineer and surveyor.

Dymock & Sons	£505 11 0
Champniss & Co.	455 0 0
Bailey	440 0 0
Richardson	415 5 0
Batchelor	390 0 0
Twinn	389 17 0
W. & A. Whittle	385 0 0
Smith	380 8 0
MOSELEY, Queen's Park, N.W. (*accepted*)	328 0 0

WITHERNSEA.

For new sea-wall, slipway and road—(*a*) constructing wall and road, (*b*) supplying and fixing handrails, for the Urban District Council. Mr. J. H. B. KIRTON, surveyor, Lowgate, Hull.

Langton & Son	£1,243 5 3
Medforth	1,184 6 0
Robinson	1,060 6 9
Brebner & Co.	1,039 8 4
Leggott & Speight	970 11 5
SANGWIN, Hull (*accepted*)	942 2 9

Handrails.

ELWELL, Birmingham (*accepted*)	£35 0 0

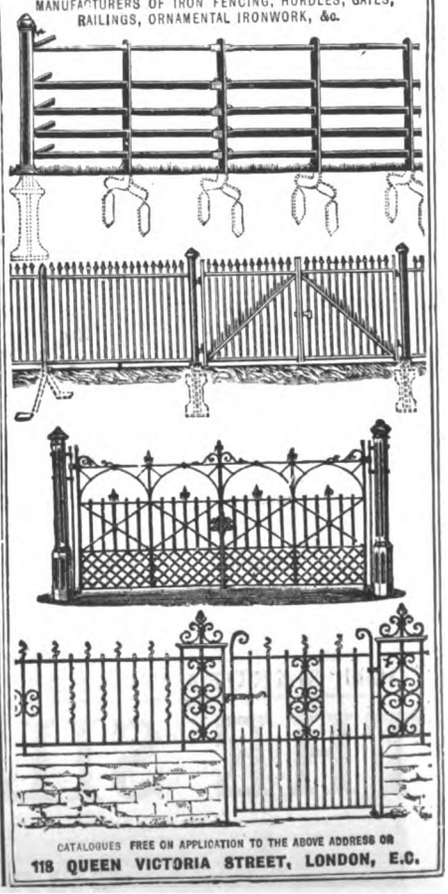
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RECENT TESTIMONIAL.
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WITHERNSEA—*continued.*

For sea-wall—(*a*) concreting path and constructing road and steps. Mr. J. H. B. KIRTON, surveyor.

Brebner & Co.	£594 2 0
Medforth	520 13 2
Armstrong	505 8 3
Robinson	478 12 1
Leggott & Speight	376 8 10
Langton & Son	359 2 3
SANGWIN, Hull (*accepted*)	292 15 3
Burkett & Midgley	291 8 10

For mere land gardens—(*a*) draining and laying out, (*b*) iron fencing and gates, wood fencing, for the Urban District Council. Mr. J. H. B. KIRTON, surveyor, Exchange Buildings, Lowgate, Hull.

LANGTON & SON, Hull (*accepted*)	£245 10 2

Wood fencing.

LANGTON & SON, Hull (*accepted*)	£45 0 0

Iron fencing and gates.

ELWELL, Birmingham (*accepted*)	£88 14 0

For groynes, constructing three timber groynes for the Urban District Council. Mr. J. H. B. KIRTON, surveyor.

Brebner & Co.	£1,328 1 8
Sangwin	799 8 5
Medforth	758 2 10
Robinson	754 3 4
Leggott & Speight	726 3 9
LANGTON & SON, Hull (*accepted*)	679 2 9

WREXHAM.

For school-church, Smithfield, Wrexham, for the Church Extension Committee. Messrs. PROTHERO, PHILLOTT & BARNARD, architects, 13 Promenade, Cheltenham.

Jones	£1,236 0 0
Hughes	1,015 0 0
Williams	1,022 0 0
Collins & Godfrey	970 0 0
Wycherley	950 0 0
Lewis Bros.	947 0 0
SAMUEL, Wrexham (*accepted*)	943 0 0

TRADE NOTES.

MESSRS. PECKETT & SONS, locomotive engineers, Bristol, owing to the large amount of work in the boilermaking department, are increasing the plant by the addition of two electric travelling cranes. Messrs. Peckett & Son have also recently added to the plant of the same department a 200-ton hydraulic flanging press.

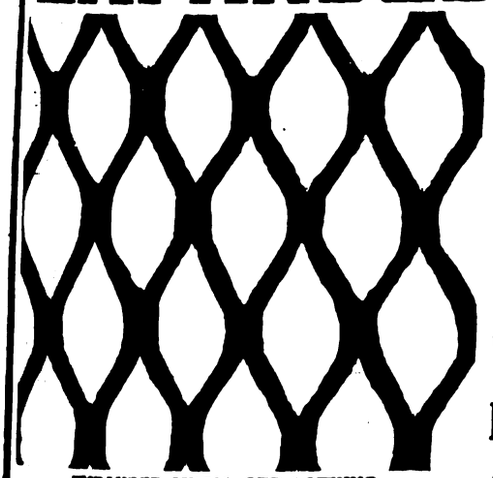
MESSRS. E. H. SHORLAND & BROTHER, of Manchester, have just supplied their patent Manchester grates to the Council schools, Swindon, and to the new cottage hospital at Tullow. The extensions to the new hospital, Dartford, are being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves with descending smoke flues and special inlet ventilators.

MR. HERBERT HOOKEY, a member of Messrs. Douglas Young & Co., auctioneers, has dissolved partnership and commenced to practice in conjunction with Mr. R. E. Hookey at 97 Cannon Street. Mr. Hookey entered the business over twenty-five years ago, and since that date has officiated in the rostrum at many of the important chattel auctions entrusted to the firm, including the realisation of the Newgate Relics and of the Liberator Assets and Hooley Estates, which were successfully carried out a few years ago.

THE heating and ventilating of the Natural History Museum, South Kensington, S.W., has been reorganised; the work in connection therewith was entrusted to the Bright-side Foundry and Engineering Company, Ltd., of Sheffield, and carried out under the supervision of the Chief Engineer to His Majesty's Office of Works.

MESSRS. W. F. STANLEY & CO., LTD., have put on the market "The Essex Calculator." It is designed to enable the engineer to ascertain rapidly and with fair accuracy the rates of velocity and discharge from sewers and water mains, the velocity of discharge in different forms of channel, and, by the introduction of another set of slides, the discharges from gas mains, compressed air mains or steam mains. The calculator is easily adjusted to any of the formulæ in common use, and appears from the directions for use to be simple in working. It is designed by Mr. E. H. Essex, A.M.I.C.E., A.M.I.M.E., and is sold at 7*s.* 6*d.*, or a smaller calculator at 4*s.* 6*d.*

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Belfast—JOHN McNEILL, Ocean Buildings.
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AT Cornhill parish church, Northumberland, a memorial clock and bell to the late Mr. and Mrs. Collingwood, Cornhill House, was dedicated last week, Messrs. W. Potts & Sons, Leeds and Newcastle, being the makers, who are also making the large clock with four illuminated dials for the Royal Grammar School, Newcastle, Northumberland, from the plans of the late Lord Grimthorpe.

THERE are many considerations of supreme importance in the manufacturing world attaching to the locality in which a particular industry may be carried on, and it is no doubt owing to the recognition of this fact that the removal of works and factories from highly rated and congested districts to more suitable places is a frequent occurrence. Amongst the principal factors which have a determining effect upon these migrations may be mentioned the provisions of the new Patent Law, the labour question and rate of wages, and contiguity of ports, coal and iron fields, and centres of population. The vital question of economy of output, so necessary in these days of competition, is materially affected by the choice of locality, and it is claimed that nowhere can these advantages be better secured than in the districts of England and Wales served by the Great Western Railway. Those who would obtain further information on sites procurable in the vicinity of London, the West of England, the Midlands and Wales are asked to apply to Mr. T. H. Rendell, chief goods manager, Paddington Station, W.

WHILE many engineers and architects have not adopted building entirely in reinforced concrete, a large number have recognised the utility of this method of construction in floors, roofs and lintels. The stiffening of floors by the introduction of steel, either in rods, beams or expanded metal, is a general practice nowadays, and even the most conservative members of the professions are departing from the old procedure of forming the heads of openings with timber lintels and relieving arches. Concrete lintels have been found to be more ready and durable, and for spans which exceed the width of an ordinary door or window opening tension rods of steel are frequently inserted in the lower section of the beam. The Trussed Concrete Steel Company, Ltd., of Caxton House, Westminster, have placed upon the market a complete lintel reinforcement on the Kahn bar principle, and for flat-headed openings this Kahn trussed lintel is decidedly advantageous, as by its introduction the surrounding concrete is considerably strengthened. Although their published list only illustrates and details particulars of the eighteen standard types of lintels, it is claimed that spans up to 40 feet are as feasible as those of 10 feet, although in the former case it is recommended that the company's engineers should be directly consulted. The list is an indication of what may perhaps be termed the decentralisation of reinforced concrete construction, which enables the architect or engineer to employ it in certain portions of his works, in instances where a structure entirely erected of reinforced concrete would not suit the requirements of himself or his client.

VARIETIES.

THE Army and Navy Auxiliary Co-operative Supply, Ltd., have obtained the sanction of the London County Council for the erection at their premises in Howick Place and Francis Street of a fourth storey addition to be used as a store-room only.

MR. WALTER ARMSTRONG, constructional engineer to the Great Western Railway Company, has been appointed engineer to advise the Reading Corporation upon the most suitable site for an additional bridge across the Thames for vehicular traffic, and to prepare an estimate of the probable cost.

AT Falkirk Dean of Guild Court plans were unanimously approved for the erection in Hope Street, Falkirk, of a theatre to be known as Falkirk Hippodrome. The plans showed a commodious building having seating accommodation for 1,800 persons. The three tiers will be constructed on the cantilever principle.

THE Wood Green District Council has decided to apply for sanction to borrow 31,150*l.* for the purpose of obtaining a bulk supply of electricity and distributing it to consumers. Five years ago the Council asked the Local Government Board for a loan of 40,000*l.* to generate and supply electric light, but the Board refused the application.

THE sewage committee of Glasgow Corporation recommend the Town Council to accept the offer of Messrs. William Beardmore & Co., Ltd., Dalmuir, to construct for them an additional sludge steamer in connection with their sewage precipitation works. Ten offers were received. That of Messrs. Beardmore amounted to 25,550*l.*

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Bexhill	14/0	10/6	8/0	Margate ...	16/0	12/0	8/0
Boulogne ...	30/0	25/0	17/10	Ostend	31/6	23/6	13/8
Broadstairs ...	16/0	12/0	8/0	*Paris	45/0	27/6	20/0
Calais	31/6	26/6	20/6	Ramsgate ...	16/0	12/0	8/0
Canterbury ...	14/0	10/6	8/0	St. Leonard's ...	14/0	10/6	8/0
Deal	18/6	12/6	9/0	Sandgate ...	17/6	12/6	9/0
Dover	17/6	12/6	9/0	Sandwich ...	18/6	12/6	9/0
Flushing	30/5	18/10	—	Sherncliffe ...	17/6	12/6	9/0
Folkestone ...	17/6	12/6	9/0	Tun. Wells ...	8/6	5/6	4/6
Hastings ...	14/0	10/6	8/0	Walmer	18/6	12/6	9/0
Herne Bay ...	14/0	10/0	7/0	Westgate ...	16/0	12/0	8/0
Hythe	17/6	12/6	9/0	Whitstable Tn.	14/9	10/0	7/0

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THE municipal buildings committee of Glasgow Corporation are considering an estimate by Messrs. Douglas, Hunter & Whitson, in which they state that the approximate cost of the proposed alterations on the second floor of the Municipal Buildings will be about 3,000*l.*, including all necessary fixtures and repainting, but not furnishings. If the larger scheme be carried out the additional cost will be about 1,200*l.*, or a total of 4,200*l.*

MESSRS. LAW & HARRIS, architects, Northampton, report of the tower and spire of the Kingsthorpe parish church:—"The top stone of the spire, immediately under the finial, is cracked and is in a most dangerous condition; there is also a very ominous fissure a little below this stone. It is, in our opinion, absolutely necessary that the top of the spire be taken down for a distance of about six feet and rebuilt."

THE committee of the Royal Alexandra Hospital, Rhyl, have let the contract for building the wing for convalescent patients which is required to complete the hospital buildings, and the work is to be put in hand at once. The contractors are Messrs. Morrison & Son, of Wavertree, Liverpool, who are building the Liverpool Cathedral, and they have undertaken to complete the work in eleven months. The total cost is estimated to be about 14,000*l.*

AN application was made and plans submitted by Mr. Oliver, architect, last week, for the erection of a new grand stand and other improvements to be carried out at Molineux Grounds, Wolverhampton. It is proposed to build the grand stand on the terrace portion of the grounds to accommodate visitors at football matches. The cost will be 500*l.* The application was granted to the Wolverhampton Wanderers Football Club.

MR. JOHN GALLIMORE, Newcastle-under-Lyme, has died at the age of eighty-one. For many years he was the leader of the Liberal party in the borough. In 1879 he was Mayor, for twelve years he was Chairman of the School Board, and for a quarter of a century he was Chairman of the North Staffordshire Master Builders' Association. As a young man he built a church at Odd Rode, Cheshire, and, incurring losses by the undertaking, he made a composition with his creditors. Years afterwards he paid them all in full with interest. He was known as "Honest John."

FRASERBURGH Town Council have under consideration an extensive new water supply scheme. Mr. W. Allan Carter, C.E., Edinburgh, has prepared a report on the proposal. The water is to be taken from Fedderate, New Deer, a distance of fifteen miles from Fraserburgh. The estimated total cost of the undertaking is 45,800*l.*, which includes the making of a reservoir capable of containing 51,000,000 gallons or a ten weeks' supply for the town. The daily supply available from the new source would be 690,000 gallons.

THE Bromley Urban Council have approved a scheme for the erection of a fire station for self-propelled fire appliances, the provision of those appliances, and the erection of men's quarters adjoining. The estimated capital expenditure was put at 5,005*l.*, 3,855*l.* of this being for buildings and the remaining 1,150*l.* for providing a self-propelled fire engine and a first-aid machine. The estimated annual expenditure, in the event of the adoption of this scheme, is 957*l.*, or, if the suggestion that the engine be drawn by horses be agreed to, 1,045*l.* Detail plans and quantities are to be prepared.

THE Doncaster Rural District Council have instructed Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne, to report on a scheme of main sewerage for the 776 houses proposed to be built for Bentley Colliery, and also further developments up Askern Road and Bentley. The scheme consists in the laying of considerable lengths of cast-iron pipe sewers on concrete foundations and the construction of a pumping-station, which will include a storage tank, from which the sewage will be pumped by means of electric motors and centrifugal pumps to the disposal works.

MR. H. R. HOOPER, an Inspector of the Local Government Board, held an enquiry at the Council House, Birmingham, last week, into an application made by the City Council to the Local Government Board for sanction to borrow 149,350*l.* for purposes of the electric supply undertaking, 16,600*l.* for works of paving, and 2,200*l.* for works of sewage. Mr. Prideaux, in making the application, dealt first with the 149,350*l.* loan. He said that 100,000*l.* of that amount was required for an extension of the underground mains, rendered necessary by the rapid increase in the demand for electrical current in the city.

MR. LLOYD-GEORGE received on the 2nd inst. a deputation from the Garden City Association, which placed before him

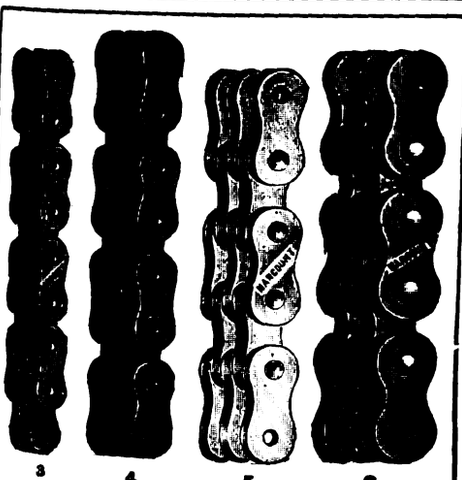
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The New Lunatic Asylum, Bristol.
The Houses of Parliament, Brisbane.
The Holborn Viaduct Buildings, London.
The New Library, Pollokshields.
The Asylum, Letterkenny.
The Dykebar Asylum, Paisley.
The Metropolitan Carriage Works, Saltley.
The Royal Artillery Barracks, Manchester.
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the points on which it was thought that the Budget would affect garden city schemes. One of the points urged was that land which was not built upon in accordance with the settled plan of development should not be treated as undeveloped land for the purposes of the tax, although no buildings are erected upon it. Another suggestion the Chancellor of the Exchequer was asked to consider was that every provision should be made to ensure that the carrying out of a town-planning scheme should not entail loss by the owner consequent on his leaving the land unbuilt upon. Mr. Lloyd-George replied to the deputation, but his reply is to be regarded as confidential.

THE award of Mr. A. A. Hudson, the arbitrator appointed to settle the dispute between the Master Builders' Association and the various operative societies in Southampton and district has been issued, and the new and revised rules came into force on the 2nd inst. The most important alterations made in the rules by Mr. Hudson are that the working hours are now reduced to a fifty-three-hour week, viz., cease work at 5 p.m. for the first five days, and noon on Saturday. The wages remain as present. With regard to the rule for overtime, the first two and a half hours of overtime will be paid at the rate of time and a quarter; after that till starting time next morning the rate will be time and a half. This does away with the double time for night work. The carpenters are allowed one and a half hours' notice in place of one hour, as previously. There is no alteration in the walking time rule. There is a new rule inserted for settling all disputes within ten days, failing which either side may apply to the Board of Trade to appoint an arbitrator, whose decision shall be final and binding to both parties concerned. This clause comes in force on August 2, unless either party shall give notice to the other in writing that such rule is not agreed to.

THE London County Council, in October last, authorised expenditure of 25*l*. on the preparation of a scheme for the centralisation of the hot-water system at Cane Hill Asylum. The scheme, which has now been prepared, provides for the construction in the water-tower of a large central tank for the storage of hot-water, from which services will be taken to all points where supplies are needed. A series of thirty-six storage tanks located in the roof spaces of the wards, in which water is heated at present by live steam brought from the boiler house, will be put out of use. Heaters and circulating pumps to give the necessary temperature to and circulation of the water in the mains are to be installed in a central position in the vicinity of the water-tower. The cost of the work, which it is proposed to have carried out partly by contract and partly by labour employed directly under the supervision of the asylums engineer, is estimated at 3,600*l*. At present the weekly expenditure in coal consumption at Cane Hill Asylum averages 3.09*d*. per patient in excess of similar expenditure at the other large London county asylums, and this fact is attributed solely to the antiquated method of hot water distribution. The quantity of steam coal used averages 3,500 tons a year and costs about 4,200*l*. It is expected that a reduction of at least ten tons a week, or 520 tons a year, will be effected as a result of the proposed re-arrangement. At Claybury Asylum where similar work has been done, an even greater saving than this has resulted.

AT the invitation of the directors of the Golden West and American (U.S.A.) Industries Exhibition, a party of gentlemen last month inspected the industrial and commercial exhibits, to which there have been many recent additions. The visitors were conducted over the exhibition by Mr. Hartley, Mr. Hart and Mr. Garnett, and Mr. J. W. Ryckman, the commissioner for the United States. It has been estimated that the exhibits represent capital actively engaged in industries, railroads and development enterprises in the United States amounting to over 300,000,000*l*. The most recent addition is the installation by the Southern Pacific Railway Company in the Royal Galleries of a pictorial exhibit of the beauties, wealth and potential resources of the southern and south-western portions of the United States. The walls are covered with large photographs of scenes taken along the lines of the Southern Pacific and its associated companies. Half-hour "talks," profusely illustrated by means of both still and animated pictures, are given each afternoon and evening, admission to which is free.

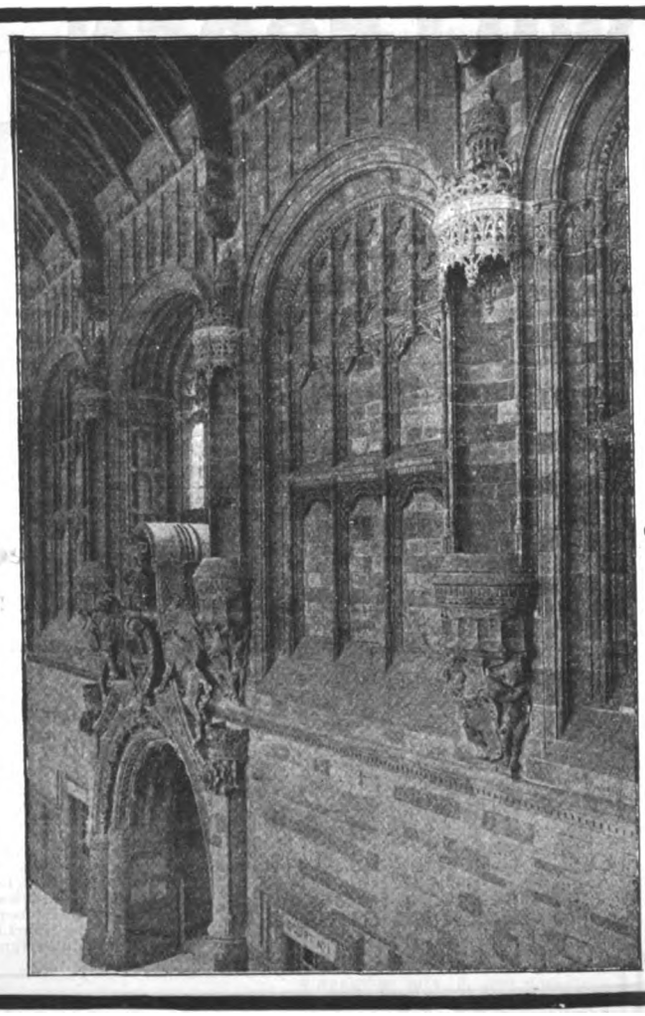
A LARGE number of City men in connection with the Central Y.M.C.A. have planned the erection of new headquarters for the Y.M.C.A. which shall include technical college and hostel. This is to be erected on an island site in the Tottenham Court Road at a cost of 140,000*l*., of which

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there remains about 80,000*l.* yet to be obtained. The building will prove the finest of its kind yet erected in the British Isles, and a distinct acquisition to the Metropolis, with its handsome façade. Two of its important departments consist of (1) a business man's college and (2) a hostel for young men. In the former, which is to be located on the second floor, a completely equipped educational department is to be installed for supplying the needs of young professional and commercial men. Provision is being made for a laboratory, class-rooms, reference library and lecture-rooms. The department is to be placed under the control of a fully qualified director of education, who will plan the syllabus in order to secure the maximum of assistance to the students for the London University or Civil Service examinations, and also for specialised courses of study in banking, insurance, accountancy, architecture, shipping and forwarding, as well as the textile industries and other trades. The committee hope to make it possible for the young man to receive guidance not only as to his studies but also respecting his future business or profession. The accommodation for the hostel will be provided in the upper floors where 200 bedrooms are to be reserved at a moderate rent for young men desiring comfortable lodgings.

THE LONDON ASSOCIATION OF MASTER DECORATORS.

THE first annual general meeting of this Association was held at the Holborn Restaurant on Monday, June 7, when a large number of members were present. The meeting was a most successful one, and the President, Mr. H. A. Campbell, made some interesting statements as to the useful work done by the Association during the first year of its existence, and dealt at considerable length with the work which it has in hand for the current year.

The following office-bearers were re-elected:—President, Mr. H. A. Campbell (Campbell, Smith & Co.), 25 Newman Street, W.; Vice-President, Mr. John Anderson, 4 Clareville Grove, South Kensington; Treasurer, Mr. J. J. Honeychurch, 30 Queensdale Road, Holland Park, W.; and the following gentlemen were elected to fill the vacancies arising on the committee in accordance with the rules:—H. H. Holliday, 1 Harrington Road, South Kensington; F. De Jong, 84 Albert Street, Camden Town, N.W.; C. E. Wilkinson, 49 Marloes Road, Kensington; R. Salisbury (Salisbury & Co., Ltd.), 69 Walton Street, S.W.; William Morris, Ruskin House, Rochester Row, Westminster, S.W.; H. W. Sanders, 92 Crawford Street, W.; W. J. Renshaw, 287 Upper Richmond Road, Putney, S.W.; Chas. Saul (Messrs. Johnson, Saul & Co.), 36 Thurloe Place, S.W.

The other members of the committee (who remained in office) are:—F. Dakin, 151 Upper Richmond Road, Putney, S.W.; A. Andrews (Jones & Andrews), Crescent Works, Beckenham, Kent; A. Campbell (Campbell & Christmas), St. Oswald's Studios, West Brompton, S.W.; F. Charman (Charman & Walton), 30 Wells Road, Sydenham, S.E.; F. Chesterton (G. & A. Brown, Ltd.), 167 Hammersmith Road, S.W.; G. Colley (B. Colley & Sons), 135 & 137 Portland Road, S.W.; R. W. Jeffries (W. Jeffries & Sons), Crawford Street, W.; C. W. Patten, 35 Great Ormond Street, W.; T. S. Rowden (Rawlings Bros., Ltd.), 82 Gloucester Road, S.W.; Herbert Sheppard (Sheppard Bros.), Snakes Lane, Woodford Green; H. Stephens (Stephens & Son), 13 Hill Street, Woolwich; Henry E. St. John (J. H. St. John & Sons), Seymour Place, W.; Arthur Webb, Langthorne Works, Romford Road, Stratford, E.

The first annual dinner of the Association was held under the presidency of Mr. H. A. Campbell at the Holborn Restaurant on Thursday, June 10, when about fifty members and a few friends were present. Amongst the guests were Mr. J. D. Crace, President of the Incorporated Institute of British Decorators; Mr. J. Puttrell, President, and Mr. W. G. Sutherland, Secretary, of the National Association of Master House Painters and Decorators.

Mr. Alexander Davidson, 21 Finsbury Pavement, E.C., the Secretary of the Association, will be glad at all times to hear from any member of the trade who may think of joining the Association, and to give them any information they may require.

A NEW elementary school at a cost of about 14,000*l.* is to be erected at Winton, Bournemouth.

CONSIDERABLE activity is to be observed in the building trade at Torquay. The town is extending rapidly in the direction of Paignton.

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AN OPEN WINDOW SCREEN.

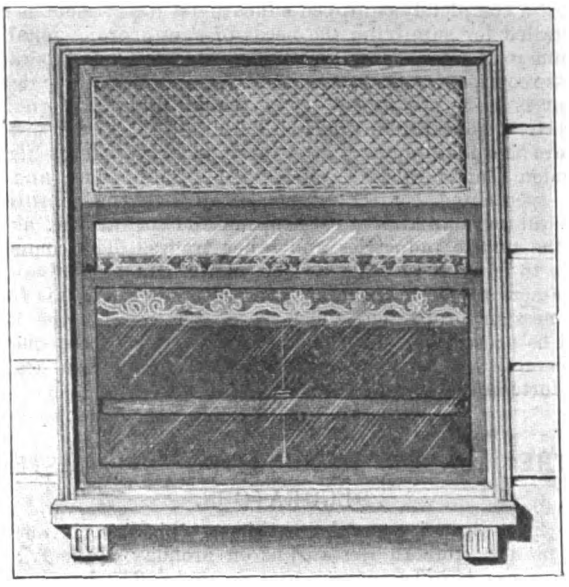
THE growing cult of the open bedroom window received something of a check when a short while ago some learned scientists were emphatic in their demonstrations that the ingress of night air was accompanied by grave risk. The view offered was that during the day the sunlight counteracted the poisonous gases, but that at night these arose unopposed, and made their way wherever opportunity offered. Apparently they derived particular satisfaction from entering the apartments of those who were lulled to sleep in the blissful belief of hygienic surroundings. Whether this theory be correct or not it is undeniably true that the open window, whether of bedroom or living room, does admit other things besides health-giving ozone—damp, for instance, and smut, not to mention fog and rain. In spite of these troubles the hatred of a stuffy atmosphere generally proves victorious, and the window is consequently left open at the top.

What we now illustrate is a device which allows pure air to enter unchallenged, while offering the stoutest resistance to everything else. Its full name and description is



"Morris's Sanatorium Window Screen—a screen consisting of a frame wherein are mounted two adjacent panels of perforated or reticulated material, between which is disposed a sheet of foraminous material." In our illustration one of the wicker-work panels has been dropped on its hinges so as to show the inside where the gauze or muslin is fixed. It is this stretched material that acts as the filter; it can be renewed as often as necessary at an infinitesimal cost. The rest of the screen has nothing that can wear out or get out of order. It is quickly hooked into the window frame.

Our second view shows from the outside the screen inserted into the upper part of the casement. To obtain full benefit, the top of the blinds and curtains would be below the screen, so as to afford an uninterrupted passage to the air when the top sash is lowered.



SCREEN FITTED INTO SASH WINDOW.

In the case of hospitals and sanatoria the screen can be made of a size to fill the entire window so as to allow the maximum quantity of filtered air to enter. This very simple invention is also cheap, for there is nothing in it to cost money in the making. A domestic improvement of this kind might never occur to a masculine mind, and the credit of producing it is to be given to a lady, Mrs. Harry W. Morris, 241 Ardgowan Road, Catford, S.E. We understand arrangements are in progress for its manufacture on an extended scale.

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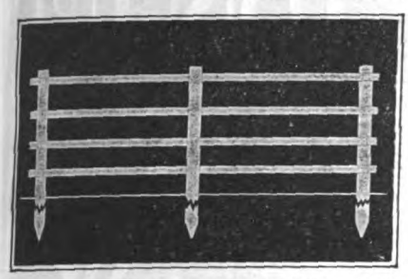
Was used on practically the whole of the interior wall surface of the

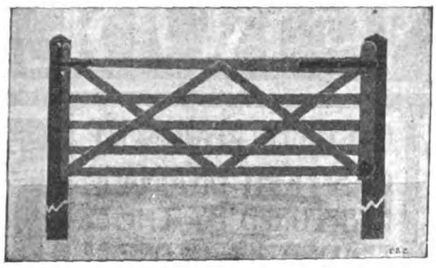
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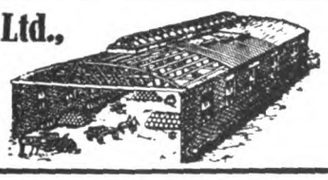
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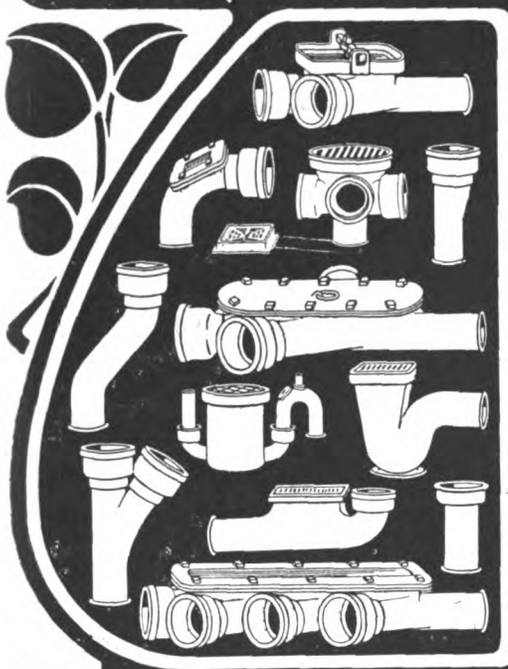
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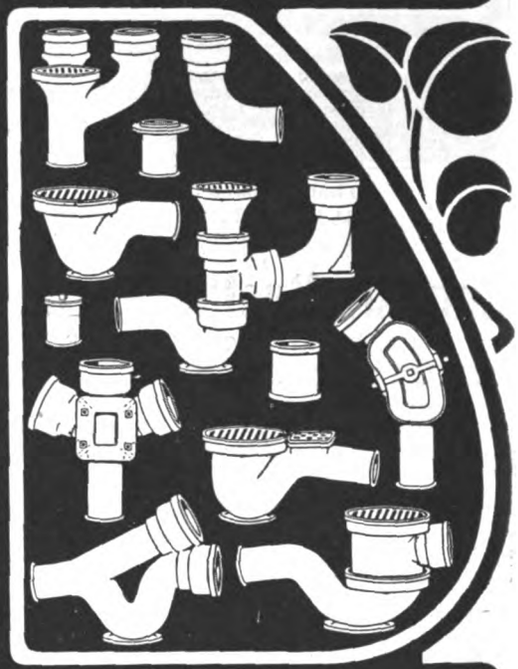
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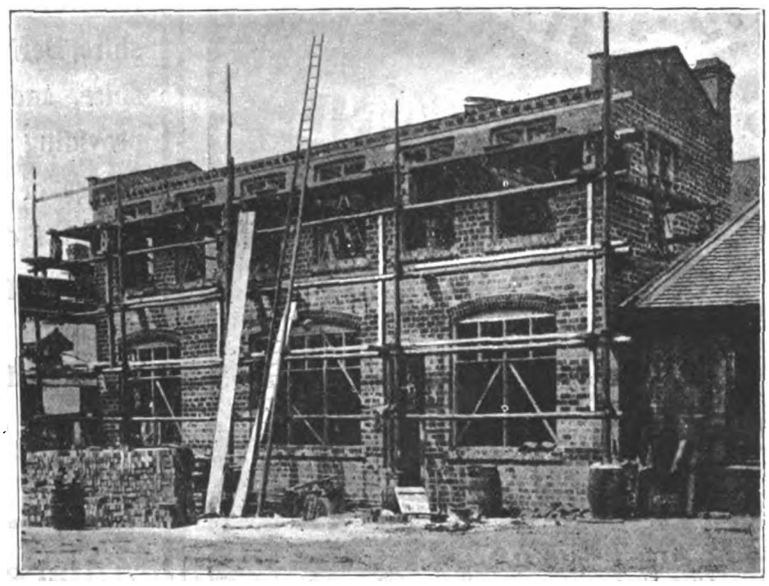


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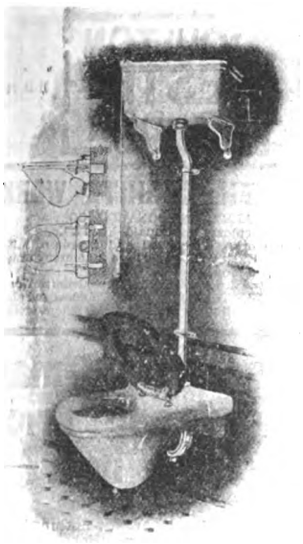
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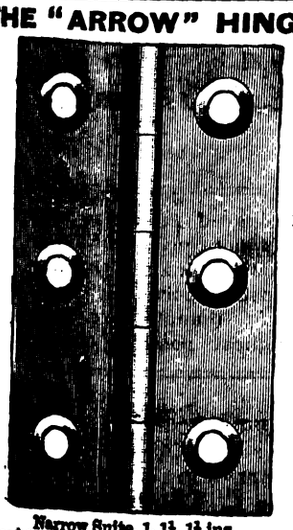
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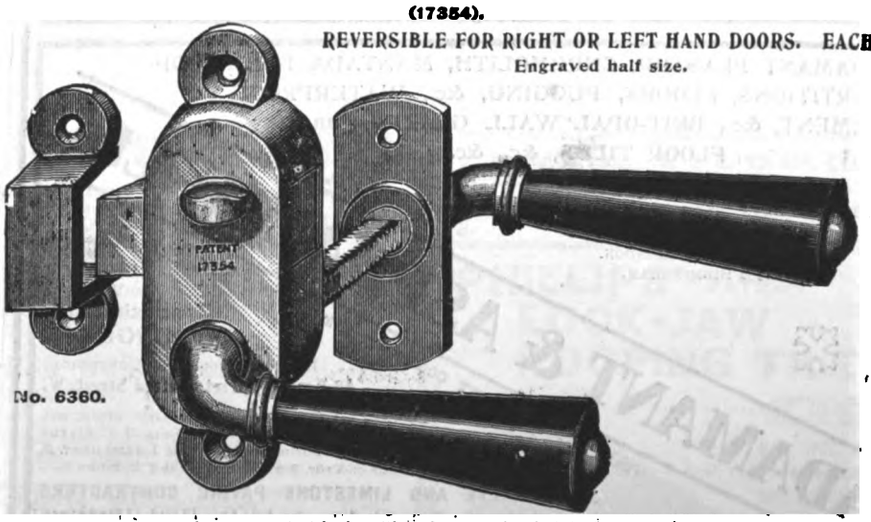


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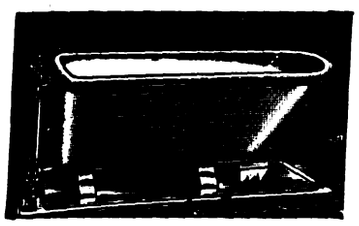
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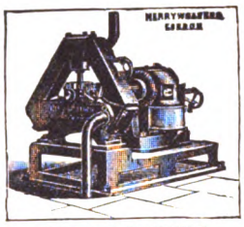
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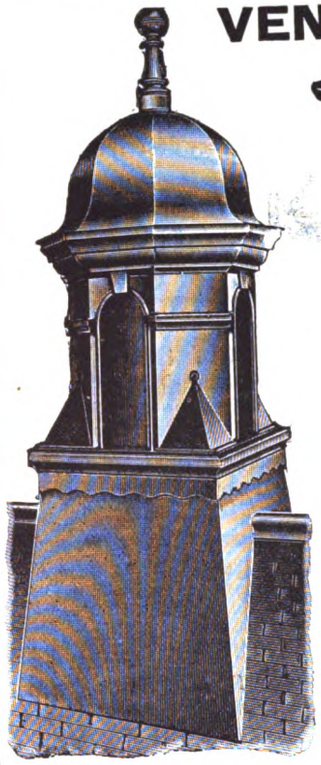
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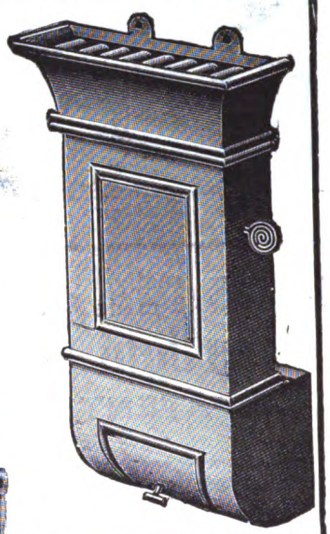
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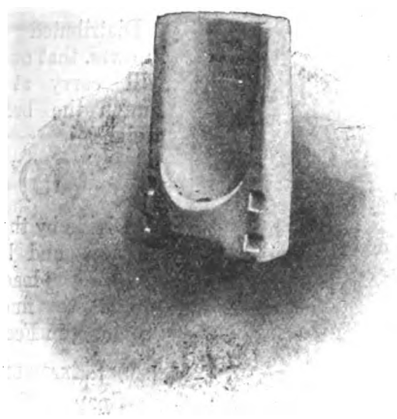
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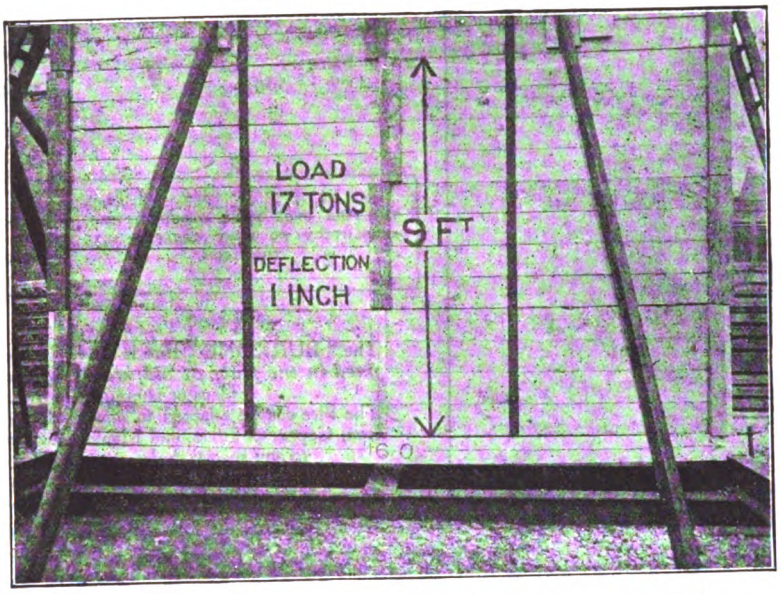
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are lattice girders minus compression web members, and in combination with concrete are more than double the strength of joists of equal weight.

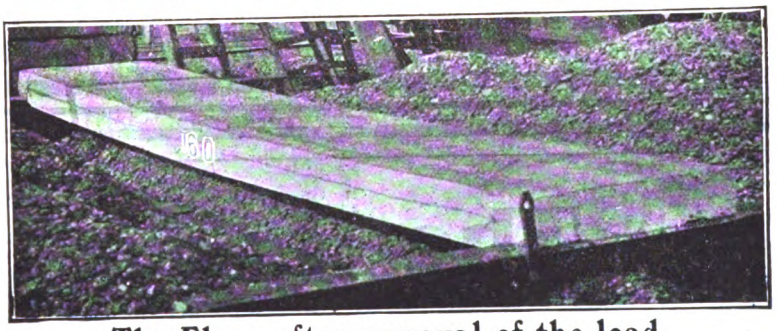
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(63)

Divide by the span in feet and by the working load in cwts. to find the Spacing in Feet.

EXAMPLE.

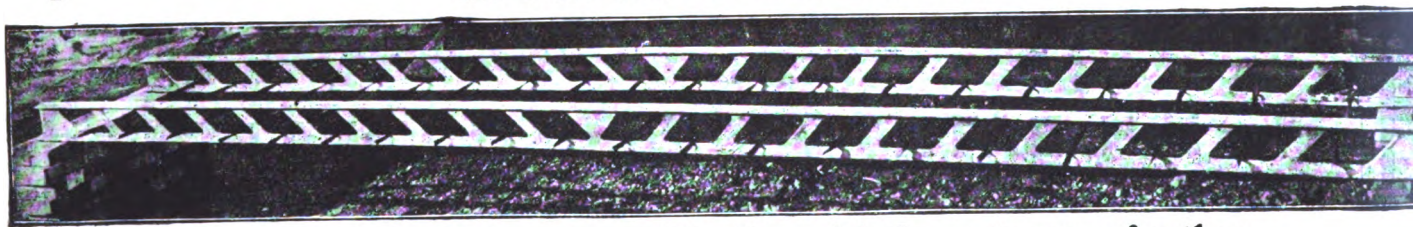
Span 15 Feet.

Load 1½ cwts. per foot.

15)63·0(4·2
60
30
30

1·5)4·2(2·8
30
120
120

Or about 2′ 9″ to 2′ 10″ Centres.



Mon'lithcrete Girders in combination with Concrete are safer than Reinforcing Bars.

"The general results of the tests must certainly be considered as highly satisfactory, and as substantiating the claims put forward on behalf of this method of floor construction in respect of strength and rigidity."—THE BUILDER, February 20, 1909.

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"The aim of the inventor, Mr. Mark Fawcett, has been to obtain monolithic construction not by using concrete reinforced by bars and loose or fixed stirrups, but by using what might be described as lattice girders from which the compression members have been removed; in other words, rolled steel girders with large rhomboidal-shaped openings in the webs and tension bars pitched at an angle of 45° to the right and left of the centre, leaving the webs solid at each end to resist shear, whilst the top flanges are reduced to two-thirds the sectional area of the bottom flanges.

"The result is that the steel beams, reduced in weight 40 per cent. from the British standard, are capable of carrying at least 50 per cent. more load. The new floor has besides the advantage that an aggregate, as broken brick, can be used for the concrete, possessing greater resistance to fire and less conductive of sound than ballast concrete ordinarily employed in reinforced work."—THE ARCHITECT, February 26, 1909.

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The Contract Reporter.

to The Architect.

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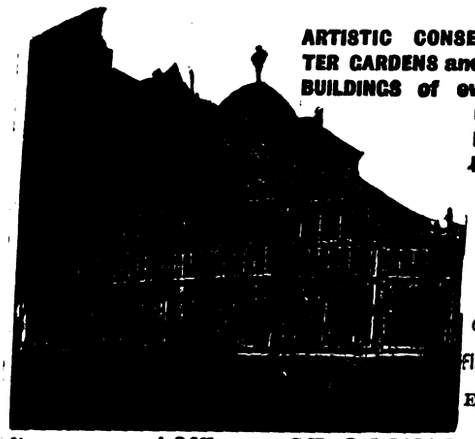
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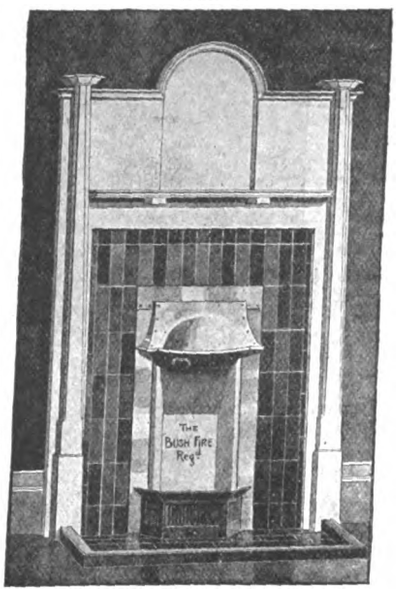
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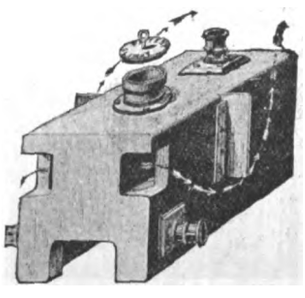
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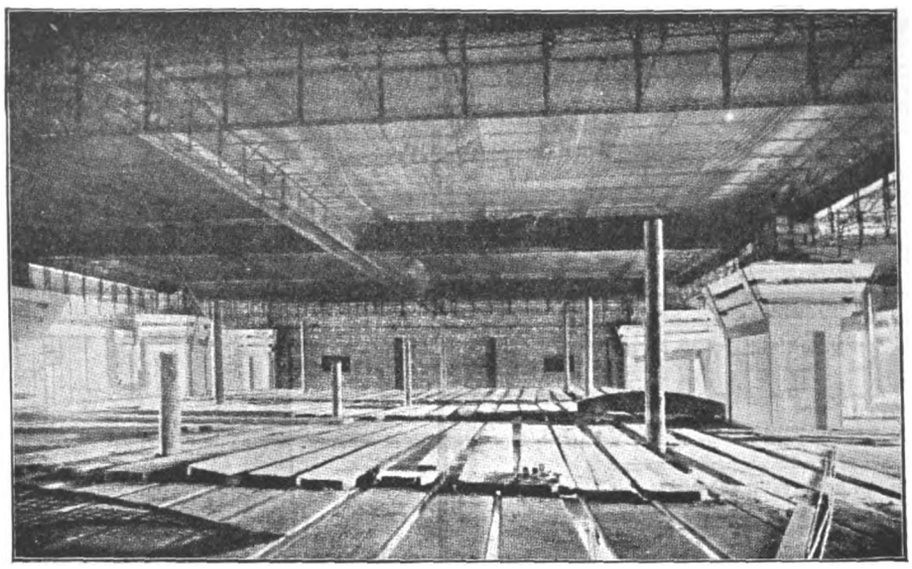
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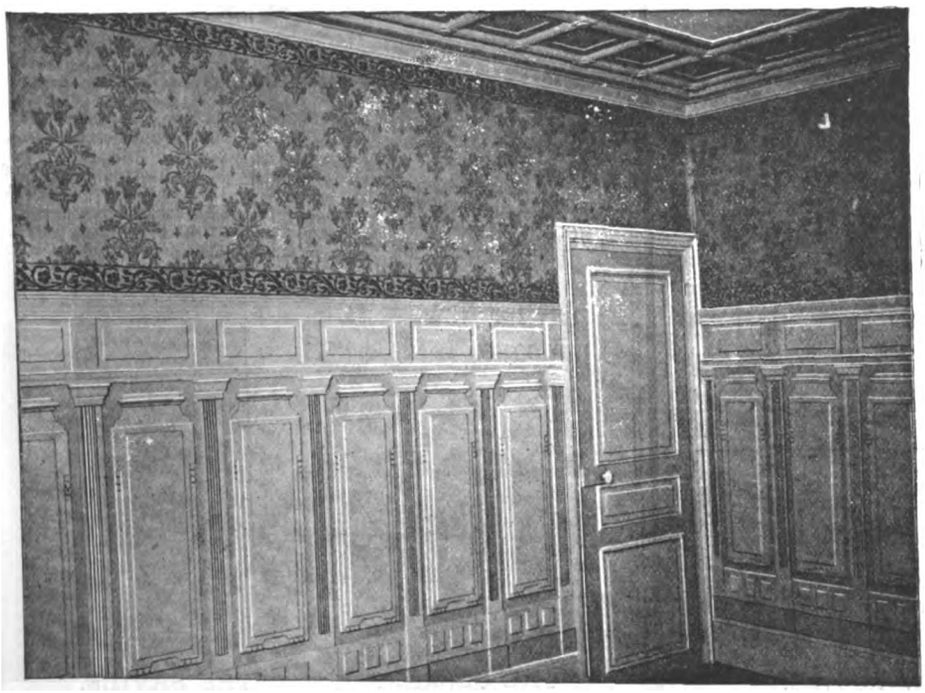
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Architect and Contract Reporter.

FRIDAY, JULY 16, 1909.

Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s 6d. All business communications to the Managing Director,

P. A. GILBERT WOOD,

Publishing Offices, 6–11 Imperial Buildings, Ludgate Circus, London, England.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

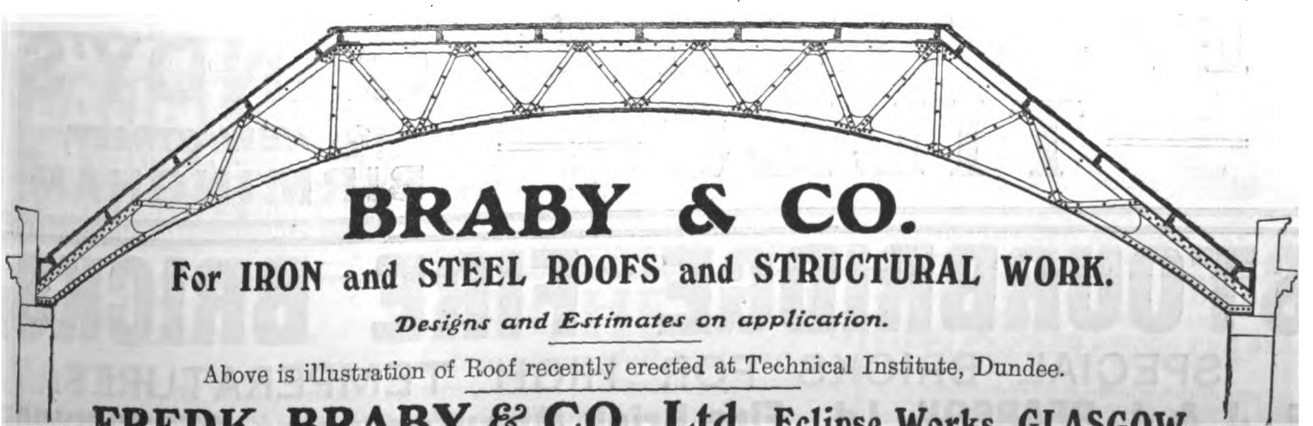
BURSLEM.—July 17.—For new public buildings. The author of the design placed first by the assessor will carry out the work. The architects placed second and third will receive premiums of 100*l.* and 50*l.* respectively. Deposit 2*l.* 2*s.* Mr. F. Bettany, borough surveyor, Burslem.

DEPTFORD.—Sept. 1.—The Metropolitan Borough Council of Deptford invite designs for a branch library at New Cross, S.E. Premiums of 50 guineas, 25 guineas and 10 guineas will be awarded. Assessor, Mr. J. S. Gibson, V.P.R.I.B.A. Deposit 1*l.* 1*s.* Competition is limited to architects practising in the city or county of London. Mr. Vivian Orchard, Town Clerk, Town Hall, New Cross Road, S.E.

FOREST HALL.—The local education committee invite designs from architects practising in the county of Northumberland and in Newcastle-on-Tyne for a public elementary school to accommodate 250 scholars. Mr. C. Williams, secretary, The Moot Hall, Newcastle-on-Tyne.

GLASGOW.—July 31.—The patrons of the Royal Incorporation of Hutchesons' Hospital invite designs for laying out for feuing and building about 195 acres of their lands of Thornliebank, Eastwood. Premiums of 100*l.*, 75*l.*, 50*l.* and 25*l.* will be awarded. Deposit 3*l.* 3*s.* Messrs. Hill & Hoggan, 194 Ingram Street, Glasgow.

GRIMSBY.—July 30.—For the extension of the town hall, at an estimated cost of 26,000*l.* Premiums of 250*l.*, 150*l.* and 100*l.* will be awarded. An eminent architect will act as assessor in conjunction with the borough engineer. Deposit 2*l.* Apply to Mr. H. Gilbert Whyatt, A.M.I.C.E., borough engineer, Town Hall, Grimsby.



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HUDDERSFIELD.—Aug. 31.—Plans are invited for a church to seat 400, to cost about 2,000*l.*, not to exceed 2,500*l.*, with all fittings, furnishings, lighting and heating apparatus. The Rev. D. Macrae Tod, B.D., St. James's Manse, Huddersfield.

HULL.—Sept. 20.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

READING.—July 31.—The Berkshire County Council invite designs for offices, committee rooms, &c., on the Forbury, Reading. Mr. Mervyn Macartney, F.R.I.B.A., assessor. Premiums of 100*l.*, 75*l.*, and 50*l.* Deposit 1*l.* 1*s.* Apply to Mr. J. Fred Hawkins, county surveyor, Bank Chambers, Cross Street, Reading.

WALES.—Oct. 1.—The Urban District Council of Aberdare invite competitive designs for a fever hospital for fifty-two patients, including administrative block, outbuildings, &c. Premiums of 100*l.*, 50*l.* and 25*l.* An assessor will be appointed on the nomination of the President of the R.I.B.A. Deposit 3*l.* 3*s.* Mr. T. Phillips, clerk, Town Hall, Aberdare.

WHITBY.—July 30.—The North Riding of Yorkshire County Council education committee invite designs for a secondary school. Mr. Paul Waterhouse, assessor. Apply to the Secretary, Education Offices, County Hall, Northallerton.

CONTRACTS OPEN.

ASPULL.—July 27.—For erection of an elementary school for infants at Aspull, near Wigan, for 300 scholars. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

BARTON MILLS.—July 20.—For repairs to the Mill Bridge, Barton Mills, West Suffolk. Mr. A. Ainsworth Hunt, county surveyor, Shire Hall, Bury St. Edmunds.

BEDFORD.—July 29.—For erection of additional offices and Council Chamber, forming an extension of the Shire Hall. Deposit 2*l.* 2*s.* Send names to Mr. H. P. Adams, architect, Shire Hall, Bedford.

BELFAST.—July 28.—For erection of a weighbridge office, bridge pit, &c., and the erection of an existing weighbridge on the Donegall quay, for the Belfast Harbour Commissioners. Mr. W. Redfern Kelly, M.I.C.E., harbour engineer, Harbour Office, Belfast.

BIRKENHEAD.—July 26.—For alterations and additions to the bakery at the Birkenhead Union Workhouse. Deposit 2*l.* 2*s.* Messrs. E. Kirby & Sons, architects, 5 Cook Street, Liverpool.

BISHOP'S STORTFORD.—July 29.—For erection and completion of a high school for girls. Deposit 2*l.* 2*s.* Send names by July 17 to Messrs. Talbot, Brown & Fisher, architects, Wellingborough.

BOLTON.—July 28.—For erection of (*a*) the Astley Bridge and Great Lever branch libraries. Messrs Bradshaw & Gass, F.R.I.B.A., architects, 19 Silverwell Street, Bolton. (*b*) The Halliwell branch library. Messrs. Henderson & Brown, architects, Fold Street, Bolton.

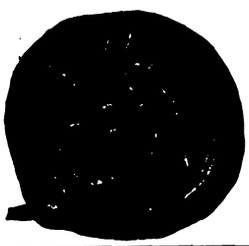
CHICHESTER.—July 27.—For erection of public elementary schools in Orchard Street. Deposit 2*l.* 2*s.* Send names by July 18 to Mr. Haydn P. Roberts, A.R.I.B.A., county education architect, Education Offices, Horsham.

COVE AND HAWLEY (HANTS).—August 9.—For erection of a Council school for 140 children at Cove. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

CROYDON.—July 19.—For the construction of (*a*) repair shop; (*b*) mess-room, &c., at the Electricity Works, Factory Lane, Croydon. The Electricity Works, Factory Lane.

DURHAM.—July 20.—The County Council invite sole tenders (1) for new higher elementary school and pupil teacher centre at Tanfield Lea, new Council school at Bloemfontein, and (2) alterations at Willington and Collierley Council schools. (1) Mr. W. Rushworth, Shire Hall, Durham; (2) Mr. F. E. Coates, Shire Hall, Durham.

EDINBURGH.—July 21.—For the following works, viz.:—(1) Builders' and engineers' work of alterations at Turkish bath, Warrender baths; (2) builders' work and weighing machine at alterations on property at Hamilton Place; (3) condensation pipes from boiler, &c., at wash-houses,



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Allan Street, for the Town Council. Mr. James A. Williamson, A.R.I.B.A., Public Works Office, City Chambers.

EDINBURGH.—July 24.—The Magistrates and Council invite tenders in one sum for the whole trades, viz.:—mason, joiner, plumber, plasterer, slater, glazier, tile layer, steel, and iron works, for proposed restaurant at New Markets, Gorgie. Deposit 3*l.* 3*s.* Mr. James A. Williamson, A.R.I.B.A., Public Works Office, City Chambers.

EDINBURGH.—July 17.—For the following works:—(1) Asphalte work on roofs, new slaughterhouses, Gorgie, and (2) painter work of new Corn Market, Gorgie. Mr. James A. Williamson, A.R.I.B.A., Public Works Office, City Chambers.

GUILDFORD.—July 17.—For erection of certain walling and a sanitary outbuilding on the workhouse premises. Mr. Edward L. Lunn, architect, 36 High Street, Guildford.

GRANTOWN-ON-SPEY.—July 17.—For the mason, carpenter, plumber, slater, plasterer and painter works of additions and alterations at the Grammar School. Deposit 5*s.* Mr. John Wittet, architect, Elgin.

GRAYRIGG, NEAR KENDAL.—July 23.—For the whole or separate works required in removing gallery, re-seating and flooring, erecting vestry, and other alterations at the St. John's Church. Mr. S. Shaw, architect, Kendal.

HEADINGTON.—July 24.—For erection of additional classrooms and cookery centre at the Headington Council school, Oxfordshire. Deposit 1*l.* 1*s.* The County Surveyor, 8 New Road, Oxford.

HULL.—July 19.—For erection of two blocks of almshouses at the entrance to the Pickering Park, Hessle Road. Deposit 2*l.* 2*s.* Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

ILFORD.—July 19.—For supplying and laying a patent composition floor upon the existing worn wood block flooring to Central Hall at Newbury Park infants' school, Ilford, and for incidental work in connection therewith. Mr. H. Shaw, M.I.C.E., Town Hall, Ilford.

ILFORD.—July 19.—For erection and completion of brick boundary walling, wrought-iron palisading on granite base, and entrance gates to enclose the boys' and girls' school site at the South Park elementary school, Water Lane. Deposit 5*l.* 5*s.* Mr. C. J. Dawson, F.R.I.B.A., 11 Cranbrook Road, Ilford.

IRELAND.—July 19.—For improvements to Gortnessy Manse. Messrs. Robinson & Davidson, architects and engineers, Richmond Street, Londonderry.

IRELAND.—July 22.—For erection and completion of Congregational church at Ballynahinch, co. Down. Mr. John Seeds, architect, 7 Donegall Square West, Belfast.

LEEDS.—July 19.—For the bricklayer and mason, carpenter and joiner, plumber, slater, painter, ironfounder, tiling and hot water heating required in erection of block 3 at the union workhouse, Beckett Street, Leeds. Send names and 2*l.* 2*s.* deposit to Mr. C. F. Bowman, architect, 5 Greek Street, Leeds.

LONDON.—July 19.—For erection of eight cottages in Mill Road, Merton Abbey Estate, High Street, Merton, S.W. Mr. Henry R. G. S. Smallman, A.R.I.B.A., 8 Queen Street, Cheapside, E.C.

LONDON.—July 19.—For the fireproofing of the National Gallery, East Wing. Deposit 1*l.* 1*s.* Mr. H. N. Hawks, I.S.O., H.M. Office of Works, Storey's Gate, S.W.

LONDON.—July 21.—For additional accommodation for male staff at the Eastern Fever Hospital, Homerton Grove, Homerton, N.E. Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief, Metropolitan Asylums Board.

LONDON.—July 26.—For erecting a mortuary keeper's cottage in St. Mary Magdalene Gardens, Holloway Road, N., for the Islington Borough Council. Deposit 2*l.* 2*s.* Mr. J. Patten Barber, borough engineer, Town Hall, Upper Street, N.

LONDON.—July 21.—For repairs to slate roofs and chimney stacks, &c., at the South-Western Fever Hospital, Landor Road, Stockwell, S.W. Deposit 1*l.* Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief, the Metropolitan Asylums Board, Embankment, E.C.

LONDON.—July 22.—For sundry works in providing and laying pitch-pine floor, plastering walls, and sundry decorative works to Ward No. 5 of the infirmary, Marloes Road, Kensington. Mr. W. R. Stephens, clerk, Marloes Road, Kensington, W.

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LYDD (KENT).—July 31.—For erection of an infectious hospital. Send names and 2*l.* 2*s.* deposit by July 21 to Mr. Thurlow Finn, architect, 22 Surrey Street, Strand, W.C.

MACCLESFIELD.—July 19.—For the widening of the Mill Hill Bridge, and for the repair of the Pownall Brow bridge. Mr. Thomas Carswell, district surveyor, 19 King Edward Street, Macclesfield.

MANCHESTER.—July 21.—For erection of two blocks at the Withington workhouse, for the Guardians of Chorlton Union. Deposit 2*l.* 2*s.* Messrs. Charles Clegg & Son, architects, 21 Spring Gardens, Manchester.

MANCHESTER.—July 23.—For erection of a boundary wall and entrance gates at Brookdale Park, Newton Heath. Deposit 1*l.* 1*s.* The City Surveyor's Office, Town Hall, Manchester.

NANTWICH.—July 22.—For taking down and rebuilding of shop, dwelling house and premises, No. 7 Pillory Street. Deposit 1*l.* 1*s.* Mr. C. E. Davenport, architect, Nantwich.

NEWCASTLE-UPON-TYNE.—July 31.—For the internal walls, sanitary fittings, floors, tiling and joiner work for a men's public convenience under the approach roadway to bridge, Milk Market. Deposit 1*l.* 1*s.* The City Engineer's Office, Town Hall, Newcastle-upon-Tyne.

OFFHAM.—July 19.—For the execution of repairs, painting, &c., at the Offham Council school, Kent. Mr. Percy C. Goldsworthy, correspondent, West Malling.

PORTSMOUTH.—July 22.—For constructing and maintaining in thorough repair for six months a ferro-concrete retaining wall at the Fish Market, Portsmouth, together with a wooden bulwark and stairs and other works in connection therewith. The Borough Engineer's Office, Town Hall, Portsmouth.

RADLETT.—July 28.—For erection of detached cottage at Radlett, Herts. Mr. C. Gordon Samson, architect, Oldfield, Bournemouth.

RAWMARSH (YORKS).—July 17.—For the whole or any branch of trade required in the erection of four dwelling houses in one block and two semi-detached houses. Send in names to Mr. J. Platts, architect, High Street, Rotherham.

ROCHDALE.—July 21.—For the supply and laying of about 240 square yards of maple wood-block flooring, for the libraries committee. The Borough Surveyor, Town Hall, Rochdale.

ST. BURYAN.—July 31.—For erection of Council school at St. Buryan, Cornwall. Mr. Sampson Hill, architect to the committee, Green Lane, Redruth.

SALISBURY.—July 17.—For erection of a mortuary in Salt Lane. Mr. W. J. Goodwin, A.M.I.C.E., city engineer and surveyor, Municipal Offices, Salisbury.

SEATON SLUICE.—July 27.—For erection of Wesleyan Methodist Chapel. Deposit 1*l.* 1*s.* Messrs. Joseph Potts & Son, architects and surveyors, 57 John Street, Sunderland.

SHEFFIELD.—July 19.—For the construction of timber dressing shed, &c., at the Rivelin Valley bathing pool. Deposit 10*s.* City Engineer, Town Hall, Sheffield.

SHEFFIELD.—Aug. 10.—For erection of the Training College Hall of Residence for Men, and also for the heating and the electric lighting of same. Messrs. Gibbs & Flockton, architects, 15 St. James Row, Sheffield.

SOUTH WEALD.—July 19.—For the construction of a brick and timber bridge (16 feet wide and 11 feet span), in Vicarage Lane, South Weald, Essex. Mr. F. E. Ennals, surveyor, Shelley Road, Hutton.

STOCKPORT.—July 27.—For the manual and team labour and materials required in the erection of the brick walls and the laying of the concrete floor, &c., of a filter, at the sewage disposal works. Mr. John Atkinson, A.M.I.C.E., borough surveyor, Town Hall, Stockport.

STOCKPORT.—July 20.—For the conversion of houses into shop premises, also the several alterations and repairs to houses 70 to 78 Oxford Street, for the Stockport Industrial and Equitable Co-operative Society, Ltd. Deposit 1*l.* 1*s.* Messrs. Wrathmell & Blackshaw, architects, Queen's Buildings, St. Peter's Square, Stockport.

STOKEFLEMING (DARTMOUTH).—July 19.—For repairs to the Stokefleming Council school. Mr. Arthur M. Dawson, correspondent, Hanover Square, Dartmouth.

TORPOINT.—July 31.—For erecting Council schools. Mr. B. C. Andrew, architect to the Cornwall education committee, Biddick's Court, St. Austell.

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THORNHILL.—July 20.—For the pointing, &c., of the chimney stack at the sewage works, Mill Bank, Thornhill, Yorks. Mr. A. Rothera, engineer and surveyor to the Council, Council Offices, Thornhill.

WALES.—July 17.—For erection of sixteen houses at Senghenydd, for the Senghenydd (No. 1) Building Club. Mr. Arthur Lloyd Thomas, A.M.I.M.E., architect and surveyor, Church Street Chambers, Pontypridd.

WALES.—July 17.—For erection of a building and the construction of a swimming-bath for the Y.M.C.A. at Ammanford. Deposit 2*l.* 2*s.* Send names to Mr. David Thomas, M.I.Mun.E., architect and surveyor, Quay Street, Ammanford.

WALES.—July 19.—For carrying out the following works for the Mountain Ash education committee:—(1) Building retaining walls, &c., re-forming, ballasting and gravelling Caegarw girls' and infants' schools' playgrounds; (2) building chimney breast, stack, &c., providing and fixing glazed partition and other minor alterations at Ynysboeth mixed school. External painting of (3) Trerobart boys' school; (4) Navigation boys', girls', relief and infants' schools; (5) Penrhiwceiber boys', girls' and infants' schools; (6) Caegarw boys' school; (7) Miskin mixed and infants' schools; (8) Cefnpennar infants' school. The Architect's Office, Town Hall, Mountain Ash.

WALES.—July 19.—For the following works, for the Glamorgan County Council, viz.:—(1) Alterations to the Skewen Lower Council school, near Neath; (2) alterations to the Neath Abbey Council school, near Neath; (3) alterations and additions to the Aberdare County school; (4) erection of caretaker's cottage at Mountain Ash County school; (5) alterations to Penrhiwfer Council school; (6) minor alterations at Port Talbot County school. The Glamorgan County Council Offices, Westgate Street, Cardiff.

WALES.—July 20.—For the construction of roads and sewers, also for eight villas and twenty-two or more cottages at Treharris. Mr. William Dowdeswell, architect, Treharris.

WALES.—July 20.—For making alterations and additions to vestry, Bethel Welsh Calvinistic Methodist chapel, Ystrad Rhondda. Deposit 2*l.* 2*s.* Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre.

WALES.—July 22.—For rebuilding Moriah Calvinistic Methodist chapel, Llanstephan. The Chapel House, Llanstephan.

WALES.—July 22.—For erection, completion, and maintenance for six months of a schoolmaster's residence in connection with the Minera new Council schools, Wrexham. Mr. Walter D. Wiles, county architect and surveyor, 42A High Street, Wrexham.

WALES.—July 24.—For alterations to disinfecting chamber, ambulance shed, dining-room and larder, at the Joint Fever Hospital. Mr. J. Price Evans, engineer, Argyle Chambers, Wrexham.

WALES.—July 26.—For erection of thirty houses at Wattstown, Rhondda Fach, for the Wattstown No. 1 Building Club. Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd.

WALES.—July 26.—For erection of a higher standard mixed school, to accommodate 160 scholars, with laboratory, manual instruction centre, offices, and boundary walls, at Miskin, Mountain Ash. Deposit 1*l.* 1*s.* Mr. W. H. Williams, architect, Town Hall, Mountain Ash.

WALSALL.—July 23.—For executing various alterations, additions and renovations to the music-hall, Bloxwich, for the Corporation. The Borough Surveyor, Council House, Walsall.

WHITEHAVEN.—July 17.—For alterations and additions to No. 1A Victoria Road. Messrs. J. S. Moffat & Bentley, architects, 53 Church Street, Whitehaven.

WINCHESTER.—July 19.—For the extension of Post Office. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

WITHINGTON.—July 21.—For the erection of two new blocks at the workhouse, Chorlton Union. Deposit 2*l.* 2*s.* Messrs. Charles Clegg & Son, architects, 21 Spring Gardens, Manchester.

PLANS for a church at Westcliff to accommodate over 900 people, and which is estimated to cost 10,000*l.* or 11,000*l.*, have been prepared and adopted by a meeting of members of St. Saviour's. It is proposed to erect the nave and transepts first, then to proceed with the chancel, and finally to build the tower.

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Bowchin	890 0 0
Minams	879 0 0
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Martin	715 0 0
Goodburn	701 0 0
Denne & Sons	696 0 0
May	693 15 0
Holbourn	678 0 0
BROWN, Broadstairs (*accepted*)	635 0 0

DARWEN.

For alterations at Culvert school. Messrs. SAMES & GREEN, architects, Darwen.

R. & W. Knowles	£611 0 0
Knowles	594 0 0
Edmundson & Son	593 0 0
Livesey & Son	588 10 0
Westwell	560 14 10
LIGHTBOWN, Darwen (*accepted*)	552 0 0
Marsh & Fretwell	549 0 0

ENFIELD.

For preparation of site and construction of foundations, &c., for a pumping-station in Hadley Road, for the Metropolitan Water Board.

Coles	£4,765 0 0
Mattock & Parsons	3,873 0 0
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Rigby	2,476 0 0
Nowell	2,423 0 0
Nightingale	2,337 0 0
Paterson	2,292 0 0
HAWKINS & Co., 109 Victoria Street, S.W. (*accepted*)	2,184 0 0

HECKINGTON.

For erection of farm building at Heckington, for the Kesteven County Council. Mr. JESSE CLARE, county architect, Sleaford.

Banks & Son	£313 0 0
Sharpe & Son	312 1 6
Newton	306 10 0
Bland	305 3 6
Tapster	289 10 0
Curt	288 0 0
Benstead & Son	279 1 10
WALLHEAD BROS., Ruskington (*accepted*)	272 10 0

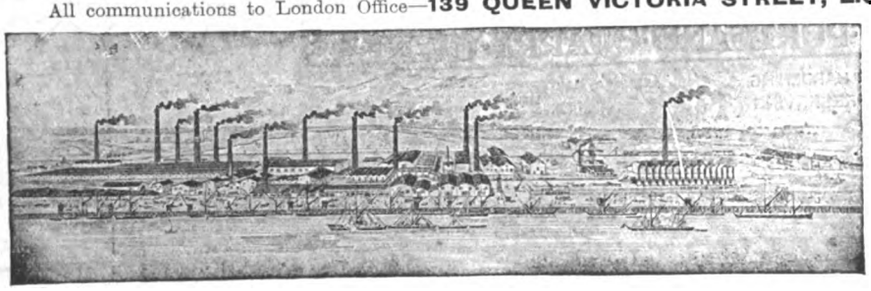
HEPTONSTALL (YORKS).

For cleaning, maintaining and decorating the parish church. Messrs. SUTCLIFFE & SUTCLIFFE, F.S.I., architects, Hebden Bridge.

Watson & Watson	£363 0 0
Harland & Sons	245 0 0
Holdsworth	239 8 0
Simpson & Sons	192 0 0
WRIGLEY & SONS, Hebden Bridge (*accepted*)	148 0 0

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Cutler & Sons	480 9 0
Wills	470 13 6
Hidden	400 0 0
Jarman & Co.	397 0 0
WRIGHT, 150 Brixton Hill, S.W. (*accepted*)	293 10 0
Richards	249 8 0

LIVERPOOL.

For erection of the Franciscan Church and Friary, Fox Street and Bute Street, Liverpool. Messrs. PUGIN & PUGIN, architects, Liverpool.

Foster & Dicksee	£15,551 0 0
Stephens, Bastow & Co.	14,975 0 0
Wilkins & Sons	14,890 0 0
Dilworth	14,425 0 0
Jones & Sons	14,230 0 0
Thornton & Sons	13,520 0 0
Henshaw & Sons	13,352 10 0
Travis & Wevill	13,280 0 0

LONDON.

For the making-up and paving of part of Southcroft Road, Streatham, for the Wandsworth Borough Council. Mr. P. DODD, borough engineer.

Wood & Sons	£1,257 9 1
Adams	1,133 0 0
Harringdon & Co.	1,100 0 0
Lane & Co.	1,070 4 9
Mowlem & Co.	1,070 0 0
Dykes	1,070 0 0
Parry & Co.	1,065 0 0
Harber & Co.	1,035 0 0
E. & E. Iles (*recommended*)	971 0 0
Borough engineer's estimate	1,084 4 4

LONDON—*continued.*

For construction of two underground conveniences in Horseferry Branch Road by Commercial Road East, for the Stepney Borough Council.

Jennings	1,960 0 0
Thomas & Edge	1,621 0 0
Symes	1,553 0 0
Barker	1,539 0 0
Harris & Wardrop	1,526 0 0
Roome & Co.	1,523 0 0
Spencer, Santo & Co.	1,508 0 0
F. & G. Foster	1,476 0 0
F. & T. Thorne	1,463 0 0
Nightingale (*recommended*)	1,410 0 0

For the work of enlarging the conveniences at London Fields, for the L.C.C.

Marchant & Hirst	£285 0 0
Parrott & Isom	253 0 0
Vigor & Co.	226 15 0
Griggs & Son	219 0 0
Bull	217 0 0
Newell & Lusty (*recommended*)	214 0 0
Estimate	210 0 0

For the erection of 110 cottages on the third part of section B of the Norbury estate, comprising thirty cottages with three rooms, fifty-four with three rooms and a boxroom, twenty-five with four rooms and one with five rooms. Each cottage will in addition contain a scullery and the usual offices, for the L.C.C.

F. & H. F. Higgs	£27,013 0 0
Smith & Sons	25,000 0 0
Akers & Co.	23,806 0 0
Saunders	23,670 0 0
Carter	22,399 0 0
Wall	21,857 0 0
Gathercole Bros.	21,251 0 0
Rowley Bros.	21,141 0 0
F. & T. Thorne, Isle of Dogs (*recommended*)	20,787 0 0
Architect's estimate	21,181 0 0



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LONDON—*continued.*

For erection of St. Mary's Hospital, Plaistow, E. Mr. ALFRED SAXON SNELL, architect, 22 Southampton Buildings, Chancery Lane, W.C.

Sheffield Bros.	£17,451 0 0
Turtle & Appleton	16,335 0 0
Harris & Wardrop	15,992 0 0
Thomas & Edge	15,946 0 0
Symes	15,928 0 0
Mattocks & Parsons	15,847 0 0
Brown Bros.	15,812 12 10
Higgs & Hill	15,794 0 0
Jerram	15,700 0 0
Kirk & Randall	15,320 0 0
Luton	15,287 0 0
Maddison	14,919 0 0
Kent	14,912 0 0
Moss	14,862 5 6
Nightingale	14,798 0 0
Fryer	14,471 0 0
Minter	14,433 0 0
Allen & Sons	14,420 0 0
Spencer, Santo Co.	14,390 0 0
F. & E. DAVEY (*accepted*)	14,337 1 11

For the construction of a home on the asylum estate to accommodate thirty-eight nurses, for the City of London Asylum visiting committee.

Lidstone	£8,679 0 0
Mowlem & Co.	8,325 0 0
Ashby Bros.	7,769 0 0
Kilby & Gayford	7,748 0 0
Knight & Co.	7,547 0 0
Greenwood	7,417 0 0
Johnson & Co.	7,399 0 0
Holloway Bros.	7,300 0 0
Jarvis & Sons	7,180 0 0
Lonsdale	7,076 0 0
Moss & Sons	7,061 0 0
SHEFFIELD BROS.*	6,195 0 0

* Accepted with alterations reducing the amount to 5,750*l.*

LONDON—*continued.*

For the erection of a manual training centre for forty boys on the Roman Road site, Bow and Bromley, for the L.C.C.

Marchant & Hirst	£1,796 0 0
Brand, Pettit & Co.	1,584 0 0
Willmott & Sons	1,556 0 0
Symes	1,414 0 0
Roberts & Co.	1,357 0 0
Chessum & Sons	1,353 8 9
Stevens & Sons	1,315 0 0
J. & C. Bowyer, Upper Norwood (*recommended*)	1,296 0 0
Architect's (Education) estimate	1,360 0 0

For the erection of additional conveniences for men at Springfield Park.

Lowe & Co.	£252 0 0
Marchant & Hirst	217 0 0
J. & C. Bowyer	204 0 0
Grover & Son	194 0 0
Barker & Co. (*recommended*)	178 10 0
Estimate	190 0 0

For cleaning and painting work at certain London County Council schools.

Tenders recommended for acceptance.

Portman Place, Bethnal Green.

Willmott	£645 0 0

Malmesbury Road, Bow and Bromley.

Horswill	583 0 0

Napier Street, Hoxton.

Markham & Markham	651 0 0

Duncombe Road, Islington.

Stewart	565 5 0

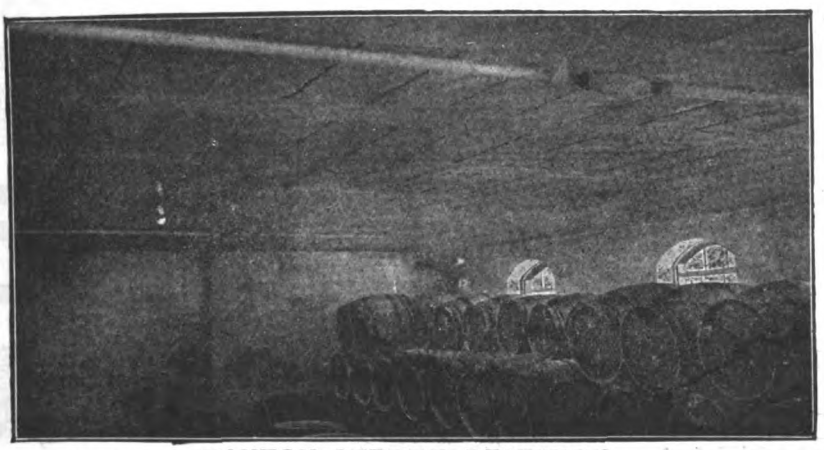
Burghley Road and the County Secondary School, Kentish Town, St. Pancras.

Stevens & Sons	568 0 0

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NO. 13, PROFESSOR BERESFORD PITE, F.R.I.B.A.

PELHAM SCHOOL, WIMBLEDON.—NORTH-EAST VIEW FROM SOUTHEY ROAD—AN ENTRANCE DOORWAY—AN ENTRANCE GATEWAY.

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LONDON—*continued.*

Tenders accepted by the Education Committee.

Neckinger Road, Bermondsey.

Fenn	359 0 0

Page's Walk, Bermondsey.

Musgrove	256 19 0

Hackford Road, Brixton.

Garrett & Son	380 0 0

Camberwell School of Arts and Crafts, Camberwell.

Glendinning	425 0 0

Leipsic Road, Camberwell.

Garrett & Son	361 0 0

Bonneville Road, Clapham.

Glendinning	375 0 0

Honeywell Road, Clapham.

Johnson & Co.	420 0 0

Ponton Road (day industrial and infants), Clapham.

Lathey Bros.	378 0 0

Tennyson Street, Clapham.

Garrett & Son	242 0 0

The Denmark Hill, Dulwich.

Line	375 0 0

The Dulwich Hamlet, Dulwich.

Holliday & Greenwood	353 0 0

Greenwich Higher Elementary, Greenwich.

Mills	295 0 0

Fleet Road, Hampstead.

H. & E. Lea	370 0 0

LONDON—*continued.*

Curtain Road, Hoxton.

Haydon & Sons	315 15 0

Plassy Road, Lewisham.

Proctor & Sons	370 0 0

Stillness Road, Lewisham.

Proctor & Sons	360 0 0

Sydenham Hill Road, Lewisham.

Fenn	473 18 0

Woodland Road, Norwood.

Young	223 0 0

Woods Road, Peckham.

Parker & Sons	477 0 0

Great College Street, St. Pancras.

Stevens & Sons	328 0 0

Stanhope Street, St. Pancras.

Roberts & Co.	442 0 0

Dempsey Street, Stepney.

Newell & Lusty	471 0 0

Myrdle Street, Stepney.

Woollaston & Co.	454 18 0

Trafalgar Square, Stepney.

F. & E. Davey	496 0 0

The Michael Faraday, Walworth.

Sims	279 0 0

The Southfield, Wandsworth.

Ronald	465 0 0

Swaffield Road, Wandsworth.

Johnson & Co.	394 0 0

Elizabeth Street, Woolwich.

Thomas & Edge	219 0 0

Purrett Road, Woolwich.

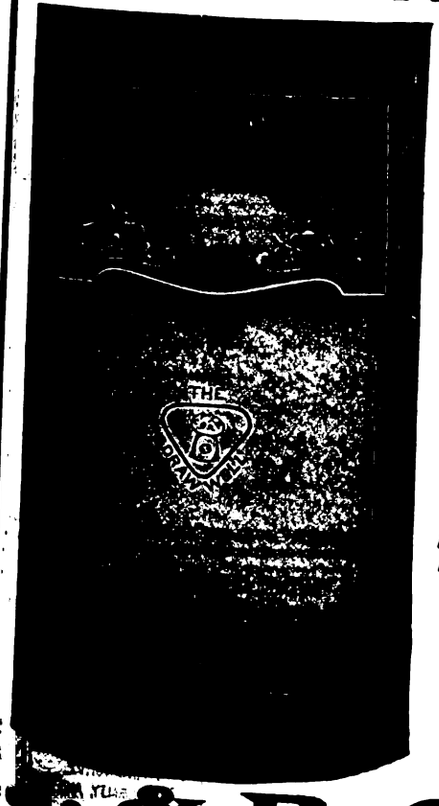
Proctor & Sons	260 0 0

MERTON.

For making up Claremont Avenue, Richmond Avenue, and Station Road. Mr. G. JERRAM, surveyor, Merton.

Mowlem & Co.	£1,940 13 10
Free & Sons	1,842 10 0
Blaker	1,841 19 0
Dykes	1,667 0 0
Adams	1,621 0 0
E. & E. ILES, Wimbledon (*accepted*)	1,530 0 0

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MAIDSTONE.

For two classrooms at the Boys' Grammar School, Tonbridge Road. Mr. T. F. BUNTING, borough surveyor, Maidstone.

Martin & Newman	£955	0	0
Cobden & Co.	893	0	0
Ansett & Son	873	0	0
Smith & Son	871	8	0
Cruttenden	866	0	0
Cox Bros.	849	0	0
Burrows	848	0	0
Barden & Head	840	0	0
Pearce & Sons	830	0	0
Clarke & Epps	829	0	0
Wallis & Sons	827	0	0
Gray & Barney	808	0	0
ELMORE & SON, Maidstone (*accepted*)	790	0	0
Sellick & Son	750	0	0

READING.

For making-up Elgar Road, for the Urban Sanitary Authority. Mr. JOHN BOWEN, A.M.I.C.E., borough engineer and surveyor.

Gibbons	£1,845	0	0
Wilcox	1,844	0	0
Free & Sons	1,777	14	9
McFitt	1,666	0	0
TALBOT, Reading (*accepted*)	1,635	0	0

REDHILL.

For erecting an elementary school at St. John's, for Reigate education committee. Messrs. T. R. & V. HOOPER, architects, Redhill.

Dodd & Co.	£9,700	0	0
McCormish & Sons	7,618	0	0
Higgs	7,600	0	0
Peskett & Co.	7,390	0	0
Denne & Son	7,350	0	0
Hawkins & Co.	7,186	0	0
Pink	7,168	0	0
Lowe & Co.	7,166	0	0
Hale & Co.	7,107	0	0
Drowley & Co.	7,053	0	0

REDHILL—*continued.*

Fitt	6,989	0	0
Cook & Sons	6,980	0	0
Cæsar Bros.	6,978	0	0
Worssell	6,936	0	0
F. & G. Foster	6,927	0	0
Moss & Co.	6,900	0	0
Spencer, Santo & Co.	6,850	0	0
Peerless, Dennis & Co.	6,827	0	0
Wallis	6,800	0	0
Davison	6,723	0	0
Martin	6,690	0	0
CROSBY & Co., Farnham (*accepted*)	6,620	0	0
R. & E. Evans	6,534	0	0

STOCKPORT.

For the work required in erection of infants' school in Lewis Road, North Reddish. Messrs. CHEERS & SMITH, architects, Blackburn and London.

BRIGGS, Stockport (*accepted*)	£4,122	0	0

SKEGNESS (LINCS.).

For erection of house, Drummond Road. Mr. W. BRANDRETH SAVIDGE, A.R.I.B.A., architect, Nottingham.

Fletcher & Son	£829	0	0
CRAWSHAW, Skegness (*accepted*)	790	0	0

SOUTHAMPTON.

For the erection of a police-station and coroner's court at Payne's Road, Freemantle.

BACK, jun., Shirley (*accepted*)	£1,118	0	0

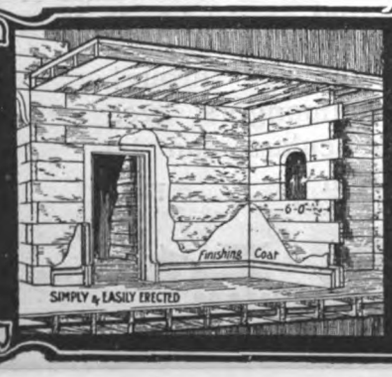
WALES.

For erecting fifteen houses, for the Pengam Building Club, Cardiff. Mr. H. GABE JONES, architect, Hengoed.

Evans	£208	16	0
Burns	174	10	0
D. & T. Jones	170	0	0
Davies	170	0	0
Forsyth	168	0	0
VODDEN & LEE, Pengam (*accepted*)	160	0	0
Costlett	157	0	0

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WALES—*continued.*

For works to be executed in the following streets within the district, for the Connah's Quay Urban District Council, namely: Cable Street, Cestrian Street, Chapel Street, Golftyn Street, Pen-y-llan Street, Union Street, Waterloo Street and Wesley Street. Mr. W. E. HUGHES, surveyor.

Prince	£2,346 3 7
Hughes & Rowland	1,831 11 5
Harris	1,689 0 0
Cowburn & Sons	1,676 0 6
Meikle	1,651 1 7
FLATHER, Ellesmere Park (*accepted*)	1,642 18 10
North Wales Asphalte Co.	1,617 0 9

For the re-erection of tower at the public baths for the Penarth Urban District Council. Mr. H. SNELL, architect, Penarth.

Jones	£376 0 0
Bowers	342 0 0
HOOPER, Penarth (*accepted*)	340 14 6

For alterations to Wern Congregational Chapel and erection of new schoolrooms, &c. Messrs. EVANS & JONES, architects, Station Road, Port Talbot.

Rees	£1,950 0 0
Davies & Son	1,775 0 0
Price Bros.	1,742 10 0
Nicholas	1,719 0 0
Foley	1,634 0 0
Evans	1,610 0 0
Williams	1,590 0 0
Anderson & Vaughan	1,580 12 10
DAVIES, Aberavon (*accepted*)	1,533 9 5

WIGAN.

For cleaning, painting, &c., at the Sanatorium, Whelley.

Beel	£210 0 0
W. & E. Wignall	186 0 0
Gaskell & Son	177 0 0
HEATON, Wigan (*accepted*)	120 0 0

WHITEHAVEN.

For the erection of a new school. Messrs. OLIVER & DODGSHUN, architects, Carlisle.

Accepted tenders.

Moorhouse, Whitehaven, builder	£4,767 11 0
Burrow, Workington, slater	395 0 0
The Northern Asphalte and Roofing Works Co., Leeds, tar paving	277 10 0
Reed & Sons, Carlisle, carpenter and joiner	2,706 13 0
Strathern, Whitehaven, plumber	784 10 0
Ormerod & Son, Carlisle, plasterer	897 19 2
Ormerod & Son, Carlisle, reinforced concrete	255 2 5
Strathern, glazing	94 1 6
M'Conn, Whitehaven, painter	142 17 5

WORCESTER.

For the erection of a secondary day school.

WOOD & SONS, Worcester (*accepted*)	£6,437 0 0

WEMBLEY.

For additions to public offices and fire station. Mr. CECIL R. W. CHAPMAN, surveyor, Wembley.

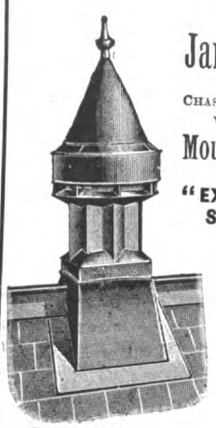
Cakebread & Co.	£1,352 1 5
Minter	1,148 0 0
Tribe & Co.	990 0 0
Allen & Sons	975 0 0
J. & W. Pink	975 0 0
Parfitt & Co.	966 0 0
F. & G. Foster	960 0 0
Bachelor	950 0 0
Evans & Sons	947 0 0
Barker & Co.	944 0 0
Smith	941 4 4
Nightingale	937 0 0
Stone	927 2 5
Spencer, Santo & Co.	905 0 0
W. Gibson & Co.	894 0 0
G. H. Gibson & Son	886 0 0
W. & D. Wilkins	865 0 0
HAYNES, Alperton (*accepted*)	859 13 8

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WRENBURY, NEAR NANTWICH.

For interior alterations at the Wrenbury Church, near Nantwich, comprising wood-block flooring to nave and aisles, reseating to ditto, heating, ventilation, &c. Mr. C. RUSSELL HALL, architect, Congleton.

Bridgeman & Sons	£876 10 9
Greenhalgh & Co.	843 0 0
Kimberley	828 0 0
Manley	823 7 3
Bennett Bros.	750 0 0
E. & A. Frith	746 19 0
Smith	737 10 0
Cox & Vaughan	686 0 0
MATTHEWS, Nantwich (*accepted*)	649 10 0

Heating.

Wells	227 0 0
Kimberley	191 0 0
Bridgeman & Sons	179 15 1
Smith & Co.	178 1 6
Alger & Sons	171 16 2
Lowe & Sons	152 17 0
MARLOW & SON, Macclesfield (*accepted*)	152 19 8

Received too late for Classification.

STOKE-ON-TRENT.

For the erection of a skating-rink, for the Stoke-on-Trent Rink Syndicate. Mr. J. BEARDMORE, architect, Stoke-on-Trent.

Cross & Cross	£3.849 0 0
Ball & Robinson	3,350 0 0
Ginger, Lee & Co.	3,100 0 0
Parkin	2,500 0 0
Walsh-Graham	2,400 0 0
Hopkins	2,280 0 0
Yoxall	2,200 0 0
THE PORTABLE BUILDING CO., Manchester *	1,908 10 0
Harrington	1,760 0 0

* Accepted, with Mr. T. R. Yoxall, of Stoke, as sub-contractor for brickwork, &c.

CARDIFF.

For the erection of a proposed new warehouse, Severn Road, Canton, Cardiff, for Messrs. George Wensley & Sons, removal contractors. Mr. IVOR JONES, A.R.I.B.A., architect, Cardiff.

James	£712 0 0
Evans & Bros.	639 0 0
Griffiths & Son	622 10 0
Symonds & Son	598 0 0
Davies & Howell	596 0 0
WATERMAN (*accepted*)	594 0 0

GUILDFORD.

For the erection of the Receiving Home for Children. Mr. E. L. LUNN, architect.

Higlett & Hammond	£3,300 0 0
Mitchell Bros.	3,270 0 0
Tribe & Robinson	3,260 0 0
Ellis	3,133 0 0
Adams	2,937 0 0
DROWLEY & Co., Woking (*accepted*)	2,765 0 0

THE Surrey education committee have approved the report of the building sub-committee, which stated that the tender of Messrs. Martin, Wells & Co., of Aldershot, amounting to 2,070*l.*, had been accepted for the erection of the Chobham infants' school. The tender of Messrs. W. H. Gaze & Sons, amounting to 823*l.*, had been accepted for improvements to the Claygate C. School; plans for alterations to the Walton-on-Thames boys' and girls' school, involving an estimated cost of 1,700*l.*, had been approved, as well as plans for alterations at the Walton infants' C. school, at a cost of 575*l.*, and for improvements to Yorktown C. schools, representing a cost of 800*l.* The tender of Messrs. Mitchell Bros., for 2,102*l.*, for carrying out the necessary alterations and improvements to the Godalming infants' C. school, had been accepted, as well as that of Mr. F. Potter, for 1,770*l.*, for similar work at Thames Ditton C. school.

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BEFORE deciding where to spend your holidays send a postcard to Publicity Department, 216 Marylebone Road, N.W., for A.B.C. excursion programme just issued by the Great Central Railway Company. It will give you valuable information in a concise form.

MESSRS. BRISTOWE & Co., of Broad Sanctuary Chambers, Tothill Street, Westminster, proprietors of the well-known material for dust prevention on roads and known as Tarvia, and the proprietors of the Parker safety pipe joint and the series of sanitary fittings known as the H.H., have registered their business as a private limited liability company.

MESSRS. MOULE'S Patent Earth Closet Co., Ltd., notify that after June 24 the offices and show-rooms are removed to their new and spacious premises, Doughty House, 2 Guilford Street, Russell Square, W.C. (Gray's Inn Road end), and as the new offices adjoin the company's workshops they afford increased facilities for rapid execution of orders.

WE understand that Messrs. F. G. Edey & Co., electrical engineers and contractors, of 29 Ludgate Hill, are removing on July 16 to larger and more convenient premises at 25 Warwick Lane, E.C. They have been established at Ludgate Hill for the past sixteen years, during which time they have carried out a large amount of important installation work in London and suburbs. In 1904 they introduced a maintenance department, which under careful supervision has met with the same measure of success as the other branches of their business.

IN our descriptive article on the Victoria and Albert Museum at the time of its opening by the King at the end of June we remarked that Sir Aston Webb kept the interior of the galleries remarkably simple in treatment. This statement was fully borne out by the photographs reproduced in the issues for July 2 and 9. That such apparent severity does not produce the effect of parsimony is owing to the able use of plain but high quality materials, and among these we must include the glazed brickwork, all of which was supplied by Messrs. Rufford & Co., of Stourbridge and London, through Messrs. Holliday & Greenwood, the general contractors. This firm make glazed bricks of every description, as well as baths, sinks, firebricks, &c.

AMONG the new companies that have just been registered are Bristowe & Co., Ltd., July 9 (27,000*l.*, in 1*l.* shares), Broad Sanctuary Chambers, Westminster, S.W.; and Lewes Portland Cement and Lime Company, Ltd., July 9 (30,000*l.*, in 1*l.* shares—15,000*l.* 5 per cent. preference), 24 Malling Street, Lewes.

IN our notice last week respecting the new heating and ventilating apparatus at the Natural History Museum it is suggested that the apparatus has been installed. But we are informed by the Brightside Foundry and Engineering Company that this is not the case. The work was started last year, and one-half of the apparatus was then completed, and the second and final portion is now being installed by them, under the supervision of the chief engineer of the Office of Works. The system adopted is quite unique and is a combination of heating by steam and hot-water radiators. The hot-water radiators are served by calorifiers (specially designed and made by the company at their Sheffield works), and fresh warm air is forced through the radiators into the rooms by means of fans. The galleries and other parts of the Museum are warmed and ventilated by a series of steam-heated radiators enclosed in galvanised-steel cabinets through which the fresh air is forced.

A PARTY of about ninety of the employés of Messrs. Heathman & Co., Parson's Green, S.W., with their friends, made a pleasant trip on Saturday last from Kingston-on-Thames by steam launch to Windsor, where the trippers made the most of the hour allowed on shore, some being sufficiently adventurous to climb the Castle tower, for which feat they were amply rewarded by the magnificent view. An excellent lunch and tea were served on board, the caterers being Messrs. Morris & Sons, of Richmond. Mr. and Mrs. Heathman with several others contributed to the musical programme, the accompaniments for which were played by Mr. Harold Hocking. As the launch neared Kingston on the homeward journey, Mr. Mitchell, the fore-

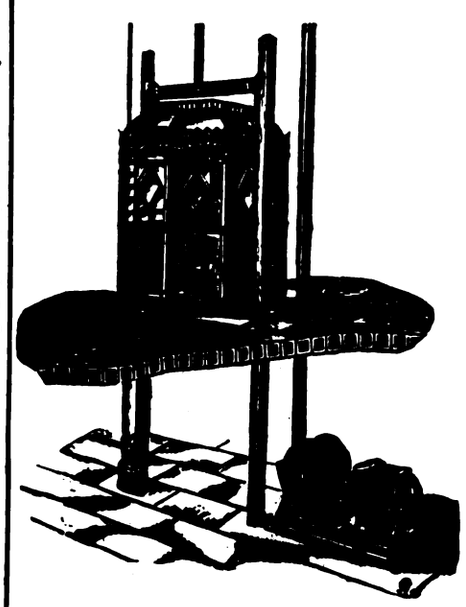
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man of the works, proposed a vote of thanks to Mr. and Mrs. Heathman for their kindness and the trouble they had taken in providing such a capital day's enjoyment for all present. Mr. Heathman suitably replied, and after several other speeches the proceedings were brought to a close by the singing of "Auld Lang Syne" and "God Save the King" just as the party reached the landing-stage at Kingston, where all disembarked and wended their way home.

VARIETIES.

MR. T. K. RODDAM, C.E., A.M.I.C.E., has been selected, out of 107 applicants, for the post of burgh surveyor at Broughty Ferry, N.B., at a salary of 180*l.* a year.

ONE of the estimates of expenditure of the Orange River Colony in 1909-10 is 42,000*l.* for the re-erection of Government buildings destroyed by fire.

THE Kilmarnock master masons have agreed that the rate of wages should be reduced ½*d.* per hour for masons and bricklayers. This makes the standard rate for masons 8*d.* per hour and for bricklayers 8½*d.* per hour.

THE Derbyshire County Council have agreed to purchase a site of 4,494 square yards for the provision of additional County offices at Derby. The plot is opposite the existing offices, and will cost about 8,000*l.*

THE Rochdale Board of Guardians, who require the services of an electrical engineer for the plant at the workhouse, have received no fewer than 582 applications from all parts of the country. The salary offered is 50*s.* a week, with a house.

THE Local Government Board having written the Castleford Urban District Council as to the state of their Redhill reservoir, the Council have instructed Messrs. D. Balfour & Son, of London and Newcastle-on-Tyne, to inspect and test the reservoir as to its leakage, and report fully as to its being made watertight.

THE Board of Trade has intervened successfully in the dispute between the Manchester stonemasons and their employers. Both the master masons and the operatives have agreed to submit the matter in dispute to an arbitrator, who will be appointed by the Board. Pending the award of the arbitrator the operatives will at once resume work on the conditions that existed before the dispute began.

MR. JOHN B. THORP, who designed and built the representations of "Old London" last year at the White City, has made arrangements with the Golden West Exhibition committee to exhibit the work at Earl's Court. "Old London" will be found in the "Midway," and is proving a great attraction.

THE electrical engineer of the Newport Corporation is negotiating with a large firm for the supply of electrical energy in bulk. If the customer is secured, a large extension of the Corporation's plant, involving an expenditure of 70,000*l.*, would have to be made.

THE Rotherham Rural Council on Monday considered the report of Mr. J. J. Taylor, of Westminster, who had been consulted with respect to the projected schemes of water for the eastern portion of the district. The preliminary estimate is upwards of 20,000*l.* The matter was referred to a special meeting of the water committee.

THE Walsall Town Council on Monday adopted a recommendation that certain extensions and alterations at the electricity works be proceeded with at an estimated cost of 35,000*l.* A similar proposal was before the Town Council some time ago, and was then passed by a majority of one, but subsequently the whole question was referred to a joint committee.

THE housing committee of the Swansea Corporation at their last meeting approved of the principle of giving preferential terms to builders taking land for the erection of workmen's dwellings. The Corporation are having 160 houses built, and as showing the lack of housing accommodation in the town for workers, it was stated that there were four times as many applicants as the houses that are being built.

AT the last meeting of the Liverpool City Council, a proposal of the finance committee to obtain powers to make a grant of 5,000*l.* towards the erection of the building for an out-patients' department in connection with the Royal Infirmary was discussed. Some of the speakers objected to the municipality contributing out of the rates to the support of hospitals, but the Council, by forty-two votes to thirty-four, agreed with the finance committee's recommendation.

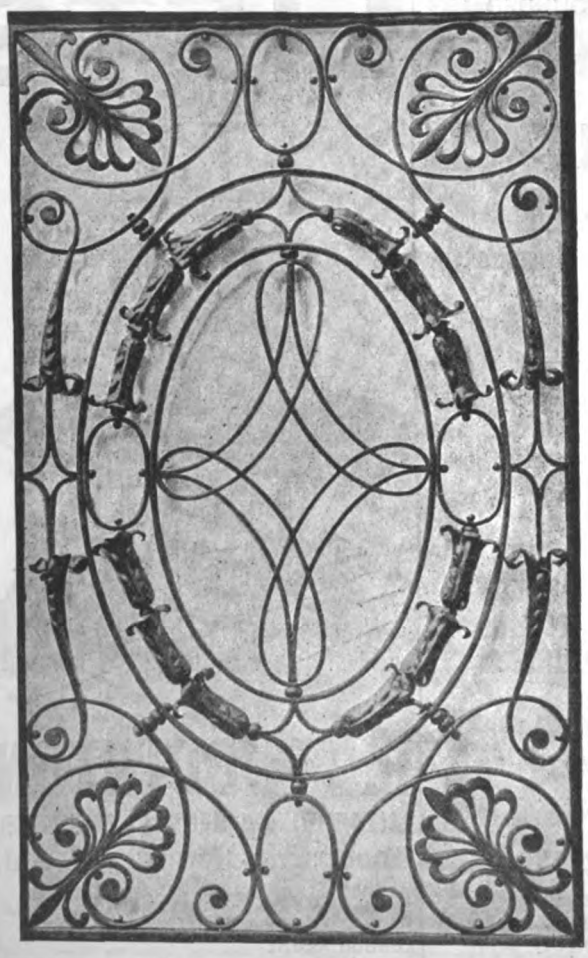


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MR. JOHN HENRY GUNTER, of Middlesbrough, has been appointed to undertake the inspection of the whole of the steelwork for the transporter bridge across the Tees at Middlesbrough, at a fee of 220*l.*, the Middlesbrough Corporation to provide him with a third-class railway pass between Middlesbrough and Glasgow, where the steel is to be made. Mr. Hunter Scorer has been appointed inspector in connection with the bridge works, at a salary of 3*l.* 10*s.* per week.

A SCHEME for providing further educational facilities in Croydon, the total cost of which is estimated at 28,000*l.*, has been adopted by the Town Council, but it is not proposed that the whole of the work shall be taken in hand at once. It includes a boys' secondary school (16,000*l.*), enlargement of the Polytechnic to adapt it for a boys' higher elementary school (5,000*l.*), and a new elementary school (7,000*l.*).

AT the last meeting of Heath Town District Council, Wolverhampton, plans were submitted for the erection of a further number of houses at the Garden Suburb, Fallings Park. They did not show any drainage, and objection was raised to them on the ground that the owners of the land ought to construct a sewer along the street to connect the drainage with the public sewerage. The plans were referred back for consideration.

MESSRS. FRANK MATCHAM & Co., architects, 9 Warwick Court, Holborn, W.C., have prepared plans for the reconstruction of the Theatre Royal, Croydon, as an up-to-date theatre of varieties, which plans have been approved by the local authorities and by the ground landlord. The proposed building as reconstructed will have two tiers, will be capable of holding about 2,000 persons, and is designed on fireproof principles. The cost of the proposed alterations, including complete decoration and furnishing, is estimated at 15,000*l.*

AT the Southampton County Court, before Judge Guy, four building firms sued an architect who had advertised for tenders, and asked all the builders who tendered to deposit 1*l.* 1*s.* for the quantities. Plaintiffs deposited the guineas, but did not receive any quantities, and now sued for the return of the money. Judgment was given for the plaintiff in each case, to be paid in fourteen days. Mr. H. G. R. Aldridge appeared for plaintiffs.

THE Bradford baths committee have drawn up a revised scheme for the erection of district baths at Wyke, and it will be submitted to the City Council for confirmation in due course. The proposed new baths will be on the same lines as the other district baths in the city, but will not be quite so elaborate or so expensive. The estimated cost is 5,700*l.*, compared with 6,500*l.* and upwards of the other district baths.

WOOD GREEN District Council has decided to apply for sanction to borrow 31,150*l.* for the purpose of obtaining a bulk supply of electricity and to distribute it to consumers. Five years ago the Council asked the Local Government Board for a loan of 45,000*l.* to generate and supply electric light, but the Board refused the application. The Council now propose to obtain the current from the North Metropolitan Electric Supply Company. The supply undertaking will cost 27,000*l.*, house-wiring 2,500*l.*, and public lamps 1,750*l.*

THE Aberdeen Town Council had before them last week a recommendation by the water committee to make application for a provisional order in the session 1910 for authority to take a supply of water for the city from the river Avon, the estimated cost of the scheme being placed at 1,512,000*l.* for a supply of 20,000,000 gallons per day. As a section of the Council had previously expressed the opinion that the present was an inopportune time for proceeding with such a costly undertaking—in view of recent serious increases in the school and parish rates—it was agreed, on the motion of the Lord Provost, to defer consideration of the report till August 4.

THE Alnwick Urban District Council have adopted the report of Mr. J. C. Mellis, C.E., on the Alnwick sewage disposal competition. Mr. Mellis said he had gone over the twelve schemes submitted by eight competitors, and he recommended that the premium of 30*l.* be paid to Messrs. Spinks & Pilling, Leeds, for their scheme No. 2. The estimated cost was 1,586*l.* The addition to the existing main sewage disposal works comprised an alteration to the present septic tanks, a couple of percolating filters, and two storm-water settling tanks, with some more of the ground laid out for surface filtration, the estimated cost being 1,214*l.*, making the total estimated cost of works proposed about 2,800*l.*, as compared with previous schemes of 7,000*l.*, or so.



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THE Great Central Railway Company have accelerated their service to and from Rotterdam by the running of a new Continental boat express with corridor carriages and restaurant car, from Liverpool, Manchester, Sheffield, and the Yorkshire district to Grimsby, where their fine turbine steamers take passengers with speed and comfort to Rotterdam. The boat service operates on Tuesdays, Thursdays and Saturdays, with a sea passage of only eight hours, and the turbine steamers *Marylebone* and *Immingham* are equipped with every convenience and luxuriously furnished, and, what is more, the boats are provided with the latest thing in water-tight compartments, controllable by the captain on the bridge, and are capable of being closed by him in eight seconds. The route via Rotterdam is the most direct and convenient for reaching Holland, North Germany and the Rhine, and the travel and hotel facilities afforded by Messrs. Dean & Dawson enable passengers to book through to all the principal business and holiday centres at a minimum expenditure.

CEMENT TRADE MARKS.

WE have received from L'Agence de Brevets et de Marques de Fabrique, Jacques Gevers & Co., 70 Rue St. Jean, Antwerp, the following list of trade marks of Portland cement manufacturers recently published:—

BELGIUM.

TRADE MARKS PUBLISHED IN JUNE, 1909.

"HETZEL'S"	Antoine Gillis, Bruxelles.
"IMPERIAL"	Théodor Defflis, à Ixelles.
"LEVER BRAND"	Soufflet-Leblond, à Calonne-lez-Antoing.
"GOLDEN PALM BRAND"	Ditto.
"SICKLE BRAND"	Ditto.
"CITADEL BRAND"	Ditto.
"CHAMPION"	Ditto.
"THREE GUNS BRAND"	Ditto.
"DOUBLE LION"	Ditto.
"SOWERESS BRAND"	Ditto.

FRANCE.

TRADE MARKS PUBLISHED IN APRIL AND MAY, 1909.

"COQ"	Société des Ciments et Chaux du Périgord, à Saint-Astier.
"LUTTEURS"	Pierre Virabian et Co., à Marseille.

GERMANY.

TRADE MARKS PUBLISHED IN MAY, 1909.

"DYNAMO"	Portland-Cement-Fabrik Drachenberg A.G., Weserlingen.
"ELMKREUZ"	Braunschweigische Elmkalk- und Steinwerke m.b.H., Hemkenrode (Braunschweig).
"AMMONITEN-MARKE"	Kalkwerk Karl Sebald Söhne, à Nürnberg.
"DURRO"	Duroplattenwerk Konstanz G.m.b.H., Konstanz.
"BASALTOID"	Basaltoid-Unternehmen für Basaltoidpflasterung G.m.b.H., Dresden.
"ROSE VON DORNBURG"	Dornburg-Stendnisser Portlandzement- und Kalkwerke Dr. M. Frenzel, Stendnitz.
"P"	Sächsich-Thüringische Portland-Cement-Fabrik Prüssing & Co., Göschwitz.
"CONCORDIA"	Concordiahütte vorm. Gebr. Lossen, Engers a Rh.
"RHENUS"	Eilt Ulrich Janssen, Kalk-Höhenberg.
"ELMKREUZ"	Braunschweigische Elmkalk- und Stein-Werke m.b.H., Hemkenrode (Braunschweig).
"HOHENZOLLERN"	Portland-Cementwerk Balingen, Balingen.

IT is proposed to reconstruct Ranelagh Road footbridge, Paddington, at an estimated cost of 2,900*l.*, of which 2,400*l.* will be contributed by the Borough Council and 500*l.* by the Metropolitan Electric Supply Company.

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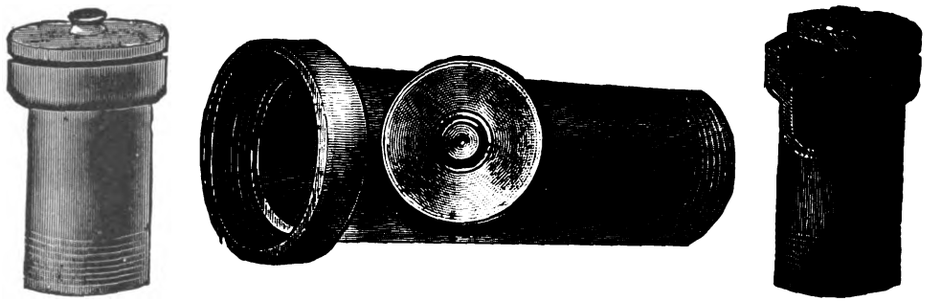
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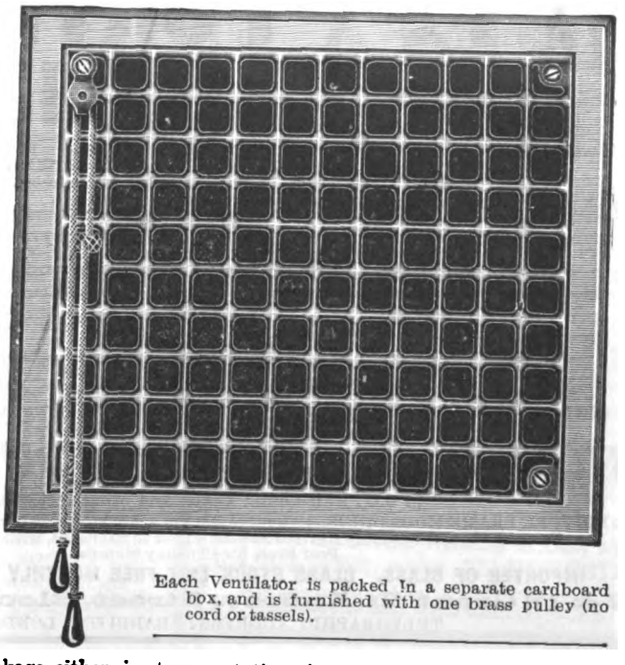
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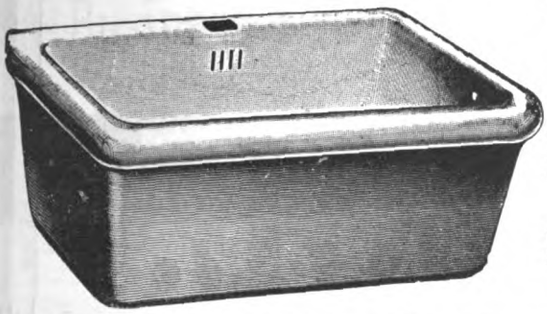
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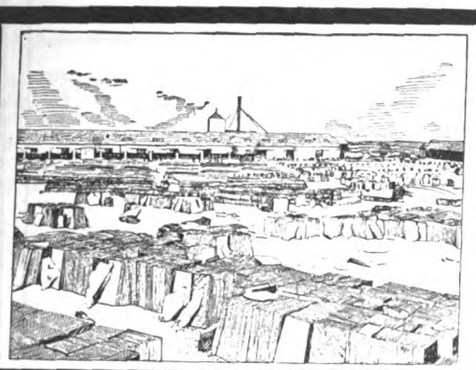
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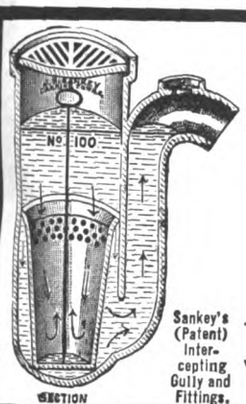
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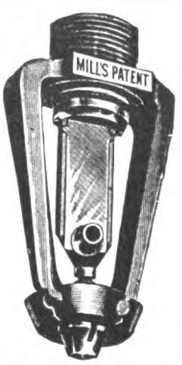
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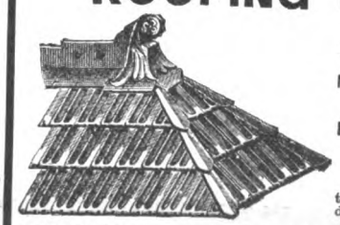
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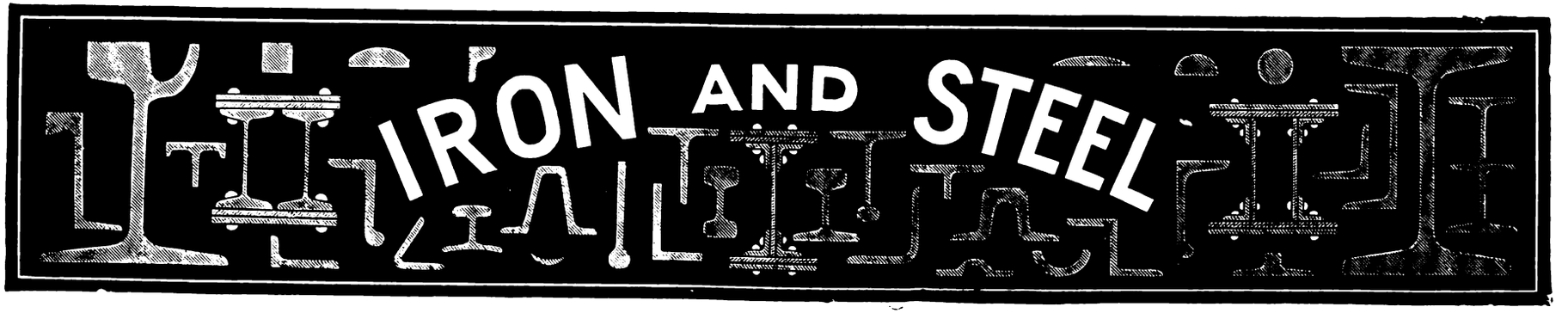
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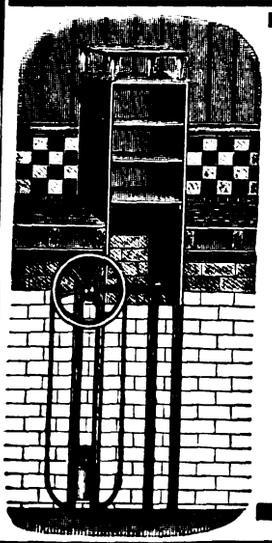
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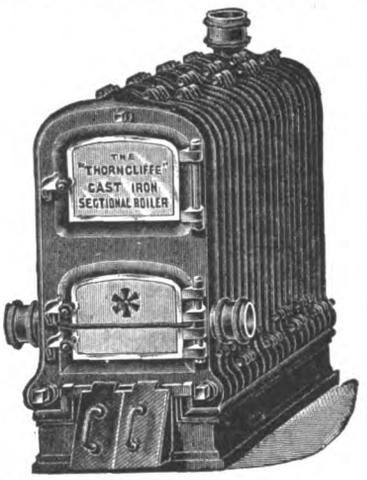
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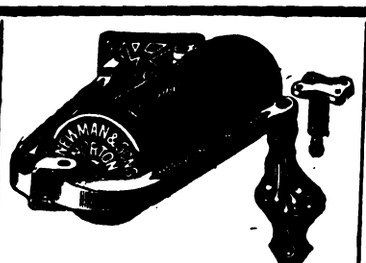
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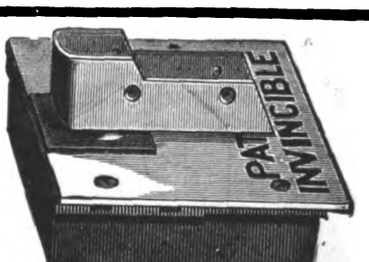


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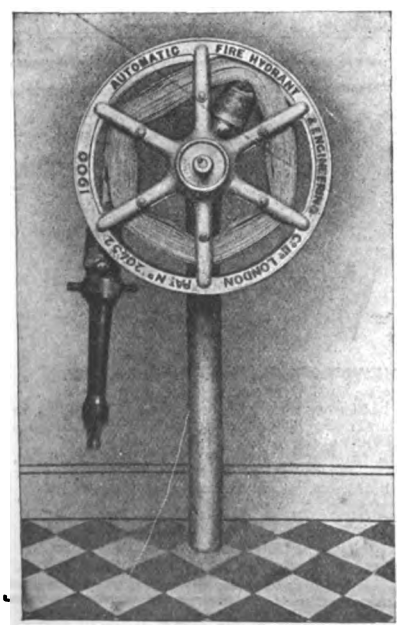
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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

DEPTFORD.—Sept. 1.—The Metropolitan Borough Council of Deptford invite designs for a branch library at New Cross, S.E. Premiums of 50 guineas, 25 guineas and 10 guineas will be awarded. Assessor, Mr. J. S. Gibson, V.P.R.I.B.A. Deposit 1*l.* 1*s.* Competition is limited to architects practising in the city or county of London. Mr. Vivian Orchard, Town Clerk, Town Hall, New Cross Road, S.E.

GLASGOW.—July 31.—The patrons of the Royal Incorporation of Hutchesons' Hospital invite designs for laying out for feuing and building about 195 acres of their lands of Thornliebank, Eastwood. Premiums of 100*l.*, 75*l.*, 50*l.* and 25*l.* will be awarded. Deposit 3*l.* 3*s.* Messrs. Hill & Hoggan, 194 Ingram Street, Glasgow.

GRIMSBY.—July 30.—For the extension of the town hall, at an estimated cost of 26,000*l.* Premiums of 250*l.*, 150*l.* and 100*l.* will be awarded. An eminent architect will act as assessor in conjunction with the borough engineer. Deposit 2*l.* Apply to Mr. H. Gilbert Whyatt, A.M.I.C.E., borough engineer, Town Hall, Grimsby.

HUDDERSFIELD.—Aug. 31.—Plans are invited for a church to seat 400, to cost about 2,000*l.*, not to exceed 2,500*l.*, with all fittings, furnishings, lighting and heating apparatus. The Rev. D. Macrae Tod, B.D., St. James's Manse, Huddersfield.

HULL.—Oct. 11.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

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NEWBURN.—Sept. 1.—The Newburn Urban District Council invite designs from architects practising in Newcastle-on-Tyne and Northumberland for new council chamber, offices and caretaker's house. The author of the best design will carry out the work; a premium of 10*l.* will be awarded to the second. Mr. R. J. Leeson (Messrs. Oliver, Leeson & Wood, architects), assessor. Deposit 1*l.* 1*s.* Mr. G. Wilkinson, clerk to the Council, Mosley Street, Newcastle-upon-Tyne.

READING.—July 31.—The Berkshire County Council invite designs for offices, committee rooms, &c., on the Forbury, Reading. Mr. Mervyn Macartney, F.R.I.B.A., assessor. Premiums of 100*l.*, 75*l.*, and 50*l.* Deposit 1*l.* 1*s.* Apply to Mr. J. Fred Hawkins, county surveyor, Bank Chambers, Cross Street, Reading.

WALES.—Oct. 1.—The Urban District Council of Aberdare invite competitive designs for a fever hospital for fifty-two patients, including administrative block, outbuildings, &c. Premiums of 100*l.*, 50*l.* and 25*l.* An assessor will be appointed on the nomination of the President of the R.I.B.A. Deposit 3*l.* 3*s.* Mr. T. Phillips, clerk, Town Hall, Aberdare.

WHITBY.—July 30.—The North Riding of Yorkshire County Council education committee invite designs for a secondary school. Mr. Paul Waterhouse, assessor. Apply to the Secretary, Education Offices, County Hall, Northallerton.

CONTRACTS OPEN.

ALLONBY.—Aug. 7.—For the erection of cloak-rooms, &c., to Allonby Council school, Cumberland. The education committee's Clerk of Works, 13 Earl Street, Carlisle.

ALVERTHORPE (YORKS.).—July 30.—The West Riding small holdings and allotments committee invite tenders for the following works:—Low Farm, Silcoates, Alverthorpe, alterations and repairs to buildings; Top Farm, ditto. The West Riding Architect, County Hall, Wakefield.

BARNSTAPLE.—July 24.—For pulling down Nos. 4, 5 and 6 Vicarage Street, and erecting temporary fence. Mr. E. Y. Saunders, P.A.S.I., borough surveyor, The Strand, Barnstaple.

BEDFORD.—July 29.—For erection of additional offices and Council Chamber, forming an extension of the Shire Hall. Deposit 2*l.* 2*s.* Send names to Mr. H. P. Adams, architect, Shire Hall, Bedford.

BELFAST.—July 28.—For erection of a weighbridge office, bridge pit, &c., and the erection of an existing weighbridge on the Donegall quay, for the Belfast Harbour Commissioners. Mr. W. Redfern Kelly, M.I.C.E., harbour engineer, Harbour Office, Belfast.

BICKERSTAFFE (LANCS.).—Aug. 9.—For the construction and erection of an engine and boiler-house, chimney, cottages and other buildings, near Royal Oak. Deposit 5*l.* 5*s.* Messrs. H. Rofe & Sons, civil engineers, 8 Victoria Street, Westminster, S.W., and Oxford Chambers, Victoria Square, Leeds.

BIRKENHEAD.—July 26.—For alterations and additions to the bakery at the Birkenhead Union Workhouse. Deposit 2*l.* 2*s.* Messrs. E. Kirby & Sons, architects, 5 Cook Street, Liverpool.

BISHOP'S STORTFORD.—July 29.—For erection and completion of a high school for girls. Deposit 2*l.* 2*s.* Send names by July 17 to Messrs. Talbot, Brown & Fisher, architects, Wellingborough.

BLYTH.—Aug. 6.—For alterations and additions at Custom House. H.M. Office of Works, Pink Lane, Newcastle-on-Tyne.

BOCKING (ESSEX).—July 23.—For erection of manual training centre, New Road, Bocking, for the Braintree District sub-committee of the Essex education committee. Forward names to the Clerk to the Braintree D.S.C., County High School, Braintree.

BOLTON.—July 28.—For erection of (*a*) the Astley Bridge and Great Lever branch libraries. Messrs Bradshaw & Gass, F.R.I.B.A., architects, 19 Silverwell Street, Bolton. (*b*) The Halliwell branch library. Messrs. Henderson & Brown, architects, Fold Street, Bolton.

BRIDGNORTH.—July 27.—For alterations, &c., in connection with the reopening of the third archway of the North Gate. The Borough Surveyor, Bridgnorth.

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BRISTOL.—July 30.—For the construction and maintenance for twelve months after completion of brick-built offices at Onega Wharf, Cumberland Road. Mr. W. W. Squire, engineer, Cumberland Road, Bristol. Send 3*l.* deposit to the Secretary of the docks committee, 19 Queen Square, Bristol.

CAMBORNE.—July 27.—For new slate roof for the Centenary Wesleyan Methodist Church. Mr. Sampson Hill, architect, Green Lane, Redruth.

CANTERBURY.—July 29.—For sundry repairs to the Kent and Canterbury Hospital. Secretary, 46 St. George's Place, Canterbury.

CONGLETON.—July 29.—For alterations and additions at the Mossley school, comprising new infants' class-rooms, cloak-rooms, offices for boys, girls and infants, and drainage, &c. Deposit 3*l.* 3*s.* Mr. C. Russell Hall, architect, Chapel Street, Congleton.

COVE AND HAWLEY (HANTS).—August 9.—For erection of a Council school for 140 children at Cove. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

DEWSBURY.—July 31.—For erection of a warehouse in Mill Street East, Savile Town. Deposit 1*l.* 1*s.* Messrs. C. H. Marriott, Son & Shaw, Church Street Chambers, Dewsbury.

DUDLEY.—July 26.—For erection of a storage battery house. The Borough Electrical Engineer, Electricity Works, Bull Street, Dudley.

GLASGOW.—Aug. 2.—For the following works in connection with buildings to be erected in Moore Street and Hill Street, viz.:—(1) Digger, mason and brick works; (2) joiner work; (3) iron and steel works; (4) plumber work; (5) slater work; (6) plaster and pavior works; (7) asphalte work; and (8) painter work. Deposit 5*l.* 5*s.* Office of Public Works, City Chambers, 64 Cochrane Street.

GORLESTON-ON-SEA.—July 26.—For erection of a Primitive Methodist church, Nile Road. Mr. Arthur S. Hewitt, A.R.I.B.A., architect, Bank Chambers, Great Yarmouth.

GRAVESEND.—July 24.—For the following work for the education committee:—(*a*) Painting and sundry repairs to Church Street schools; (*b*) decorating the interior of Wrotham Road schools; (*c*) additional painting and decorating to the cookery school; (*d*) redecorating, &c., interior of St. James's schools. The Borough Surveyor's Office, Town Hall.

GRIMSBY.—July 26.—For alterations to 69 Cleethorpe Road. Mr. H. Gilbert Whyatt, A.M.I.C.E., borough engineer and surveyor, Town Hall, Grimsby.

HARRINGTON.—For building four Newcastle kilns and also chimney 100 feet high at the Micklam Brickworks, Cumberland. Mr. Gass, manager, the Harrington Iron and Coal Company, Harrington.

HARROGATE.—July 28.—For additions and alterations to the United Methodist church and schools. Deposit 10*s.* 6*d.* Mr. W. Hugill Dinsley, architect, Chorley, Lancashire.

HARTLEPOOL.—Aug. 4.—For erecting offices for dock master, and cabin for dock head men at Victoria Dock, for the North-Eastern Railway Company. The Station Master at Hartlepool, and Mr. William Bell, the company's architect, York.

HERNE BAY (KENT).—July 27.—For erection of a cloak-room and improved heating. Mr. Geo. Jackson, correspondent, Beltinge, Herne Bay, Kent.

HORDEN.—July 26.—For erection of Sunday schools and class-rooms at Horden, near Castle Eden, Durham. Send names to Mr. J. Walton Taylor, F.R.I.B.A., St. John Street, Grainger Street West, Newcastle-upon-Tyne.

HULL.—Aug. 4.—For erection of a waterguard station for H.M. Customs at Hull, for the North-Eastern Railway Company. The Station Master, Paragon Station, Hull, and Mr. William Bell, the company's architect, York.

HULL.—July 29.—For the following work in the extension of Madeley Street baths:—Contract No. 3, builder and joiner work; No. 4, heating and circulating pipes. Mr. A. E. White, M.I.C.E., city engineer, Town Hall, Hull.

LEEK (STAFFS.).—For (1) the erection of the Grand Theatre in High Street; (2) for fitting up the building with heating apparatus; and (3) for wiring the building for electric lighting. Deposit 3*l.* 3*s.* The Leek Theatre Company, Ltd., 6 Ford Street, Leek.

IRELAND.—July 28.—For erection of a public sanitary convenience in the People's Park, Limerick. Mr. J. J. Peacocke, city surveyor, Town Hall, Limerick.

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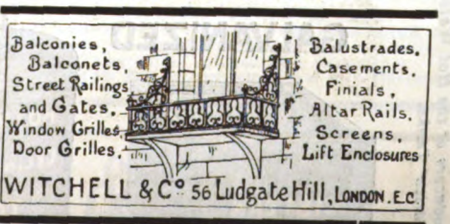
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LONDON.—July 26.—For erecting a mortuary keeper's cottage in St. Mary Magdalene Gardens, Holloway Road, N., for the Islington Borough Council. Deposit 2*l.* 2*s.* Mr. J. Patten Barber, borough engineer, Town Hall, Upper Street, N.

LONDON.—July 28.—For the erection of a building and covered way at the workhouse, Hazelville Road, Hornsey Rise, N., to be used as a temporary room for drying purposes, for the Shoreditch Guardians. Mr. F. J. Smith, F.R.I.B.A., Parliament Mansions, Victoria Street, S.W.

LONDON.—Aug. 19.—The Commissioners of H.M. Works and Public Buildings invite constructional schemes and tenders based thereon for erection in reinforced concrete of the new building for the Money Order Department of the Post Office at Manor Gardens, Holloway, N. Deposit 3*l.* 3*s.* Mr. J. Wager, A.R.I.B.A., M.C.I., at H.M. Office of Works, &c., Storey's Gate, S.W.

LOW MOORSLEY.—July 31.—For the building of premises at Low Moorsley, for the Low Moorsley Amicable Industrial Society, Ltd., Hetton-le-Hole, co. Durham.

NEWBOLD MOOR.—July 28.—For erection of a parish hall, fence walls and other work at Newbold Moor, near Chesterfield. Deposit 3*l.* Messrs. Rollinson & Son, architects, Corporation Street, Chesterfield.

NEWCASTLE-UPON-TYNE.—July 31.—For the internal walls, sanitary fittings, floors, tiling and joiner work for a men's public convenience under the approach roadway to bridge, Milk Market. Deposit 1*l.* 1*s.* The City Engineer's Office, Town Hall, Newcastle-upon-Tyne.

MADELEY.—July 30.—For entire work of erection of the Madeley secondary school at Coalbrookdale, for the Salop County Council. Deposit 2*l.* Send names at once to Mr. Joseph Holt, A.R.I.B.A., 9 Albert Square, Manchester.

OLD TRAFFORD.—Aug. 4.—For erection of an infant school at Old Trafford, Manchester, for the Stretford education committee. Mr. Ernest Woodhouse, F.R.I.B.A., 88 Mosley Street, Manchester.

PLYMOUTH.—Aug. 2.—For the completion of platform coverings at Plymouth (North Road) Station, the steelwork for which is already fixed, for the Great Western Railway Company. The Engineer at Plymouth (North Road) Station.

PRESTON-NEXT-WINGHAM (KENT).—July 26.—For execution of summer repairs at the Council school. Rev. W. D. Lindley, correspondent, Elmstone Rectory, Dover.

RADLETT.—July 28.—For erection of detached cottage at Radlett, Herts. Mr. C. Gordon Samson, architect, Oldfield, Bournemouth.

RICHMOND (SURREY).—July 26.—For erection of a convenience (for men and women), and a store in the North Sheen recreation ground. Deposit 1*l.* 1*s.* The Borough Surveyor, Town Hall, Richmond.

ST. BURYAN.—July 31.—For erection of Council school at St. Buryan, Cornwall. Mr. Sampson Hill, architect to the committee, Green Lane, Redruth.

SEATON SLUICE.—July 27.—For erection of Wesleyan Methodist Chapel. Deposit 1*l.* 1*s.* Messrs. Joseph Potts & Son, architects and surveyors, 57 John Street, Sunderland.

SHEFFIELD.—Aug. 10.—For erection of the Training College Hall of Residence for Men, and also for the heating and the electric lighting of same. Messrs. Gibbs & Flockton, architects, 15 St. James Row, Sheffield.

SOUTHAMPTON.—July 26.—For the following works for the education committee:—(1) Pulling down and re-erecting certain latrines and playsheds at the central district Council school, and (2) reconstructing the draining and the provision of new sanitary fittings at the St. Denys Council school. Deposit 2*l.* 2*s.* The Education Offices, St. Mary's Road, Southampton.

STRADBROKE.—July 31.—For alterations and new cloakrooms at Stradbroke schools. Mr. Frampton, Stradbroke, Suffolk.

SUTTON (KEIGHLEY).—For erection of a detached residence. Messrs. Moore & Crabtree, architects, Cooke Street, Keighley.

TIVERTON.—July 31.—For certain additions and alterations to old house, Blundell's School. Deposit 2*l.* 2*s.* Messrs. A. P. I. Cotterell & Carr, architects, 28 Baldwin Street, Bristol.

TORPOINT.—July 31.—For erecting Council schools. Mr. B. C. Andrew, architect to the Cornwall education committee, Biddick's Court, St. Austell.

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WALES.—July 24.—For erection of an entrance porch and new boundary walls, &c., at the Mission Church, Deri, near Bargoed. Mr. D. M. Davies, M.S.A., architect, 38 Cardiff Road, Caerphilly.

WALES.—July 26.—For erection of thirty houses at Wattstown, Rhondda Fach, for the Wattstown No. 1 Building Club. Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd.

WALES.—July 26.—For erection of a higher standard mixed school, to accommodate 160 scholars, with laboratory, manual instruction centre, offices, and boundary walls, at Miskin, Mountain Ash. Deposit 1*l.* 1*s.* Mr. W. H. Williams, architect, Town Hall, Mountain Ash.

WALES.—July 28.—For additions to the Merthyr General Hospital. Mr. C. M. Davies, architect, Merthyr.

WALES.—July 29.—For alterations and additions and decorations of Cymmer Welsh Congregational Chapel, Cymmer, Porth. Mr. W. D. Thomas, architect and surveyor, Tydvil House, Porth, Glam.

WALES.—July 29.—For erection of ten semi-detached houses for the Fleur-de-Lis Building Club (No. 4), near Cardiff. Mr. W. S. Nash, Fleur-de-Lis, near Cardiff.

WALES.—July 29.—For erection of a Congregational school, chapel and class-rooms, together with other buildings, &c., at Port Talbot. Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

WALES.—July 30.—For erection and completion of isolation hospital at Croes Ynyd, near Conway, consisting of administrative block, three isolation wards, discharging block, laundry, disinfector, mortuary, stable and coach-house, boundary walls, &c. Deposit 2*l.* 2*s.* Mr. T. B. Farrington, Trinity Square, Llandudno.

WALES.—July 31.—For erection of a fire station, &c., at Llandaff. Mr. J. H. Thomas, architect, Pentwyn, Llandaff.

WALES.—July 31.—For alterations, &c., to shop, Crugan, Pwllheli. Mr. Griffith Jones, ironmonger, Pool Street, Carnarvon.

WALES.—Aug. 6.—For erection of higher elementary schools, with cookery centre, laundry and caretaker's house, at Stow Hill, Newport, Mon. Deposit 3*l.* 3*s.* The Architect, Town Hall, Newport.

WHITEHAVEN.—July 24.—For erection of two semi-detached houses on the Hensingham Road. Mr. A. Huddart, architect, 9 Lowther Street, Whitehaven.

WILLESBOROUGH (KENT).—July 26.—For the execution of summer repairs at the Council school. Mr. T. W. Wilde, Albemarle Road, Willesborough, Ashford.

WREXHAM.—July 24.—For alterations to disinfecting chamber, ambulance shed, dining-room and larder, at the Joint Fever Hospital. Mr. J. Price Evans, engineer, Argyle Chambers, Wrexham.

TENDERS.

ACTON.

For interior and exterior painting of the Acton county school, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

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CARDIFF.

For supply of cast-iron socket-pipes of 3-inch to 12-inch diameter, together with about 30 tons of irregulars and special castings which may be required in laying the same. Mr. C. H. PRIESTLEY, M.I.C.E., waterworks engineer.

Macfarlane, Strang & Co.	£2,198 12 6
McEwan & Co.	2,184 12 6
Cochrane & Co. (Cochrane Grove branch)	2,076 5 0
Oakes & Co.	2,032 0 0
Spittle	2,027 3 9
Staveley Coal and Iron Co.	2,017 18 4
Sheepbridge Coal and Iron Co.	1,995 11 8
Clay Cross Co.	1,993 15 0
Cochrane & Co. (Woodside)	1,963 15 0
Stanton Iron Works Co.	1,960 12 6
Holwell Iron Co.	1,937 0 0
JORDANS, Pellgweally Foundry, Newport, Mon. (*accepted*)	1,882 16 3

COVENTRY.

For raising roof over part of machine shop. Messrs. TAIT & HERBERT, architects, Leicester and Coventry.

Moss & Sons	£838 0 0
Wellerman	684 0 0
Gray	671 0 0
Elliott	662 0 0

ENFIELD.

For laboratory fittings for the Enfield county school, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

North of England School Furnishing Co.	£347 0 0
Treasure & Son	319 0 0
Bennett Furnishing Co.	316 15 0
Hammer & Co. (*recommended*)	310 0 0

GUILDFORD.

For the construction of the necessary superstructural buildings (upon foundations already completed) over the refuse destructor plant and machinery at Bellfields, Stoke. Mr. C. G. MASON, A.M.I.C.E., borough engineer and surveyor.

F. & H. Higgs	£4,065 0 0
Fry	4,040 0 0
Bullen	4,018 0 0
Tribe & Robinson	3,995 0 0
MANLOVE, ALLIOTT & Co., Nottingham (*accepted*)	3,990 0 0
Wells	3,965 0 0
Wood & Son	3,953 0 0
F. & G. Foster	3,945 0 0
Rowland Bros.	3,886 0 0
Crosby & Co.	3,878 0 0
Drowley & Co.	3,816 0 0

HAINE, NEAR RAMSGATE.

For alterations and additions at the receiving block, Isle of Thanet Joint Hospital Board, Haine. Mr. H. B. LANGHAM, architect, Broadstairs.

Strand	£755 0 0
Seager	719 0 0
Baker	703 12 0
Paramors	699 10 0
Forewalk	685 0 0
Ballard & Co.	673 10 0
Attwood & Co.	668 0 0
Rattray	665 6 0
Miriam	659 0 0
Paramor & Sons	650 0 0
May	602 11 8
Woodhall & Son	587 10 0
Goodbourn	520 0 0
WHITE, Ramsgate (*accepted*)	486 0 0

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HALLING.

For painting and renovating the mixed and infants' departments and the headmaster's house, and for alterations to offices at the mixed school.

Bines	£350	0	0
Goodwin	246	0	0
Biddlecombe	210	0	0
Sellick & Son	170	0	0
Osborne	160	18	0
Swain & Stanley	128	0	0

HARROW.

For new county school at Harrow, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

Neal	£15,550	0	0
Holliday & Greenwood	15,400	0	0
Rider & Son	15,218	0	0
Mattock Bros.	14,987	0	0
Appleby & Sons	14,915	0	0
Johnson & Co.	14,721	0	0
Minter	14,687	0	0
Holloway Bros	14,600	0	0
Kearley	14,484	0	0
Perry Bros.	14,397	0	0
F. & H. Higgs	14,320	0	0
Mattock & Parsons	14,274	0	0
Treasure & Son	14,138	0	0
Lawrence & Son	13,822	0	0
Knight & Son (*recommended*)	13,336	0	0

For new Council school at Harrow, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

Mattock Bros.	£10,100	0	0
Neal	9,690	0	0
Tout	9,246	0	0
Kearley	9,095	0	0
Haynes	9,000	0	0
Renshaw	8,988	0	0
Rowley Bros.	8,905	0	0

HARROW—*continued.*

Porter	8,779	0	0
Gough & Co.	8,699	0	0
Lacey	8,647	0	0
Dickens	8,602	0	0
Lawrence & Son	8,482	0	0
Treasure & Son	8,410	0	0
Knight & Son (*recommended*)	8,121	0	0

HOLME CULTRAM.

For the erection of a ladies' lavatory on Silloth Green.

Accepted tenders.

Hill, Carlisle, builder	£135	9	0
Longcake, joiner work	78	15	0
Ferguson, plumber	49	12	11
Harrington, plasterer	20	2	0
Hill & Sons, painter	15	14	7
Irving, slater	11	0	0

ISLEWORTH.

For interior and exterior painting of the Green school, Isleworth, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

Dorey & Co.	£188	0	0
Heath	149	0	0
Poore & Son	147	12	0
Lacey	145	0	0
Blackburn	139	10	0
Jamieson (*recommended*)	132	0	0

KILBURN.

For laboratory fittings for the Kilburn Grammar School, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

Lawrence & Son	£174	0	0
Hammer & Co.	173	0	0
Bennett Furnishing Co.	171	1	3
North of England School Furnishing Co. (*recommended*)	171	0	0



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LEICESTER.

For new heating chamber at the Museum and Art Gallery. Messrs. TAIT & HERBERT, architects, Leicester and Coventry.

Kellett	£600 0 0
A. & W. Chambers	598 0 0
Tyers & Yates	595 0 0
Smith	587 0 0
Elliott	576 0 0

LYNTON.

For erecting Wesleyan church and school. Messrs. LATROBE & WESTON, F.R.I.B.A., Bristol.

Yandle & Sons	£3,057 15 10
Stanbury	2,500 0 0
Jones	2,176 0 0
Pickett	2,023 10 6
Sillifant	2,012 0 0
BOVEY & SON, Torquay (*accepted*)	2,000 0 0

LONDON.

For the erection on the Manor Lane site, Lewisham, of an elementary school for the accommodation of 817 children.

Parker & Sons	£19,441 0 0
F. & H. F. Higgs	19,251 0 0
Perry & Co. (Bow)	18,718 0 0
Marsland & Sons	18,160 0 0
Smith & Sons	18,007 0 0
Holloway	17,983 0 0
Appleby & Sons	17,926 0 0
Garrett & Son	17,884 0 0
Longley & Co.	17,860 0 0
Holliday & Greenwood	17,524 0 0
Wallis & Sons	17,443 0 0
Kirk & Randall	17,134 0 0
F. & T. Thorne	17,126 0 0
Wall	17,120 5 4
Leng	17,018 0 0
J. & C. Bowyer	16,985 0 0
Thomas & Edge	16,709 0 0
F. & E. Davey (*recommended*)	16,235 2 7
The estimate of the architect (education)	17,600 0 0

LONDON—*continued.*

For the construction of the southern low-level sewer No. 2 from Deptford to Battersea.

Perry & Co. (Bow)	£583,610 0 0
Price & Reeves	562,945 0 3
Pearson & Son	539,616 12 3
Scott & Middleton	527,037 16 0
Muirhead & Co.	525,873 13 2
The Westminster Construction Co.	514,000 0 0
Mowlem & Co.	499,768 0 0
Nowell	473,575 10 3
Shellabear & Son (*recommended*)	473,416 13 6
The chief engineer's estimate	480,000 0 0

The main drainage committee recommend that Messrs. G. Shellabear & Son be allowed to sublet to the undermentioned firms or to such other firms as may be approved by the chief engineer, the manufacture of the undermentioned articles:—Cast-iron segments—the Stanton Ironworks, Ltd., near Nottingham; the Staveley Coal and Iron Co., Ltd., near Chesterfield. Bolts and nuts—Messrs. Bayliss, Jones & Bayliss, Cannon Street, E.C.; the Phœnix Bolt and Nut Co., Ltd., Handsworth, Birmingham; and Messrs. G. Shakespear & Co., Darlaston. Portland cement—the Associated Portland Cement Manufacturers (1900), Ltd., Lloyd's Avenue, E.C.; Messrs. Trechmann, Weekes & Co., near Rochester.

For erecting two additional staircases at the Farrance Street school, Limehouse.

Parrott & Isom	£3,177 0 0
Jackson	3,047 2 0
Glendinning	2,745 18 1
Appleby & Sons	2,714 0 0
Wallis & Sons	2,546 0 0
Price	2,532 0 0
Staines & Co.	2,414 0 0
J. & M. Patrick	2,339 0 0
Griggs & Son	2,310 0 0
J. & C. Bowyer	2,291 0 0
Holliday & Greenwood	2,222 0 0
Leng (*recommended*)	2,183 0 0
The estimate of the architect (education)	2,355 0 0

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LONDON—*continued.*

For the erection of a bandstand shelter to take the place of the temporary platform at Boundary Street Garden.

The Wire-wove Roofing Co. and the Portable Buildings Co.	£325 0 0
Griggs & Son	291 0 0
F. & G. Foster	283 0 0
Vigor & Co.	259 0 0
Parrott & Isom	251 0 0
Gladding & Co.	245 0 0
Chamberlain	237 4 0
Newell & Lusty	230 0 0
Wood	217 0 0
Nightingale	215 0 0
Jackson	215 0 0
Pike (*recommended*)	189 0 0

For the erection of laundry and housewifery centres on the Dalgleish Street site, Limehouse.

Symes	£1,953 0 0
Roberts & Co.	1,948 0 0
Newell & Lusty	1,914 6 5
Friday & Ling	1,890 1 10
Kazak	1,857 3 9
Griggs & Son	1,826 0 0
Holloway	1,783 0 0
Thomas & Edge	1,746 13 0
J. & C. Bowyer	1,734 0 0
Leng (*recommended*)	1,728 0 0
The estimate of the architect (education)	1,857 0 0

For painting, &c., at schools, for the Chiswick Urban District Council.

Hogarth Girls' School.

Plumridge	£362 10 0
Blackburn	345 17 6
Martin	303 10 0
MILLMAN (*accepted*)	215 15 0

Belmont School.

Plumridge	£211 0 6
Martin	190 12 6
Blackburn	180 1 0
MILLMAN (*accepted*)	162 5 0

LOWESTOFT.

For erection of an additional ward pavilion and for addition to the administrative block at the sanatorium, Rotterdam Road. Mr. G. H. HAMBY, A.M.I.C.E., borough surveyor.

Partington & Son	£2,504 0 0
Wales	2,197 0 0
Roper	2,097 0 0
Hawes & Son	2,075 0 0
Youngs & Son	2,059 0 0
Barham	2,048 19 10
Kenney	1,995 0 0
Carter & Wright	1,985 17 9
Self	1,959 0 0
Bedwell & Parker	1,904 16 0
Spencer, Santo & Co.	1,887 16 8
Mobbs Bros.	1,879 15 0
Cole	1,841 0 0
BECKETT, Oulton Broad (*accepted*)	1,786 15 0

MORTLAKE.

For paving the carriageways of the Upper Richmond Road and the unpaved portion of the High Street, for Barnes Urban District Council. Mr. G. BRUCE TOMES, A.M.Inst.C.E., Council House, High Street, Mortlake, S.W.

Smith	£15,885 13 4
Pethick Bros.	15,851 18 4
E. & E. Iles	15,620 10 0
Complete Wood Flooring Co.	15,395 6 0
Homer & Co.	14,800 11 8
Jarman & Co.	13,400 0 0
Griffiths & Co.	12,354 13 10
Wimpey & Co.	11,908 18 6
Acme Flooring and Paving Co.	11,602 18 8
Mowlem & Co.	11,564 0 0
IMPROVED WOOD PAVEMENT Co., 46 Queen Victoria Street, E.C. (*accepted*)	11,221 10 0
Starkey	11,114 7 6

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NORTHAMPTON.

For the erection of additional offices at the County Council buildings.

CLARKE, Derngate (*accepted*)	£3,058	0	0

NORTHWOOD.

For new Council school at Northwood, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

Lacey	£5,193	0	0
Fassnidge & Son	5,129	0	0
Fryer & Co.	5,102	0	0
Hill Bros.	5,089	0	0
Brown	4,986	0	0
Mattock & Parsons	4,971	0	0
Page	4,965	0	0
Renshaw	4,955	0	0
Kearley	4,866	0	0
Batchelor	4,850	0	0
Try & Hancock	4,833	0	0
Dickens	4,762	0	0
Gough & Co.	4,740	0	0
Hawkins & Co. (*recommended*)	4,730	0	0

SLAD (GLOS.).

For proposed Congregational Sunday school. Messrs. TAIT & HERBERT, architects, Leicester and Coventry.

Burdvell	£760	0	0
Large	687	0	0
Poulton & Son	680	0	0
Baxter & Son	596	0	0
Ford & Son	546	0	0
Freeman	540	0	0

STOCKPORT.

For erecting an infants' school in Lewis Road, North Reddish, Stockport, for the education committee. Messrs. CHEERS & SMITH, architects, Blackburn and London. Quantities by architects.

BRIGGS. Heaton Norris, Stockport (*accepted*)	£4,122	0	0

SOUTHAMPTON.

For erection of a police station and coroner's court at Payne's Road, Freemantle.

BUCK, JUN. (*accepted*)	£1,118	0	0
Borough engineer's estimate	1,230	0	0

SPALDING.

For supply of 7 miles, or thereabouts, of 12-inch internal diameter cast-iron pipes and specials. Mr. JOHN BAILEY, M.I.M.E., town surveyor.

Birtley Iron Co.	£7,282	3	4
Cochrane & Co.	6,299	0	9
Oakes & Co.	6,125	4	9
Staveley Coal and Iron Co.	5,917	7	8
Stanton Iron Works Co.	5,895	19	1
Clay Cross Co.	5,891	14	10
HOLWELL IRON Co., Melton Mowbray (*accepted*)	5,586	11	0

STANLEY.

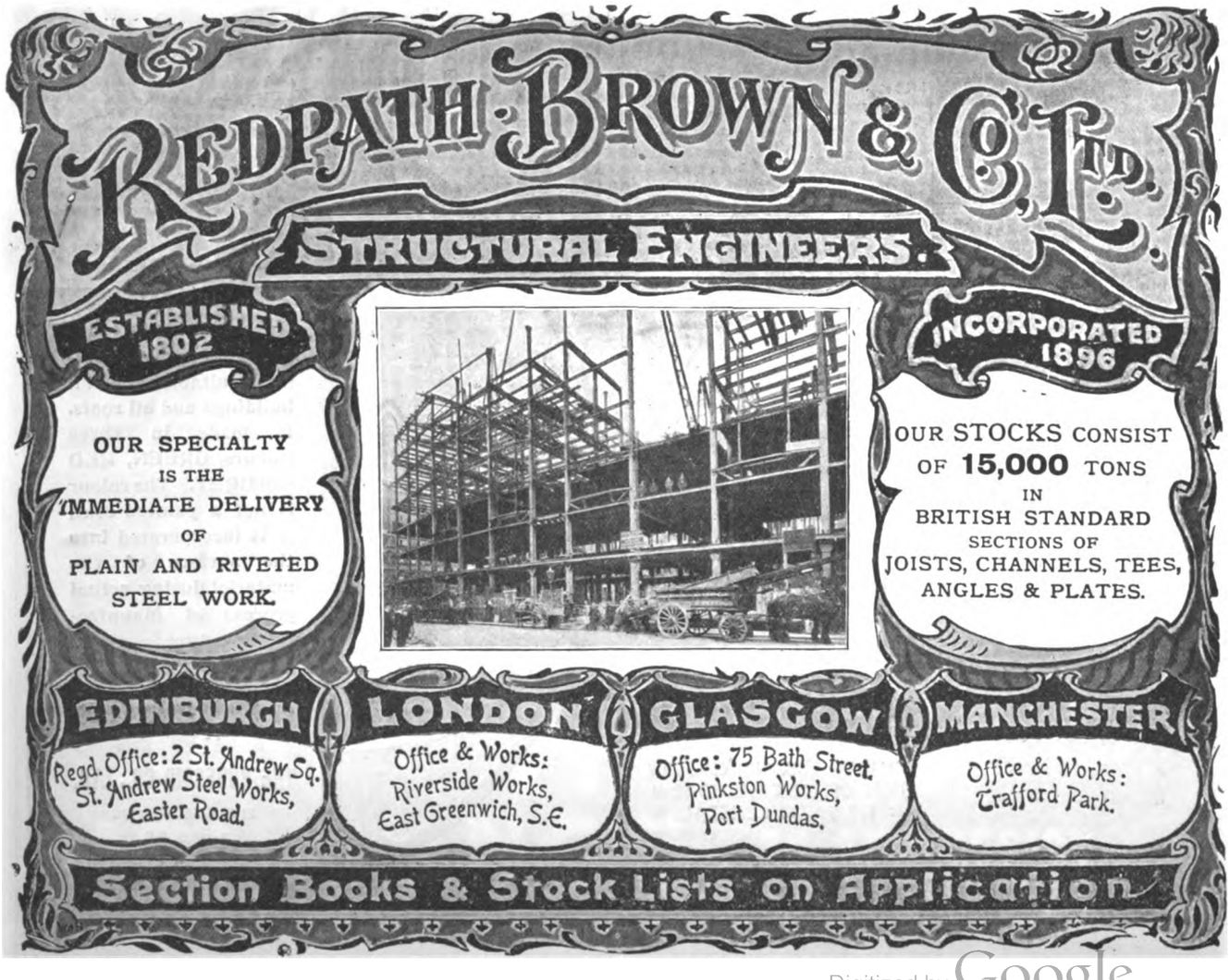
For forming and completing several private streets at South Moor and Oxhill, Durham. Mr. JOSEPH ROUTLEDGE, surveyor.

South Moor Streets.

Doran	1,660	3	0
Crombie	1,498	2	1
Ressell	1,484	14	5
Rule	1,429	1	2
Simpson	1,211	19	1
McLaren	1,091	2	11
Birtley	1,087	15	4
JOHNSON & STRONG, Stanley (*accepted*)	1,035	12	8
Shunnon	891	10	3

Back Coronation Street, Oxhill.

Ressell	£418	13	2
Doran	403	19	8
Lee & Dunn	396	16	6
Crombie	363	15	8
Rule	341	2	0
Simpson	292	14	10
Johnson & Strong	272	14	6
McLaren	268	18	4
BIRTLEY, Stanley (*accepted*)	261	12	1
Shunnon	210	15	7



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ILLUSTRATIONS.

INTERIOR OF CHURCH OF ST. AGNES, LIVERPOOL.

OXFORD COLLEGE SERIES, KEBLE—INTERIOR OF CHAPEL.

PELHAM SCHOOL, WIMBLEDON.—PLANS—THE BOYS' ASSEMBLY HALL—CORRIDOR, GIRLS' SCHOOL—CLASS-ROOM, INFANTS' SCHOOL—HEAD-MISTRESS'S ROOM, GIRLS' SCHOOL—A COMMUNICATION DOOR—CLOAK-ROOM, BOYS' SCHOOL.

TATTENHALL.

For erection and completion of a house at Tattenhall, near Chester.

Carriel & Son	£997 0 0
Froude	975 0 0
Parker	985 0 0
Reeas Bros.	950 0 0
Wright	915 0 0
Davis & Co.	900 0 0
Greenhalgh & Co.	857 0 0
Rowlands	850 0 0
Barlow	840 0 0
Carl & Co.	820 0 0
Atherton	800 0 0
Vicker & Co.	670 0 0

TOTTENHAM.

For interior painting of the Tottenham Polytechnic, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

Stewart	£169 15 0
Porter	128 0 0
Brown Bros.	122 0 0
Treasure & Son (*recommended*)	118 0 0

For new heating scheme for the Tottenham high school for girls, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

Bailey & Son	£944 1 3
Wontner-Smith & Co.	599 0 0
Rosser & Russell	596 0 0
Fox	460 0 0
Haden & Son (*recommended*)	340 0 0

TIVERTON.

For erection and completion of school building, for the Governors of the Middle Schools and School of Art, Devon. Mr. W. H. ASHFORD, A.R.I.B.A., architect, Birmingham.

Bryer	£8,123 0 0
Wakeham Bros.	7,489 0 0
Dart & Francis	7,397 0 0
Grater & Sons	7,285 0 0
Cowlin & Son	7,030 0 0
Westcott, Austin & White	6,959 0 0
Spiller & Son	6,890 0 0
Walters & Son	6,787 0 0

WALES.

For erection of a Council school for 350 children, at Greenfield, near Holywell, Flintshire. Mr. S. EVANS, county surveyor, Mold.

Mayers, Son & Co.	£5,200 0 0
Jones & Sons	4,865 3 7
Rogers	4,620 0 0
Spencer	4,560 0 0
Price Williams	4,557 0 0
Sibeon Bros.	4,555 0 0
Lloyd	4,497 0 0
Dallow & Sons	4,487 0 0
Griffiths	4,350 0 0
R. Williams	4,320 10 9
BLANE & SON, Connah's Quay (*accepted*)	4,100 0 0

For reconstruction of the Northop Hall Council school, Flintshire. Mr. S. EVANS, county surveyor, Mold.

Probert	£2,122 7 0
Mayers, Son & Co.	2,010 0 0
Rogers & Sons	1,998 18 0
Blane & Son	1,950 0 0
Griffiths	1,913 0 0
Lloyd	1,910 0 0
Spencer	1,899 0 0
R. Williams	1,894 8 9
P. WILLIAMS, Overton (*accepted*)	1,755 0 0

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WALES—*continued.*

For erection of villa residence and outbuildings in Neath Road, Maesteg. Mr. E. WHITFIELD BURNETT, M.S.A., architect, Maesteg.

W. & J. R. Watson	£1,297	0	0
Newman	1,130	0	0
O'Brien	1,116	0	0
THOMAS BROS, Maesteg (*accepted*)	1,086	0	0

For erecting a Baptist chapel at Llanwrtyd Wells. Mr. E. PETERS MORRIS, architect, Llandrindod Wells.

Williams	£2,699	0	0
Page	2,527	0	0
Lloyd	2,500	0	0
Davies	2,492	0	0
TURFORD & SOUTHWARD, Ludlow (*accepted*)	2,256	0	0

WEALDSTONE.

For new Council school at Wealdstone, for the Middlesex County Council. Mr. H. G. CROTHALL, architect to the education committee.

Mattock Bros.	£9,160	0	0
Tout	9,113	0	0
Kearley	9,000	0	0
Gough & Co.	8,920	0	0
Lacey	8,908	0	0
Haynes	8,900	0	0
Rowley Bros.	8,806	0	0
Renshaw	8,625	0	0
Dickens	8,496	0	0
Lawrence & Son	8,422	0	0
Treasure & Son	8,384	0	0
Knight & Son (*recommended*)	8,140	0	0

WALSALL.

For erection of a vicarage in connection with the Church of St. Mary and All Saints', Palfrey, Walsall.

WILLETTS & SONS, Old Hill (*accepted*)	£1,650	0	0

YARMOUTH.

For the extension of the administrative block at the Sanatorium, and the provision of a new pavilion.

BECKETT, Carlton and Lowestoft (*accepted*)	£1,786	0	0

WALTHAMSTOW.

For painting, distempering, &c., to the Forest Road and Gamuel Road schools, for the Walthamstow education committee. Mr. H. PROSSER, M.S.A., architect to the committee, Education Committee Offices, Walthamstow.

Forest Road Schools.

Barton	£504	0	0
Tranter	382	8	0
Page	378	14	0
Penn	370	5	0
Wick	367	0	0
Brand, Pettit & Co.	361	0	0
Coxhead	347	0	0
Robbins	318	0	0
Hammond & Son	312	0	0
LUCAS, Walthamstow (*accepted*)	287	16	0
Surveyor (Council's Works Department)	412	10	0

Gamuel Road Schools.

Page	548	0	0
Barton	452	0	0
Robbins	417	0	0
Wick	368	0	0
Tranter	363	8	0
Penn	350	15	0
Brand, Pettit & Co.	332	0	0
Coxhead	317	0	0
Lucas	303	9	0
HAMMOND & SON, Romford (*accepted*)	287	0	0
Surveyor (Council's Works Department)	354	4	0

Received too late for Classification.

BIRMINGHAM.

For providing and fixing low pressure hot water heating apparatus in the new technical school, Smethwick, for the education committee. Mr. F. J. GILL, architect.

HOLLINGS & GUEST, Birmingham (*accepted*)	£670	0	0

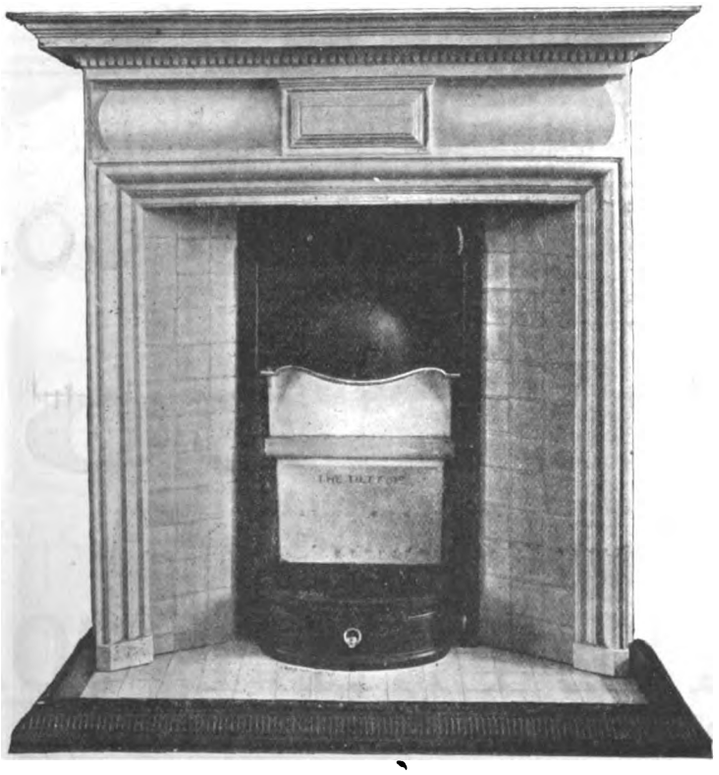
LANGLEY.

For erecting a school building for Oldbury Urban District Council. Mr. F. J. GILL, architect, Smethwick.

MARSHALL, West Smethwick (*accepted*)	£12,237	0	0

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LUTON.

For erection of a library at the junction of George Street and Williamson Street. Mr. S. F. L. Fox, borough engineer and surveyor.

Beardsmore & West	£10,638 0 0
Honour & Son	10,590 17 0
Kirk & Randall	10,192 0 0
Coulson & Lofts	9,858 0 0
White	9,816 0 0
Bloxham	9,810 0 0
Drever	9,779 3 0
Dunham	9,772 0 0
W. & D. Wilkins	9,700 0 0
Thompson & Sons	9,690 0 0
Flint	9,697 0 0
Minter	9,548 0 0
Heath	9,466 17 0
Hickman	9,369 0 0
Hunt & Son	9,362 0 0
Hacksley Bros.	9,324 0 0
Spencer, Santo & Co.	9,189 0 0
Lewin & Sons	9,100 0 0
Bentley & Co.	8,909 11 0
Brown & Son	8,880 0 0
T. & E. NEVILLE, Luton (*accepted*)	8,873 0 0
Saunders & Son	8,776 0 0
Barber & George	8,374 18 5

TRADE NOTES.

MESSRS. A. & T. BURT, LTD., of New Zealand, have opened a London office under the charge of one of their directors, Mr. J. A. Burt, to execute the buying for their New Zealand houses.

NEW premises have recently been erected at 92 High Street, Notting Hill Gate, London, for the London City and Midland Bank, Ltd., the interior fitting-up of which was entrusted to and beautifully executed by Messrs. Harris & Sheldon, Ltd., bank, shop and office fitters, Stafford Street, Birmingham. The work is carried out to the architect's design and specification in figured walnut, with bronze metal embellishments, and is another example of Messrs. Harris & Sheldon's accuracy of detail and superiority of finish.

A NEW INDUSTRY.

OUR attention has been called to an interesting inception of what at present is in its embryo stage merely a village industry, but bids fair to become of considerable importance. Lady Amy Baker recognising the possibilities of the white clay of Hampshire and Dorset, quite a different material from the china clay of Cornwall, has been making experiments with this clay, both alone and combined with others, and has shown the possibility of producing, merely by the burning of mixed clays with the white as a basis, quite a remarkable material, much resembling marble in appearance, and capable of an excellent polish. The artistic merit of the resulting product is that the exact disposition of the mingled veins of colour is fortuitous, and so has much of the charm of natural veining in marble. The practical merit is that as regards durability, hardness and strength, the material is a high-grade type of pottery. Thus whether the pure white clay is used, which when burnt is much of the colour of Bath stone, or coloured mixtures, there is a large field open for the application of the new material.

THE directors of John Oakey & Sons, Ltd., have declared an interim dividend on the ordinary shares for the half year ending June 30 last, at the rate of 10 per cent. per annum, payable on September 1, 1909.

MR. LEWIS JOHN ERIC HOOPER, nephew of the chairman, and Mr. John Cuthbert Bailey, J.P., for many years manager of the company's Burslem works, have joined the Board of Doulton & Co., Ltd.

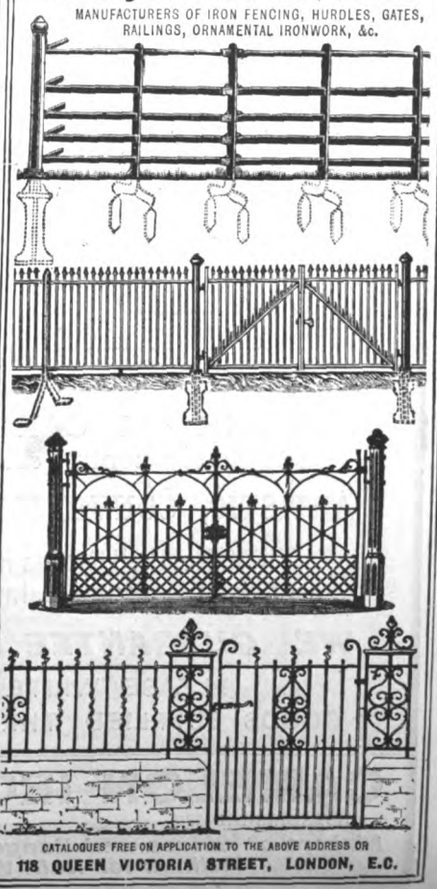
THE Southend-on-Sea Corporation propose spending nearly 14,000*l.* on electrical sub-stations at Chalkwell Park and the Thorpe Hall estate, in the western and eastern portions of the borough respectively.

THE Marylebone Borough Council have under consideration the selection of a site for a new town hall to be built, at an estimated cost of 44,000*l.* The sites mentioned are that occupied by the vacated girls' charity school, Marylebone Road, and one in Seymour Place, off the same road.

EST. 1836
THE LIVERPOOL AND LONDON AND GLOBE INSURANCE COMPANY
Total Assets Exceed £11,000,000.
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— ANNUITIES, —
PERSONAL ACCIDENT.
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Security £4,607,705.
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FIRE — ACCIDENT — MARINE
This Company also issues Policies covering
LOSS OF PROFITS AND INCOME
occasioned by Fire.

SAVE 50%
OF YOUR
COAL BILL
BY USING THE PATENT
"SINE QUA NON" KITCHEN RANGE.
RECENT TESTIMONIAL.
[Copy] 46 Newcastle St., London, E.
June 8, 1909.
GENTLEMEN,—You will no doubt be pleased to hear that the "Sine Qua Non" Range we recently had from you is giving every satisfaction; we understand that the amount of coal consumed is practically one half of what the old range consumed.
We are, Gentlemen, yours faithfully,
(Signed for A. EATON & CO., LTD.,)
J. H. STONEHOUSE, Director.
This unsolicited testimonial, with many others, may be seen at, and Catalogues obtained on application to, the Sole Manufacturers,
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VARIETIES.

MR. THOMAS HISCOCK, of Hounslow, builder, left estate valued at 23,471*l.* gross, of which 9,036*l.* is net personalty.

MR. R. A. SKELTON, late surveyor to Sandgate, has been appointed surveyor and inspector of nuisances to the Wilton Rural District Council at a salary of 230*l.* a year.

MR. EDWARD GOOD, of Sutton in Holderness, Yorkshire, and of Hull, builder and contractor, who died on May 11, left estate valued at 54,391*l.* gross, with net personalty nil.

THE Weston-super-Mare Town Council have arranged to place a galvanised-iron roof under the grand pier, and thus provide shelter for 2,000 persons. Additional shelter accommodation also is to be provided on the parade.

A LOCAL GOVERNMENT inquiry was held in Bedford last week regarding the proposal of the Bedford Corporation to borrow 15,000*l.* for a dust destructor, 25,775*l.* for completion of the water supply scheme, and 11,000*l.* for enlarging the mains.

A SERIES of eight or ten articles on "The Wiring and Fixing of Telephones" has been commenced in *Electricity*. It deals with ordinary installations and should appeal to everyone who has to instal, maintain, or repair telephones. A special feature is the original diagrams.

THE foundation stones of the Thornton Heath Spurgeon Memorial Church were laid on July 19. The building is of late Gothic design with red brick facings and stone dressings. The contract is let to Messrs. Battley, Sons & Holness, 21 Old Kent Road, S.E., and amounts to 3,215*l.* The architects are Messrs. George Baines & Son, 5 Clement's Inn, Strand, W.C.

DR. REGINALD FARRAR, Government medical officer, in his report on the sanitary circumstances of Oldham, recommends that the Corporation should acquire some of the many squalid empty spaces (the sites of old mills and dwelling-houses) which deface certain parts of the borough, and should convert them into gardens or playgrounds, properly fenced in.

THE Royal Sanitary Institute have appointed Professor Henry Adams, Dr. Louis C. Parkes, Professor W. Napier Shaw and Mr. A. Saxon Snell, F.R.I.B.A., as the adjudicators for the next "Henry Saxon Snell Prize" competition, the subject set being "The Principles of Heating and Ventilating Public Buildings." The essays have to be delivered at the Institute, 90 Buckingham Palace Road, by August 31.

WORKSOP College, Nottinghamshire, is to be enlarged. The new buildings will include a science block, drawing and music rooms, a dormitory, library, masters' rooms and class rooms. The gift of 10,000*l.* by Lord Mountgarrett will enable the permanent chapel to be built at the same time. The work has been entrusted to Sir Aston Webb, R.A. The building will begin at once, and the foundation-stone of the chapel will be laid on July 29.

THE Yarmouth Town Council have under consideration a scheme for the erection of public baths. A deputation inspected baths belonging to the Borough Councils at Battersea, St. Pancras, Islington and Beckenham, and the Turkish baths at Northumberland Avenue, the property of a private company. "Nearly all the groups of buildings visited," the report states, "were of the most complete type, and were more costly than anything which could be expected to be remunerative at Yarmouth." The borough surveyor has prepared plans which will cost 16,000*l.* inclusive of machinery. The matter has been deferred until October 1.

THE monthly meeting of the Yorkshire Federation of Building Trades Employers was held at the Albemarle Hotel, Scarborough, last week. A discussion took place with respect to a draft sub-contract for use of principals and sub-contractors, and it was subsequently referred to a committee to consider and report. Mr. T. Lindley, of Barnsley, explained the draft proposal agreement between the National Association of Master Plasterers and the National Association of Operative Plasterers. Several conferences had taken place between a joint committee, and as a result a draft agreement had been arrived at which was more favourable to the employers than the one it has been substituted for. The Federation passed a resolution approving of the revised agreement.

AUGUST BANK HOLIDAY ON THE CONTINENT.—Tickets at reduced fares available for eight days will be issued to Brussels July 28, 29, 30, 31, and August 2, and to Zurich

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Register, Interior, or Mantel Register.

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Blower, Swing Canopy and Damper combined.
SIMPLE in CONSTRUCTION and ACTION (no part can get out of order).
BLOWER is hidden behind canopy when not in use, and when wanted is EASILY LOWERED and REPLACED (no fastening required).
BLOWER quickens or revives a fire.
DAMPER and CANOPY save fuel and completely control combustion.
ARTISTIC, CONVENIENT, INEXPENSIVE.

The "Hestia" Grates hold the Certificate of the Incorporated Institute of Hygiene.

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ESTABLISHED 1845.
Telegrams: "CAMELON, FALKIRK."
Makers of Stoves and Ranges; Baths (Porcelain, Vitreous and Metallic Enamelled); Pipes and Fittings for Rain Water, Soil, Hot Water and Gas; Furnace Pans, &c., &c.

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via Harwich and Antwerp. Dining and breakfast cars are run between London and Parkeston Quay, Harwich, on the Antwerp service. Passengers leaving London in the evening reach Brussels next morning, affer a comfortable night's rest on board the steamer. For visiting The Hague, Scheveningen (the Dutch Brighton) and Amsterdam for the dead cities of the Zuyder Zee, special facilities are offered *via* the Great Eastern Railway Company's British Royal Mail Harwich-Hook of Holland route. Turbine steamers between Harwich and the Hook of Holland, and corridor trains with vestibuled carriages, dining and breakfast cars between London and Harwich. From the Hook of Holland through carriages and restaurant cars are run to and from Amsterdam and in the North and South German express trains to Cologne, Bâle and Berlin, reaching Cologne at noon, Bâle and Berlin in the evening. Tickets can be obtained dated in advance and cabins or berths reserved at the Continental Enquiry and Booking Offices at Liverpool Street Station.

DR. H. W. BEACH, medical officer of health, Yarmouth, in the course of his annual report, says that during the year a portion of the North Denes has been laid out as building land, under the conditions of a garden suburb. This is an important step in the direction of proper town planning, and indicates a great change in public opinion during the past 25 years, as the adjacent Corporation estate was laid out to accommodate from 40 to 44 houses per acre, whereas there will not be more than five to nine houses per acre on the present estate, the area covered by buildings on the old estate being five-eighths of the whole site, while the corresponding fraction on the garden suburb will be from one-fifth to one-third. Although the houses on this particular estate will be too large for occupation by the working classes, its planning marks a great advance on any previous scheme for the development of the Corporation estates, and it will tend to the more careful consideration of future plans for the housing of the working classes.

NATIONAL REGISTRATION OF PLUMBERS.

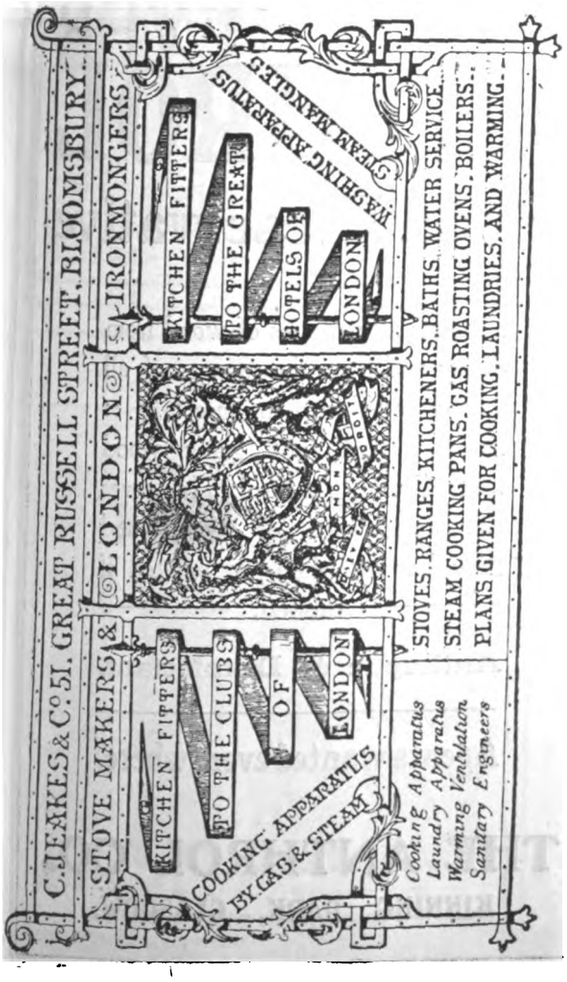
THE Mayor of Winchester (Councillor F. W. King) presided at the annual meeting of the Hants, Dorset and Isle of Wight local Council of the National Registration of Plumbers. There was a large number of delegates, and among those supporting the Mayor were Mr. James Lemon, C.E. (chairman of the Council), Mr. Mathews, C.E., Mr. A. J. Crowther (borough surveyor, Southampton), Mr. Cooper (chief sanitary inspector, Bournemouth), Mr. Lord (city surveyor, Winchester), Mr. A. W. Bull, Mr. Morton, Mr. Stutchbury and others.

In opening the proceedings the Mayor said he fully realised the good work the Association was trying to do—namely, to educate the public up to the requirements of modern sanitation and to get rid of undesirable members of the trade. He knew the importance of this, as the evil effects of bad plumbing had been brought home to him, as he had nearly lost his life through serious defects in the sanitary work of a house he formerly inhabited.

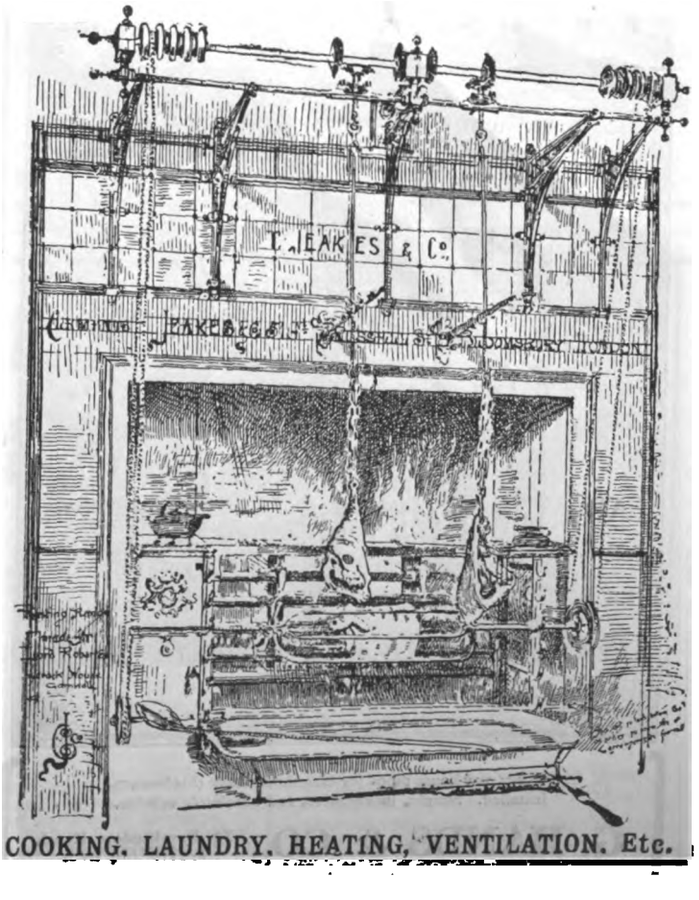
Another subject he was glad to see the Association was taking up and that was the revival of apprenticeship. He hoped that not only plumbers but other trades would revert to the old system of apprenticeship, as he felt sure it helped to steady the character, as well as to make efficient workmen. It likewise settled lads into a definite course from the start.

Mr. Lemon said his first duty was to thank the Mayor for his kindness in presiding, and for granting them the use of the building for that meeting. He then proposed the following resolution, which was carried unanimously:—

"That this meeting of Master and Operative Plumbers, representatives of public authorities, water companies and the general public, desires to express its hearty approval of the system of registration inaugurated so successfully by the Worshipful Company of Plumbers, London, twenty-three years ago, which has developed into the great organisation of the National Registration of Plumbers, affirms its conviction that the system is conceived in the best interests of the craft and of the public health, is for the benefit of the community, and is therefore worthy of being maintained and pressed forward by all available means. The meeting would also urge upon master and operative plumbers who have not yet become registered to do so now, and by their co-operation and support assist in the attainment of the very desirable objects aimed at by the movement. The meeting further calls upon the Government to grant facilities for the re-introduction of the Plumbers' Registration Bill, which has twice passed its second reading in the House of Commons and passed through all its stages in the House of Lords, with a view of having it passed into law next session."



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BUILDING TRADE IN GERMANY.

THE annual report on the trade of the consular district of Berlin for the year 1908 contains many interesting sidelights on the building trade of that capital and of the entire German Empire during the past year. Mr. Consul-General Schwabach lays emphasis on the general depression from which almost all branches of trade and industry had to suffer, though not to any alarming extent. One of the contributory causes to this absence of gravity in the economic situation was the decrease in labour disputes; and to this special notice will be given below. The principal cause, however, is considered to have been the growth of population, which enabled German industry during the last twelve months to depend upon the home market. Since 1882 the population has increased from forty-five to sixty-one millions. The classification of persons engaged in building may be taken as a typical instance. In the 1882 census the total was 946,583, or 5.84 per cent.; in 1895 the number was 1,353,637, or 7.16 per cent.; while in 1907 it had increased to 1,905,987, with a percentage of 7.74.

It appears from the structural iron and ironmongery statistics that the exports of girders, pipes, railway rails and enamelled kitchenware dropped during 1908, and, on the other hand, that the export of rough rails and blocks, as well as of iron rods and sheets, increased. The cement industry, which is largely dependent on its export trade, suffered severely during 1908, as exports declined considerably, this being especially the case in the purchases of cement by the United States. The largest customer is Austria-Hungary, where in 1907 as many as 682,088 tons were sold, while last year it fell to 520,345 tons; the figures for the United States are 79,835 tons and 29,267 tons respectively.

Strikes and Lock-outs.—The thrift of the working population has been of late years considerably checked and the economic development of the country greatly retarded by the large number of labour disputes. The year 1908 was practically free from such influences. This bears out once more an axiom taught by experience—namely, that in times when work is scarce the tempers of the quarrelsome elements are apt to cool down, while the diminution in the power of the unions and the favourable position of employers make strikes of rare occurrence. Similarly, the number and the extent of lock-outs are reduced, since this weapon is used chiefly by employers as a means of self-defence and as a deterrent against strikes.

In connection with the strike movement it is perhaps not out of place to direct attention to statistics showing the membership of the prime movers in these strikes. The following totals for Greater Berlin shows the membership of eighty of the greatest organisations of German workmen, the so-called "free unions" (with social democratic tendencies):—On January 1, 1906, the total was 223,339; twelve months later it had risen to 254,798; while on January 1, 1908, it fell to 235,980.

It is worthy of note that the membership decreased between January 1, 1908, and December 1, 1908, and that the building trade is exclusively responsible for this decline. The unions of masons and bricklayers and the labourers in these trades—i.e., woodworkers, joiners and painters—show throughout a decline in membership on December 31, 1908. The primary cause was, of course, the continued slackness in the building line, but there is also another reason; the more aggressive members of the different bodies, seeing that their unions were disposed to effect amicable settlements of disputes (the unions, indeed, being compelled in their own interest to adopt this attitude), turned their backs on them. In marked contrast to the "free" unions are the so-called "yellow" unions, whose special aim is the promotion of those interests which employer and employed have in common. Their numbers and their influence are at present very inconsiderable.

Scale of Wages Contract in the German Building Trade.—A general wages agreement which was arrived at in the building trade in the spring of 1908 terminated the fierce struggle which had been carried on for some time, and by this means a trade of great economic importance has been saved for some years to come from the constant danger of being involved in serious strikes and lock-outs through want of a generally recognised and valid collective labour contract. The employers, who are organised as the "German Employers' Association for the Building Trade," in the same way as the workmen have their compact central organisations, had drawn up a draft for the preparation of wage contracts, but this met with violent opposition on the part of the men. At one time it seemed as if no reconciliation

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Protects all varieties of wood from decay and from the ravages of all :: wood-destroying insects :: Animals will not gnaw wood treated with Anthrol. Improves the appearance of wood and may be varnished or painted if desired.

Antiseptic & Disinfectant.

Agents wanted everywhere.

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KINNING PARK, GLASGOW.

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could be brought about between the Association and the workmen's unions, and it was expected that on April 1, 1908, 300,000 men would be locked out. However, at the last moment the two parties moderated their demands and an agreement was arrived at.

The reason the men had for not agreeing to the draft contract was that it contained stipulations likely to have an exceedingly injurious effect on their position. For example, the draft provided a rate of pay for "capable" workmen, and it was left to the discretion of employers to say who was to be regarded as a capable workman and who was not. Then, again, overtime was made compulsory, whereas previous contracts contained no such provision. Further, the draft, by forbidding "all attempts at agitation on working premises on pain of instant dismissal," made efforts of an agitatory kind impossible. It is true that previously agitation had not been altogether permitted, yet the prohibition had not been understood as applying to builders' shelters, whilst now, in the draft, these places were explicitly declared to form a component part of the working premises. Finally, the stipulation that whenever a local wages-list had been agreed to within the district of the Employers' Association, such list was only to apply after all pending disputes had been satisfactorily settled, and the instructions of the Employers' Association to local organisations not to reduce the working day below ten hours made the draft unacceptable to the men. The negotiations, which took place on March 25 and 26, between the representatives of the German Employers' Association for the Building Trade on the one hand and the leaders of the Trade Unions of Masons, Joiners and Builders' Labourers, including the "Christliche Bauarbeiter Verband," on the other, resulted in the men giving up their demand for the introduction of the eight-hour day, with the proviso, however, that wherever the working day was already shorter than ten hours it should remain unaltered. Further, and in deference to the wish of the men, the employers relinquished the stipulation that the agreement scale of wages should be guaranteed to capable workmen only.

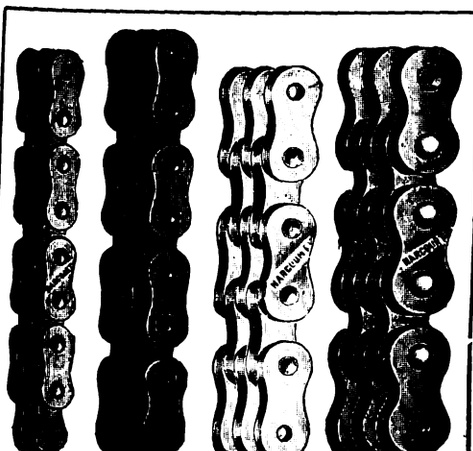
One of the most hotly contested points was the question of agitation, but the protracted negotiations ultimately resulted in a compromise, expressed in the following clause of the agreement:—"Every kind of agitation during working hours is prohibited. Non-organised workmen, or those belonging to other organisations, must not be interfered with, either before or after working hours, or on the premises during intervals between work." As the result of a resolution, it was decided that the leaders of the men should accept March 31, 1910, as the date of the termination of the agreement, provided the question of the amount of wages to be paid was left to local arbitration. The agreement of March 25 and 26 provided a practical basis for the local negotiations for the determination of wages and working hours, which were to be concluded by April 18 and placed before the Employers' Union on April 22.

The negotiations for Berlin were opened on April 9 and 10. In their proposals the employers offered a wage of 65 pf. (nearly 8*d.*) per hour to masons and joiners, and of 45 pf. (5½*d.*) per hour to labourers, as against the rates of 75 pf. (9*d.*) and 50 pf. (6*d.*) respectively which had been paid up to the end of 1907. An ordinary day was to consist of nine working hours. In opposition to this the men asked for payment upon the scales embodied in a decision arrived at by the Arbitration Board of the Berlin Industrial Court, viz.:—

	Per Hour. Pfennigs.
1907 to end of March 1908 . . .	78
1908 ,, ,, 1909 . . .	80
1909 ,, ,, 1910 . . .	82

The employers declared that in view of the total change in the state of trade they could not agree to this scale, and negotiations were broken off as hopeless. On April 26 representatives from the central committees of employers and workmen met at Berlin in order to discuss the points of difference left open in the course of the local negotiations. Neutral arbitrators were appointed, and, after exhaustive deliberations, they made the following award:—(1) The scale of payment should nowhere be reduced; (2) wherever increased rates had been already agreed upon for the period included in the agreement such increments should hold good; (3) wherever local employers' organisations had, during the disputes, offered increases in the scale of wages, whether verbally or in writing, such increases should be unconditionally granted; (4) in districts where no rise of wages had

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BREAKING STRAINS.
250 lbs. 380 lbs. 600 lbs. 800 lbs.

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Sash Chains
MADE of COPPER with C.M. RIVETS.
WORKS SMOOTHLY AND NOISELESSLY.
— NO COGS NEEDED. —
SOLD BY ALL HARDWARE MEN.
BEST AXLE PULLEYS TO SUIT.
AMONG MANY OTHER PLACES:
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The Technical Institute, Belfast.
The "Scotsman," Edinburgh.
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The Post Office, Montreal.
The New Lunatic Asylum, Bristol.
The Houses of Parliament, Brisbane.
The Holborn Viaduct Buildings, London.
The New Library, Pollokshields.
The Asylum, Letterkenny.
The Dykebar Asylum, Paisley.
The Metropolitan Carriage Works, Saltley.
The Royal Artillery Barracks, Manchester.
The Cottage Hospital, Walsall.
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The Stores of A. T. Stewart, Esq., New York.
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The City Asylum, Birmingham.
Also on all the leading Steamship Lines, including "The Cunard," "The White Star," "The Dominion," "The P. & O.," "The North German Lloyd," &c., &c.

been granted from April 1, 1906, nor fixed in advance for April 1, 1909, the rate of payment should be increased by 1 pf. per hour, commencing on April 1, 1908; (5) in every district an arbitration board with a neutral chairman should be immediately appointed by the organisations concerned, and the boards should pronounce a final award by May 16 on those points in dispute not immediately connected with the wages question; (6) the parties must notify the neutral arbitration board not later than 11 A.M. on May 4, 1908, as to whether they are prepared to abide by the award or not.

On May 4, 1908, the above award was accepted by the men's organisations, and peace has thus been assured in the German building trade until 1910.

This agreement is of the greatest importance, not only to the building trade proper, but also to German trade as a whole, and it incidentally provides a means of judging the attitude adopted by the great bodies which represent masters and men in labour disputes. Impartial judges will be able to discern the great value attaching to the settlement of disputes affecting large interests by the representatives of organisations who have an insight into economic conditions and who are keenly alive to the responsibility vested in them; settlements on these lines are, in fact, a necessity whenever the number of masters and bodies of men concerned is so large that separate agreements would require laborious and protracted negotiations in order to attain uniformity.

Cement.—In consequence of the depression in private building activity the consumption of cement diminished. While in 1907 about 2,500,000 tons were used for Berlin buildings, over 500,000 tons less were required in 1908, a reduction due partly to the raising of prices by the syndicate, though outsiders continued to offer their products at cheap rates in Berlin; as, however, this competition only became acute in the second half of 1908, when the depression was still increasing in intensity, no perceptible effect was produced on the consumption. In view of the prevailing slackness and in order to create a demand, the syndicate reduced the prices for 1909 to the level of 1907, a measure dictated partly by necessity and partly with the object of counteracting the underselling tactics of outsiders, and particularly those of the new works in Upper Silesia, which are attempting to gain a firm footing in Berlin by means of considerable reductions in price.

As was to be expected from the favourable position of agriculture, building operations in the rural districts were livelier than in the cities, but it is very doubtful whether rural consumption was able to compensate for urban deficiencies. The activity displayed in the erection of public works, especially the continuation of canal construction, operated in some degree to increase the demand for cement, and the more extensive use of ferro-concrete is opening new fields, though Berlin builders are rather sceptical as to its advantages for buildings above ground. So far only a small number of Berlin architects have decided to adopt it to any great extent, in spite of the fact that in other parts of Germany the roofs, beams and trusses of large buildings are constructed with that material. It is believed that the use of ferro-concrete, by prolonging the time necessary for building, must increase expenditure on interest. As a matter of fact, ferro-concrete was largely used in the construction of the great warehouse on the Teltow Canal. In the construction of walls, pillars, &c., for bridges and underground structures this material has met with favour in Berlin, and some of the Berlin suburbs have placed considerable orders for concrete drain-pipes, some of which are to receive an acid-resisting coating.

WE notice that the Great Central Railway Company has considerably improved the train service between London (Marylebone) and the commercial centres of Yorkshire. This company inaugurated the general use of restaurant cars on the main line expresses, and the ability to obtain meals "per rail" is not only a great convenience but an appreciable time-saver. Buffet cars leave Marylebone at 8.45 A.M., 10.0 A.M., 12.15, 1.50, 3.15, 4.30 and 6.20 P.M. for Sheffield, Huddersfield, Halifax, Bradford, Wakefield, Leeds, York, &c. The 1.50 and 3.15 P.M. expresses from Marylebone have been accelerated for Denby Dale, Brockholes, Holmfirth, Honley, Huddersfield, Halifax, Bradford, &c., and the 3.15 has a non-stop run from Marylebone to Sheffield. Commencing July 16, through carriages for Scarboro' and the North-East Coast will be run on the expresses leaving Marylebone at 10.0 A.M. and 12.15 P.M., and an equivalent service operates in the reverse direction.

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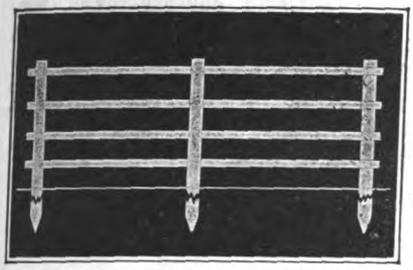
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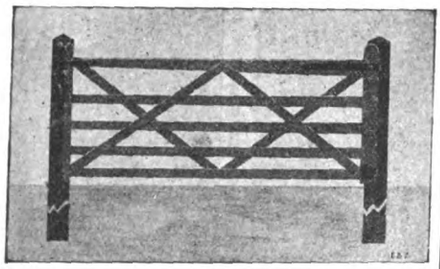
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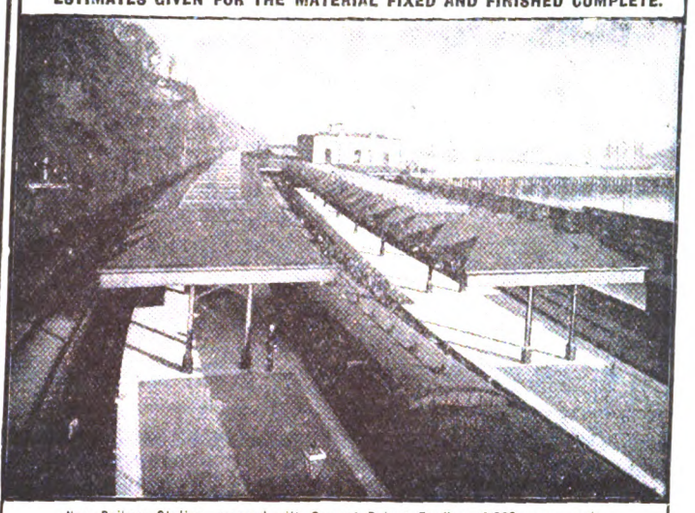
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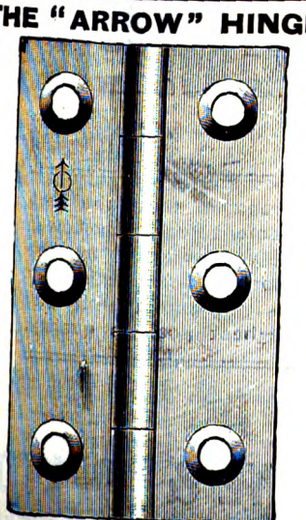
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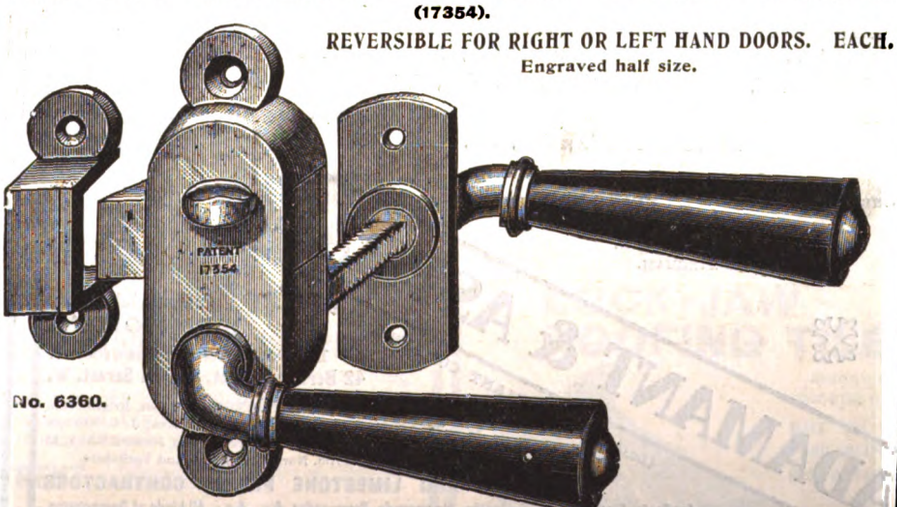
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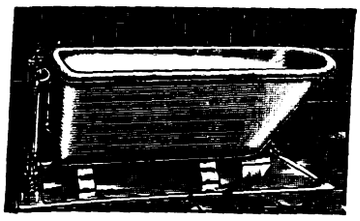
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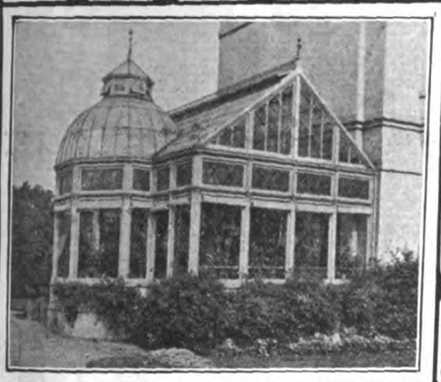
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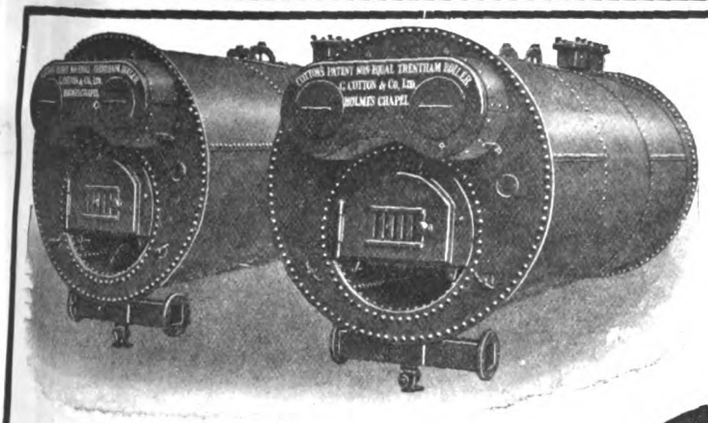
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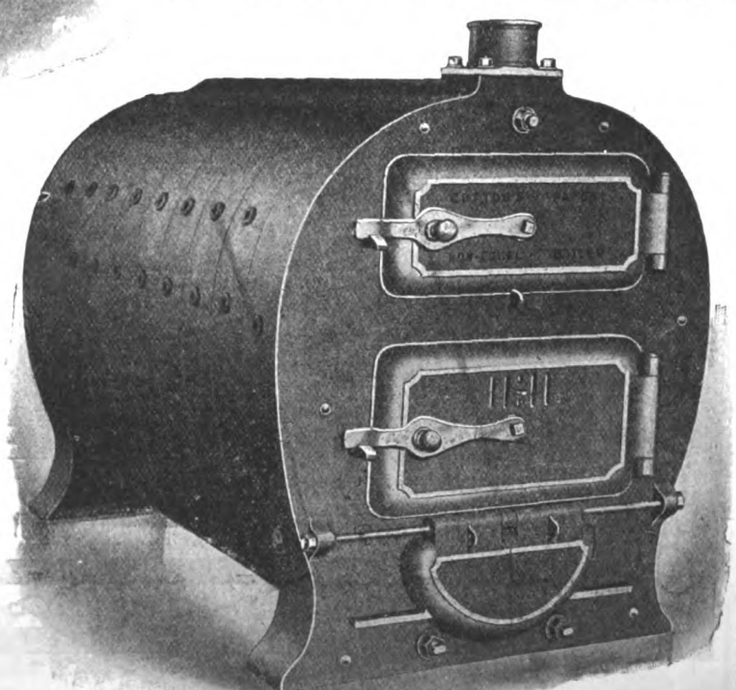


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The Contract Reporter.

to The Architect.

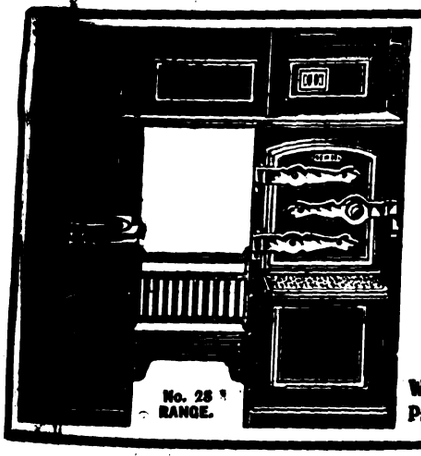
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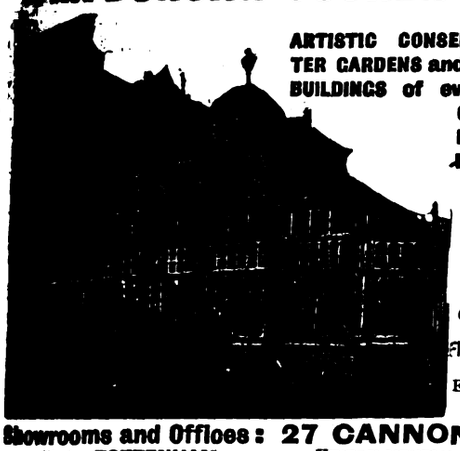
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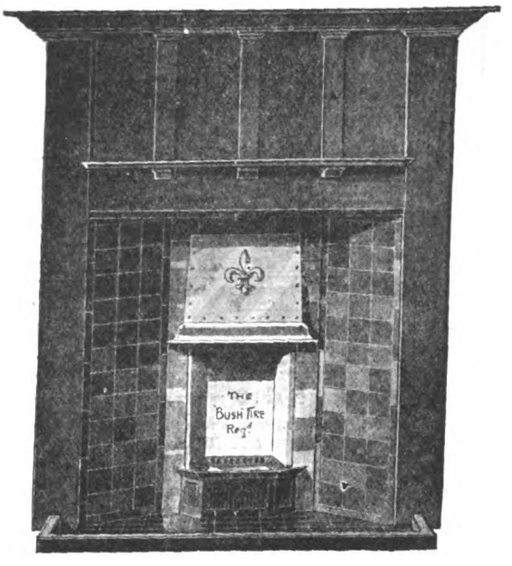
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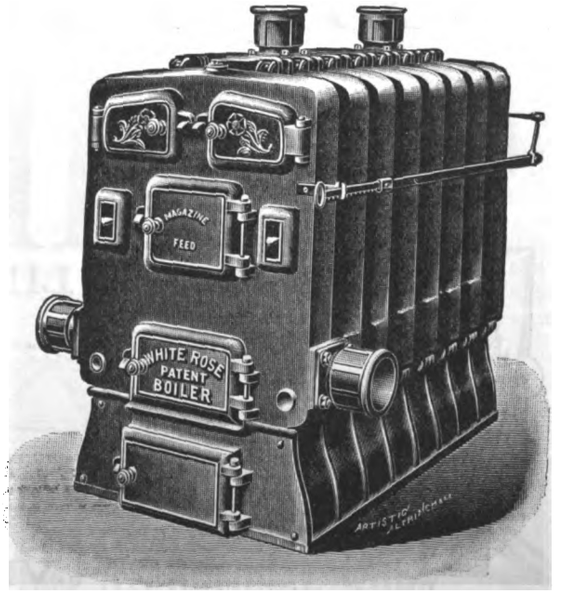
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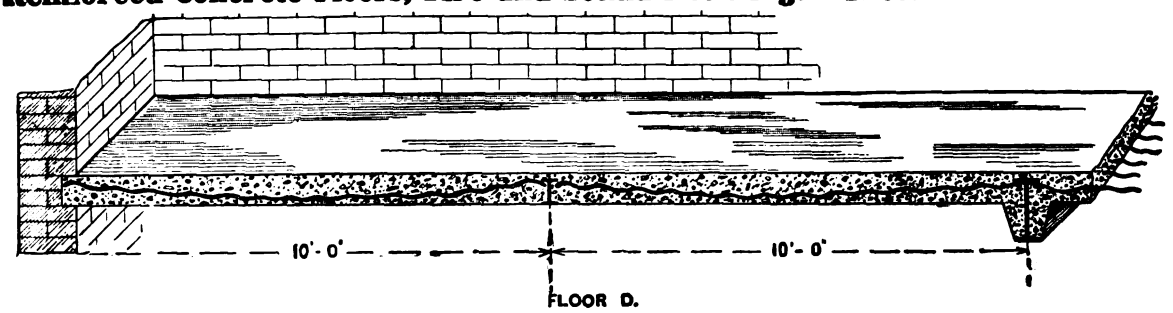
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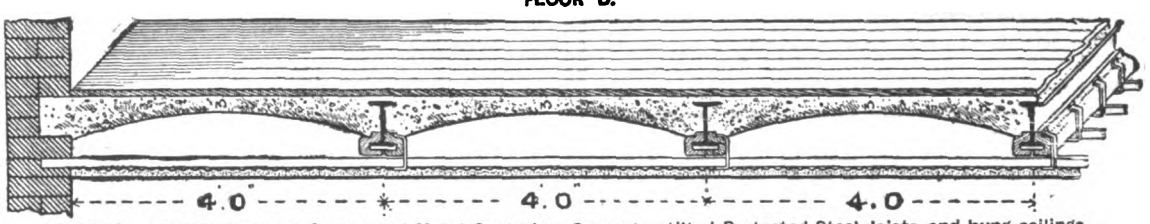
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Architect and Contract Reporter.

FRIDAY, JULY 30, 1909.

Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s 6d. All business communications to the Managing Director,

P. A. GILBERT WOOD,

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

*** *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

COMPETITIONS OPEN.

DEPTFORD.—Sept. 1.—The Metropolitan Borough Council of Deptford invite designs for a branch library at New Cross, S.E. Premiums of 50 guineas, 25 guineas and 10 guineas will be awarded. Assessor, Mr. J. S. Gibson, V.P.R.I.B.A. Deposit 1*l.* 1*s.* Competition is limited to architects practising in the city or county of London. Mr. Vivian Orchard, Town Clerk, Town Hall, New Cross Road, S.E.

FOREST HALL.—Aug. 30.—The Northumberland education committee invite designs from architects practising in Northumberland and Newcastle for an elementary school for 250 scholars. Mr. C. Williams, secretary, The Moothall, Newcastle-on-Tyne.

HUDDERSFIELD.—Aug. 31.—Plans are invited for a church to seat 400, to cost about 2,000*l.*, not to exceed 2,500*l.*, with all fittings, furnishings, lighting and heating apparatus. The Rev. D. Macrae Tod, B.D., St. James's Manse, Huddersfield.

HULL.—Oct. 11.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

NEWBURN.—Sept. 1.—The Newburn Urban District Council invite designs from architects practising in Newcastle-on-Tyne and Northumberland for new council chamber, offices and caretaker's house. The author of the best design will carry out the work; a premium of 10*l.* will be awarded



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to the second. Mr. R. J. Leeson (Messrs. Oliver, Leeson & Wood, architects), assessor. Deposit 1*l.* 1*s.* Mr. G. Wilkinson, clerk to the Council, Mosley Street, Newcastle-upon-Tyne.

WALES.—Oct. 1.—The Urban District Council of Aberdare invite competitive designs for a fever hospital for fifty-two patients, including administrative block, outbuildings, &c. Premiums of 100*l.*, 50*l.* and 25*l.* An assessor will be appointed on the nomination of the President of the R.I.B.A. Deposit 3*l.* 3*s.* Mr. T. Phillips, clerk, Town Hall, Aberdare.

CONTRACTS OPEN.

ALLONBY.—Aug. 7.—For the erection of cloak-rooms, &c., to Allonby Council school, Cumberland. The education committee's Clerk of Works, 13 Earl Street, Carlisle.

BAILIFFE BRIDGE.—Aug. 4.—For the mason, joiner, iron and steel work, plumber and glazier, slater, concretor, and patent glazier works required in additions to weaving shed at Victoria Works, Bailiffe Bridge, Yorks. Messrs. Joseph F. Walsh, F.S.I., & Graham Nicholas, F.R.I.B.A., architects, Museum Chambers, Halifax.

BELVEDERE (KENT).—Aug. 14.—For the erection of a porter's lodge at Erith Sanatorium, Little Heath, Belvedere, for the Erith Urban District Council. Deposit 1*l.* The Surveyor, Erith.

BICKERSTAFFE (LANCS.).—Aug. 9.—For the construction and erection of an engine and boiler-house, chimney, cottages and other buildings, near Royal Oak. Deposit 5*l.* 5*s.* Messrs. H. Rofe & Sons, civil engineers, 8 Victoria Street, Westminster, S.W., and Oxford Chambers, Victoria Square, Leeds.

BIRMINGHAM.—Aug. 24.—The Commissioners of His Majesty's Works and Public Buildings invite schemes and tenders based thereon for the reinforced concrete portions of the Birmingham Head Post Office. Any system or systems of construction may be adopted for the whole or any part of the work. Deposit 1*l.* 1*s.* Mr. J. Rutherford, the Board's architect, 17 Delahay Street, S.W.

BLYTH.—Aug. 6.—For alterations and additions at Custom House. H.M. Office of Works, Pink Lane, Newcastle-on-Tyne.

CASSOP COLLIERY.—Aug. 6.—For the several works required in alterations to the Black Bull Inn, Cassop Colliery, Durham. Mr. T. H. Murray, architect and surveyor, Consett.

CARLISLE.—Aug. 2.—For the ground formation, concrete raft and sub-floor for new roller skating rink; also for the whole of the works comprised in the superstructure (mainly timber framing, with Belfast roof). Send names to Messrs. Oliver & Dodgshun, architects, Carlisle.

CHATHAM.—Aug. 7.—For additions to Royal Sailors' Home. Deposit 1*l.* 1*s.* Mr. George E. Bond, architect, 384 High Street, Rochester.

CLITHEROE.—Aug. 2.—For alterations to Moor Lane premises, for the Clitheroe Co-operative Society. Mr. W. J. Povey, secretary, 2 Moore Lane, Clitheroe.

COVE AND HAWLEY (HANTS).—August 9.—For erection of a Council school for 140 children at Cove. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

DENTON.—Aug. 12.—For erection of a Council school, to accommodate 250 children, at Denton, near Gravesend, Kent. Send name and a deposit of 1*l.* by Aug. 3, to Mr. Fras. W. Crook, secretary, Caxton House, Westminster, S.W.

DULOE.—Aug. 7.—For erection of a farmhouse, farm buildings, and water supply at Blackdown, Duloe, near Liskeard, for the small holdings committee of the Cornwall County Council. Mr. S. G. Carnell, county land agent, Public Rooms, Truro.

ECCLES.—Aug. 21.—For erection of a secondary and technical school at Park Road, Monton. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

FILEY.—For erection of a Masonic Hall at Filey. Deposit 1*l.* Send names to Mr. Arthur Easton, architect, 7 Land-of-Green-Ginger, Hull.

GLASGOW.—Aug. 2.—For the following works in connection with buildings to be erected in Moore Street and Hill Street, viz.:—(1) Digger, mason and brick works; (2) joiner work; (3) iron and steel works; (4) plumber work; (5) slater work; (6) plaster and pavior works; (7) asphalte work; and

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HARTLEPOOL.—Aug. 4.—For erecting offices for dock master, and cabin for dock head men at Victoria Dock, for the North-Eastern Railway Company. The Station Master at Hartlepool, and Mr. William Bell, the company's architect, York.

HULL.—For erection of smokehouse, &c., in Eastbourne Street, for Messrs. Blazier & Carr. Mr. Ernest Whitlock, architect and surveyor, 26 Scale Lane, Hull.

HULL.—Aug. 4.—For erection of a waterguard station for H.M. Customs at Hull, for the North-Eastern Railway Company. The Station Master, Paragon Station, Hull, and Mr. William Bell, the company's architect, York.

HYTHE.—Aug. 4.—For the erection of a special subjects room at the Hythe Council school, Kent. Mr. Wilfrid H. Robinson, M.S.A., committee's architect, Caxton House, Westminster, S.W.

IRELAND.—Aug. 5.—For the erection of the new Holiday Home, near Bangor. Mr. W. C. Maxwell, architect, 13 Lombard Street, Belfast.

LONDON.—Aug. 19.—The Commissioners of H.M. Works and Public Buildings invite constructional schemes and tenders based thereon for erection in reinforced concrete of the new building for the Money Order Department of the Post Office at Manor Gardens, Holloway, N. Deposit 3*l.* 3*s.* Mr. J. Wager, A.R.I.B.A., M.C.I., at H.M. Office of Works, &c., Storey's Gate, S.W.

LOW MOORSLEY.—July 31.—For the building of premises at Low Moorsley, for the Low Moorsley Amicable Industrial Society, Ltd., Hetton-le-Hole, co. Durham.

LUTON.—Aug. 23.—For erection of an elementary school at Luton, Chatham. Deposit 2*l.* 2*s.* Send names by Aug. 3 to Mr. Herbert H. Dunstall, architect, Railway Street, Chatham.

MAIDENHEAD.—July 31.—For additions to the Electric Light Central Station. Deposit 1*l.* 1*s.* Mr. Percy Johns, borough surveyor, Guildhall, Maidenhead.

MARYPORT.—July 31.—For alterations to the Central Stores, Maryport, Cumberland. Forward names to Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

MOOR ROW.—July 31.—For erection of a pair of semi-detached cottages at Moor Row, Cumberland. Send names to Mr. J. S. Stout, architect and surveyor, 36 Lowther Street, Whitehaven.

NEWCASTLE-UPON-TYNE.—Aug. 10.—For extensions to Rutherford College. Deposit 2*l.* 2*s.* Mr. A. C. Coffin, Education Offices, Northumberland Road, Newcastle-upon-Tyne.

OLD TRAFFORD.—Aug. 4.—For erection of an infant school at Old Trafford, Manchester, for the Stretford education committee. Mr. Ernest Woodhouse, F.R.I.B.A., 88 Mosley Street, Manchester.

PLYMOUTH.—Aug. 2.—For the completion of platform coverings at Plymouth (North Road) Station, the steelwork for which is already fixed, for the Great Western Railway Company. The Engineer at Plymouth (North Road) Station.

PRESTON.—Aug. 21.—For taking down the existing buildings between the County Council offices in Fishergate Hill and the Constabulary Offices in Jordan Street, and erecting new offices on the site. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

SHEFFIELD.—Aug. 5.—For the following work required in erection of Central Tramways Depot at Shoreham Street and Leadmill Road:—(1) General building work, (2) structural steelwork. The City Architect, Town Hall, Sheffield.

SHEFFIELD.—Aug. 10.—For erection of the Training College Hall of Residence for Men, and also for the heating and the electric lighting of same. Messrs. Gibbs & Flockton, architects, 15 St. James Row, Sheffield.

SOUTH BANK (YORKS).—July 31.—For the whole of the work in connection with alterations and improvements at the Princess Street Council schools, South Bank, North Riding. Send names to Mr. J. C. Wrigley, secretary, County Hall, Northallerton.

STAINCLIFFE.—Aug. 7.—For six houses at Staincliffe, Yorks. Messrs. John Barton & Son, architects and surveyors, Halifax Road, Dewsbury.

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SWADLINCOTE.—Aug. 3.—For erection of a fire hose station, stores, and public urinal in High Street, Newhall. Mr. A. J. Mason, town engineer and surveyor, Council Offices, Swadlincote.

TIVERTON.—July 31.—For certain additions and alterations to old house, Blundell's School. Deposit 2*l.* 2*s.* Messrs. A. P. I. Cotterell & Carr, architects, 28 Baldwin Street, Bristol.

TORPOINT.—July 31.—For erecting Council schools. Mr. B. C. Andrew, architect to the Cornwall education committee, Biddick's Court, St. Austell.

TROWBRIDGE.—Aug. 10.—For erection of a weights and measures office, in Hill Street. Mr. J. George Powell, county surveyor, County Offices, Trowbridge, Wilts.

TRURO.—July 31.—For alterations and improvements to the Mevagissey Council girls' school, Cornwall. Mr. B. C. Andrew, architect to the committee, Biddick's Court, St. Austell.

UXBRIDGE.—Aug. 9.—For additional lavatory accommodation in the aged men and women's quarters at the workhouse. Mr. W. L. Eves, surveyor, 54 High Street, Uxbridge.

WAKEFIELD.—Aug. 6.—The West Riding education committee invite whole or separate tenders for the following, viz.:—Rawmarsh, Ryecroft new school; Shitlington, Netherton new school; Barnoldswick, Rainhall Road provided school, alterations, &c. (Builder, joiner, plasterer, plumber, slater, painter.) Deposit 1*l.* each. The West Riding Architect, County Hall, Wakefield.

WALES.—Aug. 2.—For erection of a goods shed at Risca, Monmouthshire, for the Great Western Railway Co. The Engineer at Newport Station.

WALES.—Aug. 5.—For erection of eighteen houses at Penyrheol, near Caerphilly, for the Bargoed and Abertridwr Building Club No. 2. Mr. P. Vivian Jones, P.A.S.I., architect and surveyor, Hengoed.

WALES.—Aug. 5.—For alterations and renovation of Albion Hotel, Aberaman, Aberdare. Mr. William Dowdeswell, architect, Treharris.

WALES.—Aug. 6.—For erection of higher elementary schools, with cookery centre, laundry and caretaker's house, at Stow Hill, Newport, Mon. Deposit 3*l.* 3*s.* The Architect, Town Hall, Newport.

WALES.—Aug. 7.—For extensions and alterations to the Abergavenny Girls' Secondary school. Deposit 2*l.* 2*s.* Mr. E. A. Johnson, architect, Abergavenny. Also for extensions and alterations to the Abertillery County Secondary school. Deposit 2*l.* 2*s.* Mr. R. L. Roberts, architect, Abercarn.

WALES.—Aug. 9.—For erection of a steward's dwelling house adjoining the club premises and for the construction of additions and alterations to the present Constitutional Club, Caerau, near Bridgend. Deposit 1*l.* 1*s.* Mr. J. R. Snape, solicitor, 3 Talbot Street, Maesteg.

WALES.—Aug. 9.—For erection of five pairs of semi-detached cottages at Merthyr Vale, for the Merthyr Vale Building Club. Mr. William Dowdeswell, architect, Treharris.

WALES.—Aug. 13.—For erection of a cottage hospital and appurtenances to be erected at Nantyglo, Mon. Mr. James Pitman, secretary, Cwmcelyn, Blaina, Mon.

WALES.—Aug. 12.—For erection of a church at Bedlinog. Deposit 1*l.* 1*s.* Mr. William Dowdeswell, architect, Treharris.

WALNEY (BARROW-IN-FURNESS).—Aug. 9.—For erection of a waiting-room and convenience on the Promenade. The Borough Engineer's Office.

WILLINGTON (DURHAM).—Aug. 6.—For the several works required in alterations to the Blue Bell Inn, Willington, Durham. Mr. T. H. Murray, architect and surveyor, Consett.

WORKSOP.—Aug. 4.—For the construction of an open-air swimming bath in Prior Well Road. Deposit 1*l.* 1*s.* Mr. G. Rawson, surveyor, Town Hall, Worksop.

MR. W. T. HALL, surveyor, of Shrewsbury, has been appointed as adviser to the small holdings committee of the Shropshire County Council at a salary of 400*l.* per annum, with 150*l.* for clerical expenses and 100*l.* for travelling. Some of the members regarded the salary as excessive, as Mr. Hall was not prepared to undertake to give up the whole of his time to the work of the Council, and for other reasons. Ultimately it was decided to ratify the arrangement for twelve months.

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TENDERS.

BARNET.

For new County Council school, for Hertfordshire County Council. Mr. H. A. SMITH, county surveyor, Hatfield.

Nightingale	£7,946 0 0
Miskin & Son	7,323 0 0
Guttridge & Son	7,268 0 0
Honour & Son	7,173 16 8
Gibson & Son	6,747 0 0
Thomas & Edge	6,594 0 0
Hitch	6,562 0 0
Henson & Son	6,546 15 8
Hacksley Bros.	6,522 0 0
Wallis	6,450 0 0
Lawrence & Son	6,446 0 0
Paul	6,395 0 0
Hunt & Son	6,391 0 0
Bosworth & Lowe	6,353 7 2
Jaggard	6,300 0 0
Higgs	6,196 0 0
PARREN & SON, Earith, Hunts (*accepted*)	5,993 0 0

BIGGLESWADE.

For the erection of Church of England schools for girls and infants at Biggleswade, Beds., for the Foundation Managers. Mr. THOMAS COCKRILL, A.M.Inst.C.E., architect, Market Square, Biggleswade. Quantities by Mr. HENRY BUSHELL, F.S.I., 33 New Bridge Street, E.C.

Raban & Sons	£4,138 7 6
Henman & Son	4,128 11 1
Shrouder & Matthews	4,092 8 5
Haynes	3,997 8 8
Newton	3,874 0 0
Coulson & Lofts	3,817 0 0
Wade	3,799 9 6
Welham	3,753 1 7
Negus & Sons	3,739 12 5
Page & Son	3,687 5 0
Wright	3,663 0 0
Hinkins	3,588 11 0
Clarke & Sons	3,563 12 11
Redhouse & Son	3,540 11 0
Higgs	3,512 14 11
Bartle & Son	3,499 7 8
Bailey & Co.	3,498 0 0
Treasure Bros.	3,475 0 0
Beardmore & West	3,391 3 6

BIGGLESWADE—*continued.*

BURGHILL.

For additions to the Council school at Burghill, near Hereford.

Friend	£1,088 10 0
Hiles	988 0 0
Cooke	984 0 0
Beavan & Hodges	965 0 0
Powell	956 0 0
Bowers	940 0 0
WILKS, Hereford (*accepted*)	889 10 0

COLESHILL, NEAR BIRMINGHAM.

For additional wing, containing laundry, chapel and babies' rooms, for the Rev. G. V. Hudson. Mr. HENRY T. SANDY, architect, Stafford. Quantities by architect.

Rowbotham	£3,199 0 0
Whittall & Son	3,189 0 0
Sapcote & Sons	3,157 0 0
Williams	3,148 0 0
Gibbs	3,077 0 0
Bishop	3,065 0 0
Fenwick	3,050 0 0
Smith & Sons	2,975 0 0
Elvins	2,890 0 0
Webb	2,888 0 0
T. & S. Ham	2,855 0 0
Moss & Sons	2,834 0 0
Hopkins	2,800 0 0
Loud & Sons	2,799 0 0
Barnsley & Sons	2,766 0 0
BOWEN & SONS (*accepted*)	2,759 0 0

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DURHAM.

For the construction of a new outfall sewer and sewage-disposal works at Bearpark, for the Durham Rural District Council. Mr. GREGSON, surveyor.

MacLaren	£2,250 0 0
Edwards	1,925 6 6
Woods & Adams	1,895 0 0
McKay & Sons	1,820 1 3
Walton Bros.	1,750 0 0
Meredith	1,650 2 2
Henderson	1,534 16 8
CARRICK, Durham (*accepted*)	1,533 11 9

ENFIELD.

For heating apparatus for the addition to Southbury Road Schools.

Wilmer & Son	£267 12 6
Wontner, Smith, Gray & Co.	246 6 0
Knight	234 2 0
CLARK, HUNT & Co. (*accepted*)	221 10 6

GILLINGHAM.

For extending (A) Byron Road and (B) Richmond Road Council schools. Mr. J. L. REDFERN, A.R.I.B.A., borough surveyor, Gillingham, Kent.

	A	B
Phillips	£1,950 0 0	£920 0 0
West Bros.	1,775 0 0	789 0 0
F. & G. Foster	1,683 0 0	827 0 0
Baker & Son	1,599 0 0	689 0 0
GATES & SONS, Strood (*accepted*)	1,535 0 0	689 0 0
Seager	1,419 0 0	653 0 0

HELSBY.

For alterations and additions to house and business premises, Helsby, Cheshire, for Mr. Arthur Priestner. Mr. SAMUEL DAVIES, M.S.A., architect, Frodsham.

R. Gleave & Son	£920 0 0
G. Gleave	889 0 0
Littler	887 0 0
J. G. Davies	815 0 0
H. DAVIES, Helsby (*accepted*)	785 0 0

HANDSWORTH (STAFFS.).

For erection of a chapel and entrance lodge at the cemetery at the Leveretts.

W. & J. Webb	£7,721 0 0
Sapcote & Sons	7,625 0 0
Dallow & Sons	7,265 0 0
Briley	7,042 0 0
Willcock & Co.	6,956 0 0
Johnson	6,930 0 0
Bowen & Sons	6,733 0 0
Lee & Sons	6,549 0 0
Rowbotham	6,451 0 0
Jones	6,409 0 0
Barnsley & Sons	6,248 0 0
Smith	6,230 0 0
Gibbs	6,100 0 0
BISHOP, King's Heath (*accepted*)	5,999 0 0

KIVETON PARK.

For Anston sewerage works, for the Kiveton Rural District Council, near Sheffield. Messrs. BERRINGTON, SON & WATNEY, engineers, Wolverhampton.

Barry	£4,690 0 0
Southorn & Co.	4,474 10 11
Castle & Co.	4,239 18 0
Lane Bros.	3,869 9 0
Crawford	3,800 0 0
Waring & Sons	3,650 0 0
Cottle & Co.	3,627 18 2
Bower Bros.	3,569 0 0
MacDonald	3,557 0 0
BOSWELL, Wolverhampton (*accepted*)	3,381 12 11
Engineer's estimate	3,578 12 0

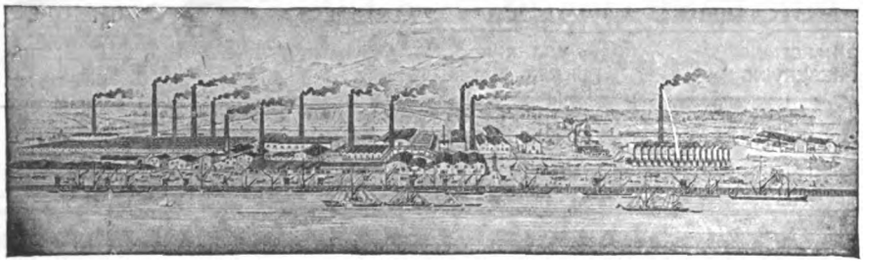
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Bell Bros.	£350 0 0
Candy Filter Co.	337 10 0
Mather & Platt	212 0 0
Pulsometer Engineering Co.	200 0 0

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LONDON—*continued.*

Tenders recommended for heating work at various schools, for the London County Council education committee.

Halford Road, Fulham.

Wenham & Waters, Ltd., Croydon	£237 0 0

Upper Hornsey Road, Islington.

Kite & Co., Euston Road	335 0 0

Vittoria Place, Islington.

Comyn Ching & Co., Castle Street, Long Acre	155 15 0

Buckingham Street, Islington.

Norden, Hampton Road, Forest Gate	97 10 0

Holbeach Road, Lewisham.

Brightside Foundry and Engineering Co.	207 0 0

Trafalgar Square, Stepney.

Yetton & Co.	76 15 0

For the erection of a secondary school for 456 girls on the Furzedown site, Wandsworth, for the L.C.C.

F. & H. F. Higgs	£36,034 0 0
Downs	35,723 0 0
Lovatt	35,281 0 0
Smith & Sons	35,180 0 0
Leslie & Co.	34,976 0 0
Wallis & Sons	34,769 0 0
Wall	34,665 9 8
Carmichael	34,236 0 0
Johnson & Co.	34,083 0 0
Spencer, Santo & Co.	33,884 0 0
Holliday & Greenwood (*recommended*)	33,577 0 0
J. & C. Bowyer	33,575 0 0
J. & M. Patrick (*withdrawn*)	28,700 0 0
Estimate of the architect (education)	32,961 0 0

The contractors submitted alternative estimates providing for the use of Portland stone, terra-cotta and artificial stone for doorways, dressings, &c., the prices set out above being for Portland stone, and the committee are of opinion that a tender calculated on the use of terra-cotta should be accepted.

LONDON—*continued.*

For cleansing various wards, &c., at the infirmary, High Street, Homerton, N.E., for the Hackney Union.

Roome & Co.	£403 0 0
Silk & Son	397 0 0
Holland & Co.	364 0 0
King & Barker	352 0 0
Castle & Son	350 0 0
Bishop	279 0 0
Finch & Co.	274 0 0
Keetch	256 0 0
Lister & Co.	250 0 0
Barker	239 0 0
Whitaker & Son	213 0 0
Hough	195 0 0
Rowley (*recommended*)	178 0 0
Matthews	175 0 0

For painting and repairs at the workhouse, Parish Street, S.E., for the Guardians of the Poor of the parish of Bermondsey. Mr. ARTHUR H. NEWMAN, F.R.I.B.A., architect to the Board, 31 Tooley Street, London Bridge, S.E.

Dyke	£250 0 0
F. & F. H. Higgs	181 0 0
Welch	176 12 5
Vigor & Co.	152 0 0
Nightingale	144 0 0
Holloway	140 0 0
Minter	140 0 0
Nash	133 0 0
Greenwood	131 0 0
REASON (*accepted*)	115 10 0

For the erection of conveniences at Avery Hill and the formation of a path thereto.

Maxwell Bros.	£854 0 0
A. & F. Polden	627 0 0
Lowe & Co.	591 0 0
Line	533 0 0
F. & G. Foster	514 0 0
Barker & Co. (*recommended*)	439 0 0
Estimate	460 0 0



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LONDON—*continued.*

For the erection of a manual training centre for twenty boys in connection with the Cubitt Town school, Poplar, for the L.C.C.

Kazak	£982 13 9
F. & E. Davey	913 6 5
Friday & Ling	859 6 0
Kirk & Randall	843 0 0
Vigor & Co.	822 15 0
Griggs & Son	804 11 7
Akers & Co.	787 0 0
Thomas & Edge	777 0 0
F. & T. Thorne	768 3 8
Newell & Lusty (*recommended*)	767 13 8
Estimate of the architect (education)	796 0 0

For the erection on the Millwall site, Poplar, of a domestic economy centre and a metalwork centre with science room, for the L.C.C.

Holloway	£4,639 0 0
Parker & Sons	4,614 0 0
Perry & Co. (Bow)	4,597 0 0
Chessum & Sons	4,445 9 7
Harris	4,224 0 0
F. & T. Thorne	4,133 0 0
Leng	4,110 0 0
J. & C. Bowyer	4,107 0 0
F. & E. Davey (*recommended*)	4,054 19 4
Estimate of the architect (education)	4,250 0 0

For the adaptation of vacant rooms in the mansion at Marble Hill to provide convenience and dressing accommodation.

Lawrence	£698 0 0
Creek & Co.	672 6 0
Jennings	545 0 0
Newell & Lusty	473 0 0
Smith	468 0 0
Speechley & Smith	460 0 0
Davies & Sons	444 0 0
Hidden	441 0 0
Jarman & Co.	436 0 0
Rice & Sons (*recommended*)	395 0 0
Estimate	395 0 0

LONDON—*continued.*

For the erection on the Camden Street site, St. Pancras, of a higher school for the accommodation of 440 children, for the L.C.C.

Downs	£14,796 0 0
Hawkins & Co.	14,037 0 0
Grover & Son	13,951 0 0
Perry & Co. (Bow)	13,848 0 0
Treasure & Son	13,829 0 0
Davies	13,655 0 0
J. & M. Patrick	13,594 0 0
Wallis & Sons	13,567 0 0
Johnson & Co.	13,542 0 0
Godson & Sons	13,453 0 0
Patman & Fotheringham	13,451 0 0
J. & C. Bowyer	12,983 0 0
Lawrence & Son	12,931 0 0
McLaughlin & Harvey	12,531 12 0
Estimate of the architect (education)	13,437 0 0

For the enlargement of the Queen's Head Street school, Islington, by 249 places, for the L.C.C.

Symes	£9,656 0 0
Treasure & Son	9,468 0 0
Patman & Fotheringham	9,446 0 0
Chessum & Sons	9,301 0 0
L. H. & R. Roberts	9,257 0 0
J. & C. Bowyer	9,195 0 0
Leng	9,180 0 0
Kirk & Randall	9,150 0 0
Godson & Sons	9,070 0 0
Price	9,062 0 0
Triggs	9,000 0 0
C. P. Roberts & Co.	8,946 0 0
McLaughlin & Harvey (*recommended*)	8,573 17 9
Estimate of the architect (education)	9,290 0 0

For two underground conveniences in Horseferry Branch Road, by Commercial Road East, Ratcliff, E., for Stepney Borough Council. Mr. M. W. JAMESON, A.M.Inst.C.E., borough engineer, Great Alie Street.

Jennings	£1,960 0 0
Thomas & Edge	1,621 0 0

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ILLUSTRATIONS.

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BIRMINGHAM UNIVERSITY.—GENERAL VIEW FROM REAR—THE GREAT HALL—ENTRANCE HALL—INTERIOR OF GREAT HALL.

BRANCH LIBRARY, HENDON, SUNDERLAND.

LONDON—*continued.*

Symes	1,553	0	0
Barker	1,539	0	0
Harris & Wardrop	1,526	0	0
Roome & Co.	1,523	0	0
Spencer, Santo & Co.	1,508	0	0
F. & G. Foster	1,476	0	0
F. & T. Thorne	1,463	0	0
NIGHTINGALE (*accepted*)	1,410	0	0

For painting and repairs at the Bermondsey Infirmary, for the Guardians of the Poor of the parish of Bermondsey. Quantities by Messrs. FARTHING & SON, of 46 Strand, W.C. Mr. ARTHUR H. NEWMAN, F.R.I.B.A., architect to the Board, 31 Tooley Street, London Bridge, S.E.

Wright	£4,878	0	0
Renwick	3,930	0	0
Holloway	3,774	0	0
Harris & Wardrop	3,500	0	0
F. & F. H. Higgs	3,497	0	0
Nash	3,463	0	0
Greenwood	3,287	0	0
Hocking	3,236	0	0
Vigor & Co.	3,156	0	0
Reason	2,897	0	0
McCarthy	2,407	0	0
NIGHTINGALE (*accepted*)	2,393	0	0

MAGHULL, NEAR LIVERPOOL.

For the erection of the Maghull Parish Institute. Messrs. CUDDY & BALL, architects, 20 Hackins Hey, Liverpool.

Harding	£1,439	0	0
Riding & Sons	1,319	0	0
Whittle	1,298	0	0
Woods, Benson & Co.	1,292	0	0
Anderton & Ball	1,289	0	0
Roberts & Thomas	1,279	0	0
Spencer	1,193	0	0
Hall & Jamieson	1,184	0	0
Johnson & Sons	1,181	0	0
KELLY & BRO., Liverpool (*accepted*)	1,167	0	0

MANSFIELD.

For sewage disposal works between Bath Lane and Old Mill Lane. Messrs. VALLANCE & WESTWICK, engineers, Mansfield. Quantities by the engineers.

MACKAY, Derby (*accepted*)	£26,728	0	0

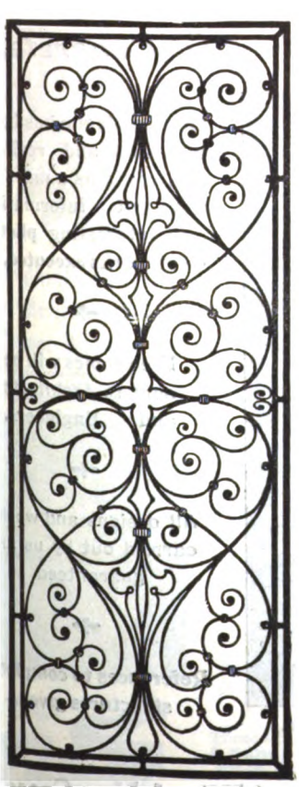
NEW SOUTHGATE.

For the erection of Christ Church (Congregational). Messrs. G. BAINES & SON, architects, 5 Clement's Inn, Strand, W.C.

Wilton	£5,379	0	0
Dove Bros.	5,293	0	0
Patman & Fotheringham	5,110	0	0
Lawrence & Son	5,100	0	0
Mattock Bros.	5,077	0	0
Knight & Son	5,077	0	0
Brightman & Son	4,991	0	0
Musselwhite & Sapp	4,982	0	0
Battley, Sons & Holness	4,859	0	0
Minter	4,650	0	0
Dudley	4,624	17	6
Allen & Sons	4,600	0	0
Jerram *	4,555	0	0

* Provisionally accepted, with subsidiary estimates making a total of 4,597*l.*

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NORTHAMPTON.

For erecting a town and county school, Billing Road. Messrs. NORMAN & MCKEWAN, architects, Northampton.

H. Green	£12,368 0 0
Cosford	12,199 0 0
Hacksley Bros.	12,179 0 0
Martin & Co.	11,848 0 0
Archer & Co.	11,758 0 0
Henson	11,735 0 0
Clarke	11,690 0 0
E. Green	11,648 0 0
Heap	11,639 0 0
Sharman & Son	11,440 0 0
Hickman	11,200 0 0
Higgs	10,949 0 0
HAWTIN, Northampton (*accepted*)	10,679 0 0

RHOS-ON-SEA.

For erecting (A) new Congregational schools and (B) caretaker's house. Messrs. J. M. PORTER & ELCOCK, architects, Colwin Bay.

	A	B
Davies & Collins	£1,417 12 0	£422 6 0
T. Jones	1,390 0 0	400 0 0
Roberts Bros.	1,331 10 0	446 5 7
Tucker & Sons	1,311 0 0	346 2 0
Bond & Sons	1,285 14 7	348 10 11
Jones & Pritchard	1,281 0 0	397 0 0
L. Jones	1,230 0 0	366 0 0
Jones & Hughes	1,130 0 0	390 0 0
J. O. Davies	1,115 0 0	326 0 0
WILLIAMS, Rhos-on-Sea (*accepted*)	1,057 19 5	266 10 0

SCOTLAND.

For providing and delivering about 975 tons of cast-iron pipes 9 inches diameter, and the relative special castings in connection therewith, for the Lanark Town Council. Mr. M. RATCLIFFE BARNETT, C.E., Glasgow.

Holwell Iron Co.	£5,845 13 11
Stanton Ironworks Co.	5,651 4 11
Cochrane & Co.	5,579 4 8
Macfarlane, Strang & Co.	5,557 0 4
Stewart & Co.	5,536 18 0
MACLAREN & Co., Glasgow (*accepted*)	5,493 13 0

SCOTLAND—*continued.*

For making a new road from Portree to Eastside, Kilmuir, about 12½ miles, including ten bridges. Mr. J. MACKENZIE, Portree Road, surveyor.

Roadway.

Macdonald	£11,667 17 0
Macvinish	8,338 0 0
Matheson & Co.	8,324 5 2
Fraser	7,385 0 0
Dobson	7,009 8 0
Taylor & Macdonald	6,700 0 0
Macrae	5,110 0 0
Campbell & Macaskill	5,037 12 0
Macintyre & Turnbull	4,269 17 0
D. Nicolson & Co.	4,231 6 8
Maclean & Co.	4,128 13 4
Bruce & Co.	4,115 12 4
R. Nicolson & Co.	4,065 6 8
Blair	3,998 2 6
Eslen	3,829 13 0
CARMICHAEL, Lochgilphead (*accepted*)	3,755 0 0

Steel for bridges.

Speirs & Co.	303 17 0
Rosestree Foundry	208 15 0
A. & J. Main & Co.	160 10 0
P. & W. MACLELLAN, Glasgow (*accepted*)	149 17 6

SOUTHAMPTON.

For a maple-wood floor for the Royal Pier Pavilion, for the Harbour Board. Mr. E. COOPER POOLE, A.M.I.C.E., engineer.

Permanent floor.

Acme Flooring and Paving Co.	£183 12 0
Woodhouse & Co.	180 0 0
Wilson	160 0 0
Complete Wood Flooring Co.	155 5 0
Dyer & Sons	134 10 0
Geary & Co.	127 0 0
Grace	117 10 0
NICHOL, Bitterne, Southampton (*accepted*)	97 15 0

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Complete Wood Flooring Co.	171 13 4
Dyer & Sons	162 0 0
NICHOL, Bitterne, Southampton (*accepted*)	130 0 0

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TROWBRIDGE.

For internal and external renovations to the County Offices, Trowbridge, Wilts. Mr. J. G. POWELL, county surveyor.

Pratt & Co.	£353 18 7
Parnell & Sons	349 17 0
Coates	311 3 10
Robbins	235 14 4
Linzey	221 14 9
Beavan & Son	218 18 3
Preece	190 16 0
Moore & Sons, Trowbridge (*recommended*)	187 6 5

WORCESTER.

For St. Martin's new church, Worcester. Mr. GEO. H. FELLOWES PRYNNE, F.R.I.B.A., architect, 6 Queen Anne's Gate, Westminster. Quantities by Mr. R. HENRY HALE, F.S.I., 6 Queen Anne's Gate, Westminster.

	Stone outside and brick inside facings.	Less brick outside.
Cornish & Gaymer	£12,023 0 0	£427 0 0
Collins & Godfrey	10,880 0 0	459 0 0
Dallow & Sons	10,825 0 0	468 0 0
Foster & Dicksee	10,675 0 0	385 0 0
Franklin	10,384 0 0	501 0 0
Sapcote & Sons	10,200 0 0	390 0 0
Goddard & Sons	10,180 0 0	1,050 0 0
Parnell & Sons	10,069 18 8	279 0 0
Wood & Sons	9,710 0 0	405 13 10
Fairhead & Sons	9,693 0 0	456 0 0
Bowman & Sons	9,627 0 5	578 2 0
Bowers & Sons	9,609 10 5	321 15 4
Jarvis & Sons	9,488 0 0	370 0 0
Wilkins & Sons	9,426 8 6	372 13 7
Walden & Cox	9,083 0 3	691 10 4
J. & A. BRAZIER, Bromsgrove (*accepted*)	8,868 9 6	449 9 7

TRADE NOTES.

OUR attention has been called to the paragraph that appeared in our issue of July 2, relative to the surface-colouring of the walls of the new Victoria and Albert Museum. We understand that we were wrongly informed that the material of the Rapidal Paint Company was used on the walls of the new buildings, although they have supplied several tons to the museum, but that the well-known "Duresco" was specified by the architect, Sir Aston Webb, R.A., supplied by The Silicate Paint Company, of Charlton, S.E., and used on practically the whole of the interior wall surface of the new portion of the Victoria and Albert Museum.

MESSRS. E. H. SHORLAND & BROTHER, warming and ventilating engineers, Manchester, inform us that they are carrying out the following works:—The extensions to Sir Titus Salt's Hospital, near Bradford, are being warmed and ventilated by means of their patent Manchester grates; the extensions to the General Hospital, Cheltenham, are being warmed and ventilated by double-fronted patent Manchester stoves with descending smoke flues, exhaust roof ventilators and patent hygienic inlet ventilating panels; and the new Golf Club, Irvine, N.B., is being warmed and ventilated by means of Manchester stoves with descending smoke flues.

MESSRS. THOMAS LAWRENCE & SONS, Bracknell, supplied the facing bricks for the Orthopædic Hospital, Great Portland Street, W., which was opened by the King on Friday, the 23rd inst. Mr. Rowland Plumbe, F.R.I.B.A., the architect, specified medium and dark cherry-red hand-made facings. Messrs. Lawrence also supplied the whole of the facing bricks for the Pelham schools at Wimbledon (Mr. Burke Downing, F.R.I.B.A., architect), which have been illustrated in our two previous issues.

SOME interesting discoveries have been made in the course of the repairs being carried out at the Old Guildhall in Priory Park, Chichester. The removal of the plaster at the eastern end of this thirteenth-century building has displayed the whole plan of the east window, and three arcaded recesses a few feet above the floor-line have also been freed from the plaster. These recesses are unusual in both position and depth; possibly they were in a retro-choir and used for the preservation of relics. On the north side a beautiful trefoil-headed niche has come to light, which was possibly intended for an image of the Blessed Virgin, though it might have been an aumbry.

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VARIETIES.

CROYDON Town Council has decided to apply to the Local Government Board for sanction to borrow 14,000*l.* for the purchase of a site at Russell Hill for the construction of a low-level reservoir and other works connected therewith.

THE Bath Town Council were informed on Tuesday that in the proposed alterations at the Grand Pump Room, Bath Street, respecting which there has been so much controversy, is not to be touched.

IN June of last year the parish church of Melrose, which had been erected in 1810, was almost completely destroyed by fire. The heritors at once set about making arrangements for the erection of a new church on the site occupied by the former church. Messrs. Peddie & Washington Brown prepared the plans, and estimates have now been accepted for the work.

THE education committee of the London County Council propose that instruction in wrought-iron work for buildings shall be given in one of the Council's technical institutes. As the subject has not been taught previously, the approval of the Council is necessary.

THE Manchester waterworks committee have resolved, subject to confirmation by the City Council, to let the contract for the third, or northerly, portion of the third line of pipes to convey water from Thirlmere to Manchester to Messrs. Morrison & Mason, contractors, Glasgow. At the same meeting it was reported that there was a supply of water in hand sufficient for 114 days' consumption, based upon a daily average of 41,000,000 gallons.

A CIVIL Service supplementary estimate of 467,401*l.* required to be voted for the year ending March 31, 1910, was issued on Tuesday as a Parliamentary Paper [232]. The following are the principal items:—The sum of 5,850*l.* is required for Menai Bridge. It is explained that this bridge is vested in the Commissioner of Works, but the net receipts from tolls after paying maintenance charges are carried to the credit of the Local Loan Fund. Extensive repairs have, however, now become necessary, the cost of which cannot be met from current receipts. Mr. Churchill's Labour Exchanges Bill entails an item of 70,000*l.* for buildings, 19,000*l.* for salaries, 6,000*l.* for travelling and incidental expenses, and 9,339*l.* for salaries and travelling expenses of additional staff in the Office of Works in connection with the provision of buildings. Expenses in connection with International Exhibitions at Brussels, Rome, and Turin require 60,000*l.*

AT the meeting of the West Riding education committee at Wakefield on Tuesday the elementary education sub-committee stated that they had accepted tenders for new schools as follows:—

School.	Amount.	Accommodation.	Estimate approved.
Featherstone	£3,836 18 10	360	£4,320 0 0
Kirkburton	3,870 10 7	250	3,667 0 0
Knottingley	5,622 2 0	510	6,659 10 0

It was also proposed that new elementary schools should be provided as follows:—Addingham (3,250*l.*), Scholes, Birdsedge (2,600*l.*), Gomersal (5,040*l.*), Horsforth (7,550*l.*).

A DEMONSTRATION was given at the Temple Pier Embankment, London, on Monday, of the porhydrometer, an instrument invented by Signor de Lorenzi for weighing with the utmost accuracy the dead weight placed on board or removed from any ship, barge or other floating vessel. As with many other inventions, the spectator is struck by its simplicity. The instrument is based upon the infallible principle that a body floating in a liquid of whatever density displaces a quantity of that liquid exactly equal to its own weight, and by its application the vessel is transformed into a gigantic weighbridge or weighing machine. In the centre of the vessel a vertical tube is placed connected by a pipe with the water underneath; inside this tube is the aerometer (a vertical float), which is affected by the rise or fall of the liquid according as the displacement of the vessel is altered. The float is connected by a lever to a steelyard on which the exact change of weight is recorded. At the demonstration on an empty iron barge the weight of anyone stepping on board anywhere was recorded on the steelyard. The general opinion expressed was one of great enthusiasm at the benefits likely to accrue to those connected with all kinds of shipping from the new invention.

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"GESSOLIT" (temple) .	
"G T Z" . . .	C. M. Goebel & Söhnne, Grossalmerode.
"SEKURITAS" . .	D. J. Ch. Lebert, à Düsseldorf, Kronprinzenstr. 83.
"FURNALITH" . .	Ernst Otto Kupfer, Glauchau, Leopoldstrasse, 6.
"HERSBRUCKER" .	O. E. Wetzer, à Hersbruck.

SWEDEN.

TRADE MARK PUBLISHED IN JUNE AND JULY 1909.

Construction.

"HERKULES" . .	Takpapp- & Asfaltfabriken Helsingborg Evers & Co. firma Hälsingborg.

THE INSTITUTION OF MUNICIPAL ENGINEERS.

A WELL-ATTENDED and most successful South-Eastern District meeting of the Institution of Municipal Engineers was held on Saturday, the 24th inst., at Ruislip, Mr. Henry C. Adams, A.M.I.C.E., A.M.I.M.E., A.M.I.E.E., District Chairman and Member of Council of the Institution, presiding. Councillor F. M. Elgood, F.R.I.B.A., F.S.I., chairman of the public health committee, offered a cordial welcome on behalf of the urban district council to the members, and in thanking him on behalf of the Institution, Mr. Henry C. Adams referred to the fact that although they were a new body, having been instituted only some fifteen months, they had received practically 1,000 applications for membership. Their ranks were open to all competent men engaged in municipal work, whether as electrical, gas, mechanical, or waterworks engineers, together with those who, like himself, had passed through the mill of official municipal appointments, and having reached the haven of private practice, were engaged in municipal work in a consulting capacity. They were affiliated to the National Association of Local Government Officers with a membership of 15,000; and the questions of security of tenure and superannuation were receiving the attention of the Council. Their technical library, which was being formed, contained many valuable books, and would be of the greatest service to the members whether residing in the provinces or in London; the proposed method of working it could be best summed up in the words "You send a postcard, we do the rest," as any book in the library would be sent on loan at the request of any member without any charge whatever.

Mr. W. Louis Carr, surveyor to the Council, read a paper on "The Sewerage and Sewage Disposal Works of the Ruislip-Northwood Urban District Council," and Dr. L. W. Hignett, M.B., C.M.Edin., D.P.H.Camb., medical officer of health, read a paper on "The Principles Involved in the Purification of Sewage," after which Mr. Carr conducted the members round the sewage works which have been recently altered and enlarged under the advice of Mr. H. Howard Humphries, M.I.Mech.E. The members subsequently adjourned to "The Poplars," Ruislip Village, for tea.

THE Southwark Board of Guardians propose to raise a loan of 50,000*l.* to acquire the Bow Infirmary, the property of the City Guardians, which is unoccupied, and negotiations have been entered upon with a view to purchasing the property.

AT the last meeting of the Mersey Docks and Harbour Board the proceedings of the works committee included a recommendation to deposit a number of concrete blocks, &c., on the river bed adjacent to the entrances to the Brunswick Dock, to check erosion, at an estimated cost of 5,000*l.* In accordance with standing orders the recommendation will be further considered at the next meeting of the Board.

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"SINE QUA NON" KITCHEN RANGE.
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[Copy] 46 Newcastle St., London, E. June 8, 1909.
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We are, Gentlemen, yours faithfully,
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LIGHTING OF PUBLIC STREETS.

IN March last a deputation of the streets committee of the Corporation of London appointed to visit certain Continental cities for the purpose of inspecting the various systems of public lighting, visited the following cities, viz.:—Brussels, Cologne, Düsseldorf, Berlin, Dresden, Vienna, Munich and Paris.

The deputation have now issued a report giving particulars of the different systems of lighting inspected, from which it will be seen that in every city, gas as well as electricity is used. Particulars are also appended of the lighting in the City of London.

In Brussels.—The main thoroughfares, squares and market places are lighted by means of electric arc lamps, with an ordinary incandescent gas burner on each side. The arc lamps are turned off at midnight, after which time the lighting is supplied by gas. The side streets are lit with incandescent gas.

Cologne.—The important streets of the city are lit by centrally hung electric arc and flame lamps, with lowering gear, the open spaces by a combination of electricity and gas, and the minor streets mainly by incandescent gas lamps upon standards.

Düsseldorf.—This city is lit in a somewhat similar manner to Cologne, arc lamps centrally hung and upon standards, and by incandescent gas.

Berlin.—The general arrangement for lighting is by means of electric arc lamps, centrally hung and upon standards, electric glow lamps, and high-pressure incandescent gas lamps with inverted mantles. The Berlin authorities have decided to spend seven million marks (350,000*l.*) in installing the latest patterns of high-pressure gas lamps with inverted burners in lieu of the existing gas and electric lamps. Expenditure in this direction has been going on for two years at the rate of one million marks (50,000*l.*) a year, and will be continued at the same rate for the next five years. The lamps used are graded according to the importance of the thoroughfares—at junctions of main streets, lamps of 4,000 candle power; in main thoroughfares, lamps of 2,000 candle power; and in other streets, lamps of 1,000, 600, 400 and 200 candle power, the 400 and 200 candle power lamps being on low pressure. So far as gas is concerned, four-fifths of the city is lighted by the municipal authority, and the remaining one-fifth by the Imperial Continental Gas Association. In some streets where the municipal authority and Association meet, the latter are putting in the same kind of burner as the former.

Dresden.—Electric arc lamps of the "open" and "flame" type are used in this city, a considerable number being suspended across the centre of the streets, with side lowering gear. Electric glow lamps are also used. The side streets are lit with low-pressure incandescent gas lamps. The electric arc lamps are switched off at midnight, leaving incandescent gas lighting only.

Vienna.—Electric arc lamps upon standards with incandescent gas lamps fixed upon brackets below, together with low-pressure incandescent gas lamps fitted with upright and inverted mantles.

Munich.—Electric arc lamps centrally hung and upon standards, also electric glow lamps and low-pressure incandescent gas lamps.

Paris.—Electric arc lamps upon standards, and low-pressure incandescent gas lamps. The general arrangements are the same as in London.

Having very carefully considered the various systems, the deputation are of opinion that the public lighting in the City of London can be materially improved, and have come to the following conclusions:—

1. That, wherever possible, streets should be lighted by means of centrally hung lamps with lowering gear. (This we think particularly important in the City of London where the number of obstructions upon the footways in the form of lamp posts, bins, letter-boxes, &c., is so large.)
2. That open spaces should be lighted by means of lamps upon standards, fitted with lowering gear.
3. That high-pressure incandescent gas lamps with inverted burners should be adopted as the illuminant, but where gas is impracticable, electricity with open arc and flame arc lamps should be installed.

It is thought, however, before suggesting any drastic alterations in the general lighting of the City, that the streets committee should be authorised to arrange for some further experimental lighting of the City thoroughfares.

The total number of electric arc lamps in the City of London is 450; 380 open arc lamps and twenty flame lamps

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are fixed upon columns and brackets; the average distance between the open lamps is 126 feet, the average height of the lamps being about 18½ feet. The cost of each of the open lamps is 26*l.* per annum, and of each flame lamp 17*l.* 10*s.*

In accordance with the resolution of the Court of Common Council of July 25, 1907, permitting the two electric lighting companies having statutory powers in the City to experiment with the newest form of electric lamps for street lighting in the thoroughfares of Holborn, Holborn Viaduct, Old Bailey (part of), the lamps being placed about 20 feet from the ground, Cannon Street (between St. Paul's Churchyard and Dowgate Hill) at a height of 28 feet, and Farringdon Street at a height of 14 feet, the Charing Cross and Strand Electricity Supply Company proceeded with the lighting of their portion, viz., Cannon Street, by erecting eleven "Oliver" magazine flame arc lamps, centrally hung, and suspended over the roadway by wires attached to the buildings on either side. The lamps were put into lighting in November, 1907, and 17*l.* 10*s.* per lamp is the price paid for the experimental running. This is the price quoted by the company for a contract for not less than 250 of such lamps.

The City of London Electric Lighting Company also proceeded with the carrying out of their experiment by substituting twenty-one "Oliver" flame arcs for a similar number of the original "open" arcs, adapting the existing standards in Holborn, Holborn Viaduct, and part of Old Bailey, whilst in Farringdon Street eighteen enclosed arcs of the "Reason" type were fitted up on special short columns in lieu of the 12 original "open" arc lamps and columns in that thoroughfare. The installation of this area was completed in November, 1907. The cost of the "Oliver" flame arcs in the Holborn area is 17*l.* 10*s.* each per annum, being equivalent to the charge for similar lamps in Cannon Street. The cost of the enclosed arcs in Farringdon Street is 12*l.* 10*s.* each per annum. The "Oliver" flame arc lamps at Ludgate Circus and Ludgate Hill, put into lighting this year, are fixed at a height of 18.5 feet above the roadway, as against 20.5 with the experimental lamps of the same type at Holborn.

High-pressure Incandescent Gas Lighting.—There are 119 high-pressure Keith gas lamps in the City thoroughfares. These lamps consume 10 cubic feet of gas per hour, and give an illuminating value of 300 candles each, at a cost of 7*l.* 5*s.* per lamp. They are from 60 to 70 feet apart on the diagonal, the height of burner from roadway being about 12 feet. They are fixed upon the house fronts, the roadway being about 50 to 60 feet wide. The lamps burn at 10-inch pressure from a special water-compressing plant placed in the adjacent pipe subway. The Corporation provided the compressing plant, services, lamp brackets and lanterns. Forty-five upright two-burner lamps are fixed in Queen Victoria Street, each consuming about 20 cubic feet of gas per hour, and giving a light equal to 600 candles, the annual cost per lamp being about 13*l.* 2*s.* 3*d.* per annum. The lamps are fixed upon columns on the footpaths, about 100 feet apart on the diagonal. The burners are 13 feet 6 inches above the roadway, the street being about 70 feet wide. The lamps burn at 10 inches pressure from a high-pressure trunk main direct from the gasworks, the Corporation providing the standards and lamps. Seventeen high-pressure single-burner lamps (inverted mantles) have been fixed in Fleet Street and Chancery Lane upon brackets on the house fronts. These lamps each consume 25 cubic feet of gas per hour, and give a light of 1,500 candles, at an inclusive charge of 16*l.* 10*s.* per annum. They are supplied from a special 6-inch high-pressure main connected with a compressor house in the immediate neighbourhood, the pressure being 54 inches (water-gauge). These lamps are about 103 feet apart on the diagonal, the height of the burners from the roadway being 13 feet to 16 feet, the street being from 45 to 70 feet wide, the Gas Company providing the necessary compressing plant, mains, services, brackets and lanterns. There are also several other "Keith" and "Sugg's" high-pressure lamps, fitted with upright 2, 3, 4 and 6 burners, on rests at the junction of roadways, of 1,000, 1,300, 2,000 and 3,000 candles, making 119 in all. In addition to the above the four City bridges are lighted with "Sugg's" high-pressure upright burner lamps, some 135 in number, giving 30 candles to the foot of gas; they are single burner lamps with clusters on the centre of the bridges, and have been in lighting for about eight years, having been installed and maintained by the South Metropolitan Gas Company. The gas is compressed by separate gas and water driven machinery on the bridges, except at Blackfriars, where the gas is taken direct from the high-pressure main of the Gas

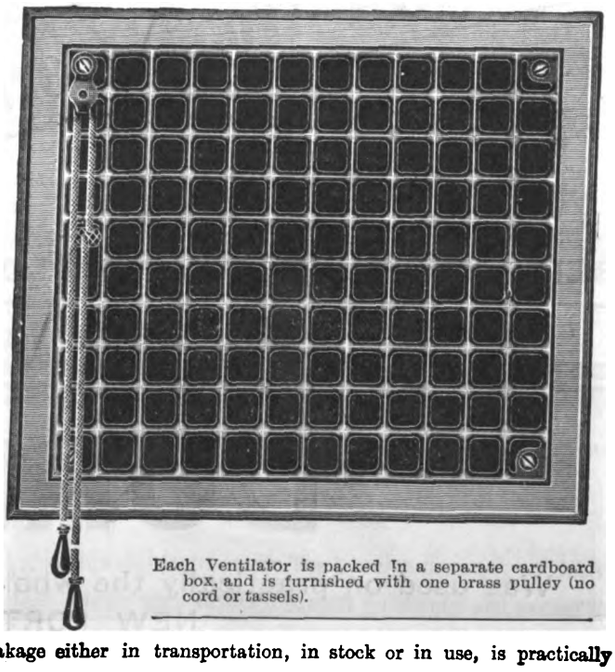
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Light and Coke Company. The aggregate length of the four bridges is about one mile, the widths of the roadways varying from 45 to 70 feet. An experimental three-burner inverted "Keith" high-pressure lamp has been fixed in Fleet Street, consuming the same amount of gas as the single burner, and gives, it is stated, a like illumination, viz., 1,500, but with a better diffusion. Its improvement is, that if one mantle breaks, the remaining two will give a good light until a new mantle is put on, instead of the lamp being out. The annual cost of the lamp would be the same as the single burner. In Queen Victoria Street, an experimental four-burner "Keith" high-pressure inverted lamp has been fixed in one of the existing high-pressure lanterns in place of the two upright burners. The consumption of the four burners is the same as the upright burners, viz., 20 cubic feet per hour. It is claimed that the candle power is increased about 50 per cent., viz., 45 instead of 30 candles per cubic foot of gas, giving a total of 900 instead of 600 candles. The maintenance cost would be the same.

The "Keith" Lamp.—For the purpose of comparison, the "Keith" inverted lamp gives sixty candles per foot of gas consumed, against fifty-one to fifty-three and a half candles and 25 feet consumption against 28 feet of the "Graetzin," therefore "Keith" single burner 25 feet per hour at sixty candles per foot as tested on photometer, equals 1,500 candles. "Graetzin" single burner 28 feet per hour at fifty-one to fifty-three and a half candles per foot, as claimed by Berlin figures, equals 1,400 to 1,500 candles. A specimen of the newest form of "Graetzin" lamp with three burners has also been fixed in Fleet Street on the existing compressing plant, giving an illuminating value of about 4,400 to 4,555 candles with a consumption of about 84 cubic feet of gas per hour.

Incandescent Gas Lighting—Low-pressure.—The number of gas lamps, principally single burners of the upright type, at the end of the year 1908 was 2,640—each consuming 4¼ cubic feet of gas per hour, the illuminating power being sixty-five to seventy candles. Owing to the narrowness of the side streets the lamps are nearly all fixed on brackets about 60 feet to 70 feet apart, at a height of about 12 feet from roadway to burner, the annual cost of each lamp with gas at 2*s.* 5*d.* per 1,000 cubic feet being 3*l.* 10*s.* 2*d.* This cost includes maintenance of mantles, &c., but does not cover capital charges. A few two, three and five burner lamps are fixed upon standards on the rests in the main roads and squares.

Low-pressure Inverted.—The only low-pressure inverted gas lamps in the City are a few "Carpenter" one and two-burner lamps on trial, with a stated consumption of 4 and 8 cubic feet per hour, and 100 and 200 candle power respectively, being a claimed efficiency of twenty-five candles to the foot of gas consumed. The price of gas for public lighting up to Midsummer was 2*s.* 5*d.* per 1,000 cubic feet, but this amount was then reduced by 1*d.*, and a further reduction of 2*d.* per 1,000 cubic feet will be made as from January 1, 1910, when the Gas Light and Coke Company will reduce the illuminating value of their gas from sixteen to fourteen candles, under their Bill now before Parliament, which has passed the third reading of the House of Commons. The effect of these reductions will be to decrease the annual cost of the newest type of high-pressure inverted gas lamp, as in Fleet Street, from 16*l.* 10*s.* to 15*l.* 2*s.* 6*d.*, and all other gas lamps proportionately.

MR. HARRY COCKSHUT, of Edinburgh House, Brondesbury, N.W., a director of the Wallpaper Manufacturers, Ltd., left estate of the gross value of 133,776*l.*, of which the net personalty has been sworn at 119,367*l.*

THE Swansea painters' strike terminated last Friday, and 200 men, who have been out for several days, will resume work immediately. The men decided to accept the offer made at the meeting of the employers to have the matter in dispute arbitrated upon by the Board of Trade. The Swansea plasterers' strike, which has lasted nearly twelve weeks, continues.

PLANS have been passed by the Windsor Town Council for a new theatre and opera house at Windsor, which will be erected on the site of the old building which was burned out a year or so ago. The new theatre will seat over 1,000 persons, and will cost about 20,000*l.* The money is being found by a local syndicate. It is expected that the new theatre will be ready for opening by the end of January. The plans are by Mr. Harry St. J. L. Percival, architect and surveyor, 47 Mortimer Street, Cavendish Square, W.

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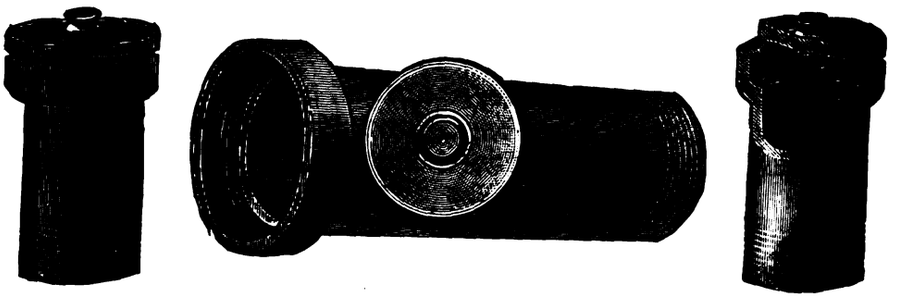
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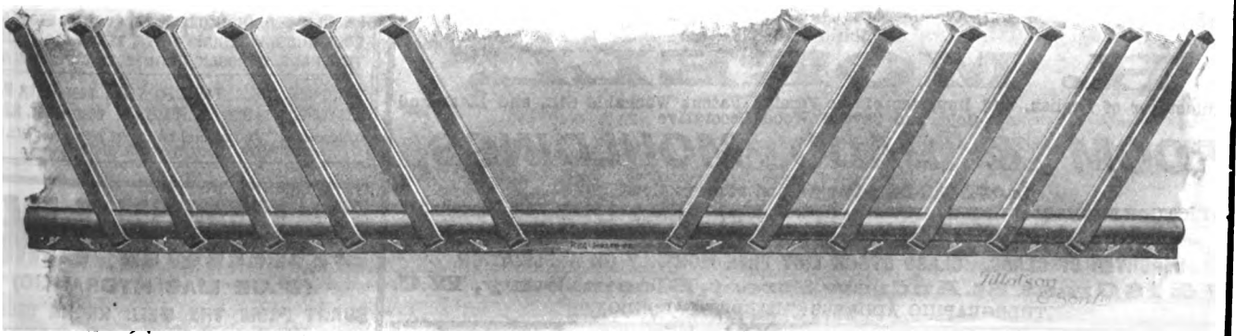
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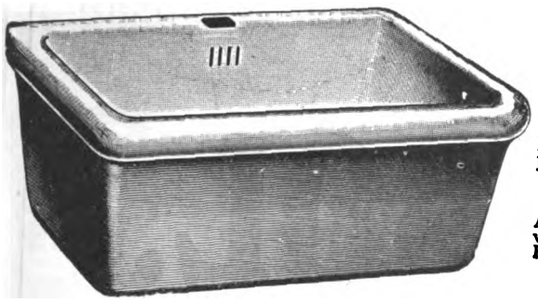
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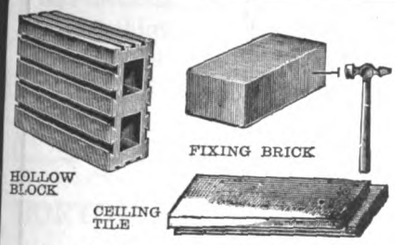
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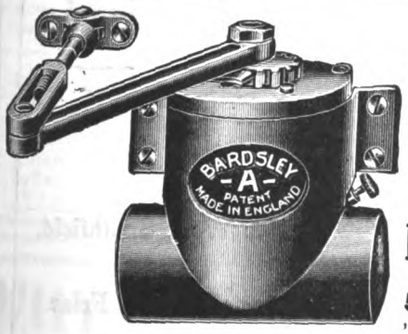
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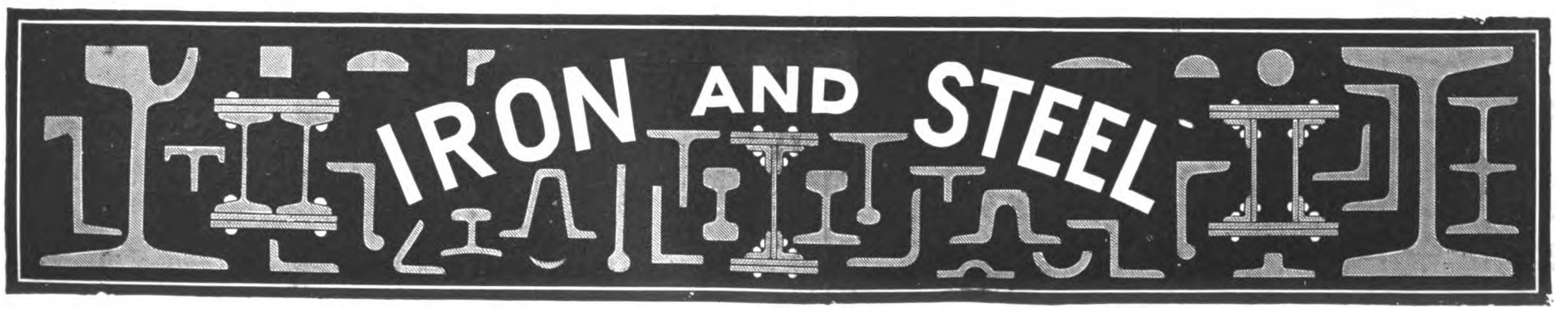
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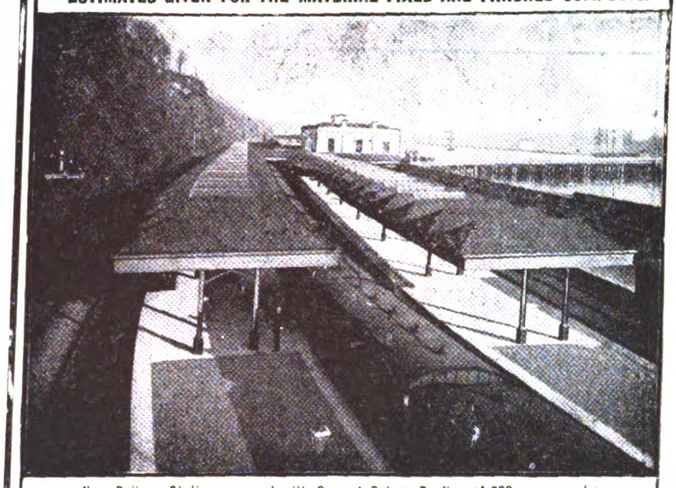
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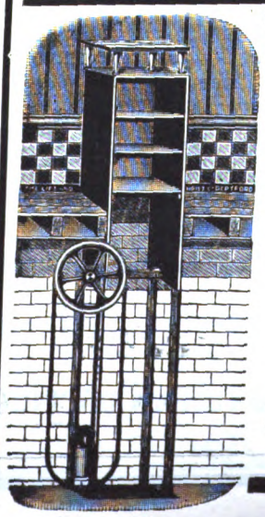
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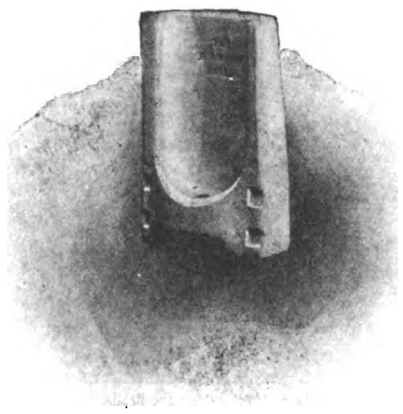
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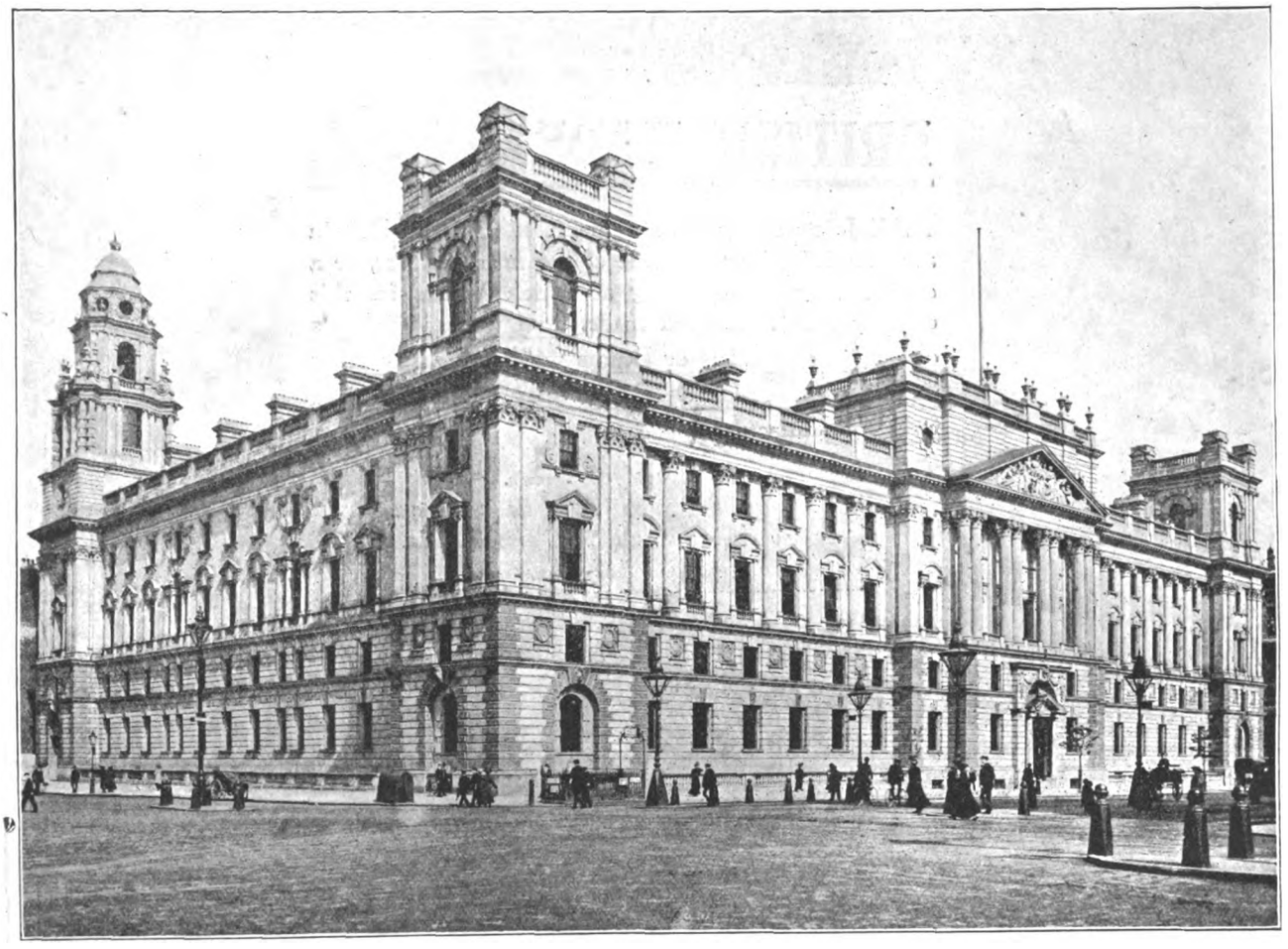
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Architect and Contract Reporter.

FRIDAY, AUG. 6, 1909.

Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s 6d. All business communications to the Managing Director,

P. A. GILBERT WOOD,

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

DEPTFORD.—Sept. 1.—The Metropolitan Borough Council of Deptford invite designs for a branch library at New Cross, S.E. Premiums of 50 guineas, 25 guineas and 10 guineas will be awarded. Assessor, Mr. J. S. Gibson, V.P.R.I.B.A. Deposit 1*l.* 1*s.* Competition is limited to architects practising in the city or county of London. Mr. Vivian Orchard, Town Clerk, Town Hall, New Cross Road, S.E.

FOREST HALL.—Aug. 30.—The Northumberland education committee invite designs from architects practising in Northumberland and Newcastle for an elementary school for 250 scholars. Mr. C. Williams, secretary, The Moothall, Newcastle-on-Tyne.

HUDDERSFIELD.—Aug. 31.—Plans are invited for a church to seat 400, to cost about 2,000*l.*, not to exceed 2,500*l.*, with all fittings, furnishings, lighting and heating apparatus. The Rev. D. Macrae Tod, B.D., St. James's Manse, Huddersfield.

HULL.—Oct. 11.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

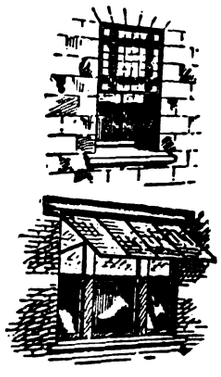
NEWBURN.—Sept. 1.—The Newburn Urban District Council invite designs from architects practising in Newcastle-on-Tyne and Northumberland for new council chamber, offices and caretaker's house. The author of the best design will carry out the work; a premium of 10*l.* will be awarded

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Wales.—Oct. 1.—The Urban District Council of Aberdare invite competitive designs for a fever hospital for fifty-two patients, including administrative block, outbuildings, &c. Premiums of 100*l.*, 50*l.* and 25*l.* An assessor will be appointed on the nomination of the President of the R.I.B.A. Deposit 3*l.* 3*s.* Mr. T. Phillips, clerk, Town Hall, Aberdare.

CONTRACTS OPEN.

Barrow-in-Furness.—Aug. 21.—For the restoration of the stonework of the Town Hall buildings. The Borough Engineer's office, Town Hall.

Belfast.—Aug. 11.—For the construction of a monolith of concrete to carry a stair and timber slide at the rear of the west wall of the New Graving Dock near Clarence Wharf, and other works in connection therewith, for the Belfast Harbour Commissioners. Mr. W. Redfern Kelly, M.I.C.E., harbour engineer, Harbour Office, Belfast.

Belvedere (Kent).—Aug. 14.—For the erection of a porter's lodge at Erith Sanatorium, Little Heath, Belvedere, for the Erith Urban District Council. Deposit 1*l.* The Surveyor, Erith.

Bickerstaffe (Lancs.).—Aug. 9.—For the construction and erection of an engine and boiler-house, chimney, cottages and other buildings, near Royal Oak. Deposit 5*l.* 5*s.* Messrs. H. Rofe & Sons, civil engineers, 8 Victoria Street, Westminster, S.W., and Oxford Chambers, Victoria Square, Leeds.

Bigrigg (Cumberland).—Aug. 9.—For erection of four dwelling-houses at St. John's Terrace, Bigrigg. Mr. Geo. Nelson, architect, 22 Lowther Street, Whitehaven.

Bingley.—Aug. 9.—For the mason, joiner, plumber, plasterer, and slater's works required in the additions to manager's house, Bingley, for the Bank of Liverpool, Ltd. Mr. James Hartley, architect, Skipton.

Birmingham.—Aug. 24.—The Commissioners of His Majesty's Works and Public Buildings invite schemes and tenders based thereon for the reinforced concrete portions of the Birmingham Head Post Office. Any system or systems of construction may be adopted for the whole or any part of the work. Deposit 1*l.* 1*s.* Mr. J. Rutherford, the Board's architect, 17 Delahay Street, S.W.

Bowburn.—Aug. 14.—For erection of a small Wesleyan Methodist chapel, &c., at Bowburn Colliery. Deposit 10*s.* 6*d.* Mr. J. Wilson Hays, architect, Wingate, co. Durham.

Brompton.—Aug. 7.—For the several trades required in erection of house at Brompton, near Northallerton. Mr. W. H. Bourne, A.R.I.B.A., architect, Houndgate Chambers, Darlington.

Chatham.—Aug. 7.—For additions to Royal Sailors' Home. Deposit 1*l.* 1*s.* Mr. George E. Bond, architect, 384 High Street, Rochester.

Crediton.—Sept. 6.—For building a secondary school for girls. Deposit 2*l.* 2*s.* Apply by Aug. 13 to the County Architect (Education), Richmond Road, Exeter.

Cove and Hawley (Hants).—August 9.—For erection of a Council school for 140 children at Cove. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Cromford.—Aug. 24.—For the widening of Lea County bridge, at Lea Mills, near Cromford, Derbyshire. The bridge is a stone arch of 16-feet span and is to be widened 10 feet. Mr. J. W. Horton, A.M.I.C.E., county surveyor, St. Mary's Gate, Derby.

Cross Hills.—Aug. 13.—For erection of a detached residence. Mr. F. W. Petty, architect, Cross Hills, Yorks.

Doncaster.—Aug. 7.—For factory and business premises, Trafford Street. Mr. F. Norman D. Masters, M.A., architect, Bank Chambers, Scot Lane, Doncaster.

Duloe.—Aug. 7.—For erection of a farmhouse, farm buildings, and water supply at Blackdown, Duloe, near Liskeard, for the small holdings committee of the Cornwall County Council. Mr. S. G. Carnell, county land agent, Public Rooms, Truro.

Durham.—Aug. 16.—For erection of a girls' school at St. Hild's College. Deposit 1*l.* 1*s.* Messrs. Joseph Potts & Son, architects and surveyors, Sunderland..

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Eastleigh (Hants).—Aug. 23.—For the following contracts in connection with boys' and girls' elementary school, Eastleigh, 800 children. Contract No. 1:—Erection of a school of two floors to accommodate 800 children. Deposit 5*l.* 5*s.* Contract No. 2: For construction of about 900 square yards of Hennebique concrete flooring in the new school. Deposit 2*l.* 2*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Eccles.—Aug. 21.—For erection of a secondary and technical school at Park Road, Monton. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Exeter.—Sept. 4.—For erection of a University college extension building and day training college, for the Exeter Education Authority. Deposit 2*l.* 2*s.* Send names by Aug. 10 to Messrs. Tait & Harvey, architects, Bampfylde House, Exeter.

Edinburgh.—Aug. 21.—For alterations and the addition of one storey to the Edinburgh General Post Office. Deposit 1*l.* 1*s.* His Majesty's Office of Works, Edinburgh.

Halstead.—Aug. 31.—For the erection of an elementary school at Halstead, Essex, to accommodate 420 children. Deposit 5*l.* Send names by August 9 to Mr. J. Sydney Parmenter, Q.S.A., 73 Duke Street, Chelmsford.

Haslingden.—Aug. 10.—For converting Pike Law Farmhouse into a home for boys, for the Guardians. Mr. H. Ross, architect, 15 Cannon Street, Accrington.

Headcorn (Kent).—Aug. 10.—For the execution of repairs and painting, &c., at the Council schools. Mr. T. W. Burden, correspondent, Headcorn.

Houghton-le-Spring.—Aug. 7.—For the construction of new boundary walls and repairs to existing walls at the Newbottle Street depôt, together with repairs to the boundary walls and the pointing of the caretaker's house at the Flint Mill Sewage Farm. The Surveyor of the Council, Newbottle Street, Houghton-le-Spring.

Keighley.—For the erection of St. James's Church, Cross Roads. Messrs. J. B. Bailey & Son, architects, 3 Scott Street, Keighley.

London.—Aug. 12.—For builder's work and alterations in connection with kitchen, scullery and larder at the St. Marylebone Infirmary, Rackham Street, Notting Hill, W. Deposit 5*l.* Send names by August 7 to the Steward, at the infirmary.

London.—Aug. 19.—For the erection of receiving homes for children facing the Aldersbrook Road, Wanstead, for the Guardians of the West Ham Union Deposit 10*l.* Send names by August 19 to Mr. William Jacques, A.R.I.B.A., 2 Fen Court, Fenchurch Street, E.C.

London.—Aug. 19.—The Commissioners of H.M. Works and Public Buildings invite constructional schemes and tenders based thereon for erection in reinforced concrete of the new building for the Money Order Department of the Post Office at Manor Gardens, Holloway, N. Deposit 3*l.* 3*s.* Mr. J. Wager, A.R.I.B.A., M.C.I., at H.M. Office of Works, &c., Storey's Gate, S.W.

Luton.—Aug. 26.—The Town Council invite constructional schemes and tenders based thereon for reinforced concrete floors and a circular dome in connection with the new public library. The Borough Engineer's Office, Town Hall, Luton.

Macclesfield.—Aug. 11.—For the erection and completion of an addition to the Nurses' Home on the hospital land in Moss Lane. Deposit 10*s.* 6*d.* The Borough Engineer, Town Hall, Macclesfield.

Newcastle-upon-Tyne.—Aug. 10.—For extensions to Rutherford College. Deposit 2*l.* 2*s.* Mr. A. C. Coffin, Education Offices, Northumberland Road, Newcastle-upon-Tyne.

Padiham.—Aug. 11.—For construction of a retort-house and coal-store in the new gasworks. The Gas Engineer, Council Offices, Mill Street, Padiham.

Penistone.—Aug. 12.—For the formation and construction of a cattle market. Deposit 10*s.* 6*d.* Mr. C. Hodgkinson, clerk, Penistone.

Preston.—Aug. 21.—For taking down the existing buildings between the County Council offices in Fishergate Hill and the Constabulary Offices in Jordan Street, and erecting new offices on the site. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Ravensthorpe.—Aug. 12.—For the various works required in erection of eight houses near North Road, Ravensthorpe, Yorks. Messrs. Kirk, Sons & Ridgway, F.R.I.B.A., architects, surveyors and valuers, Market Place, Dewsbury.

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Sheffield.—Aug. 10.—For erection of the Training College Hall of Residence for Men, and also for the heating and the electric lighting of same. Messrs. Gibbs & Flockton, architects, 15 St. James Row, Sheffield.

Sheffield.—Aug. 18.—For erection of additional offices, mess-room and retaining wall at Lumley Street destructor. Deposit 1*l.* 1*s.* The City Engineer and Surveyor, Town Hall, Sheffield.

Soothill.—Aug. 9.—For erection of house, Leeds Road, Soothill, Yorks (top of cutting). Mr. John H. Brearley, architect, 68 Commercial Street, Batley.

Staincliffe.—Aug. 7.—For six houses at Staincliffe, Yorks. Messrs. John Barton & Son, architects and surveyors, Halifax Road, Dewsbury.

Trowbridge.—Aug. 10.—For erection of a weights and measures office, in Hill Street. Mr. J. George Powell, county surveyor, County Offices, Trowbridge, Wilts.

Uxbridge.—Aug. 9.—For additional lavatory accommodation in the aged men and women's quarters at the workhouse. Mr. W. L. Eves, surveyor, 54 High Street, Uxbridge.

Wales.—Aug. 7.—For extensions and alterations to the Abergavenny Girls' Secondary school. Deposit 2*l.* 2*s.* Mr. E. A. Johnson, architect, Abergavenny. Also for extensions and alterations to the Abertillery County Secondary school. Deposit 2*l.* 2*s.* Mr. R. L. Roberts, architect, Abercarn.

Wales.—Aug. 9.—For erection of a steward's dwelling house adjoining the club premises and for the construction of additions and alterations to the present Constitutional Club, Caerau, near Bridgend. Deposit 1*l.* 1*s.* Mr. J. R. Snape, solicitor, 3 Talbot Street, Maesteg.

Wales.—Aug. 9.—For erection of five pairs of semi-detached cottages at Merthyr Vale, for the Merthyr Vale Building Club. Mr. William Dowdeswell, architect, Treharris.

Wales.—Aug. 10.—For alterations and additions to De Winton Hotel, Tonypandy. Mr. W. D. Morgan, M.S.A., architect, Pentre.

Wales.—Aug. 11.—For the following works for the Glamorgan County Council, viz.:—(1) Erection of new school at Aber (Ogmore Vale); (2) additions to the Pontypridd county school; (3) alterations to the Skewen Lower Council school at Skewen; (4) boundary wall and iron fencing at Hoelycyw Council school, near Bridgend. The Glamorgan County Council Offices, Westgate Street, Cardiff.

Wales.—Aug. 12.—For erection of a church at Bedlinog. Deposit 1*l.* 1*s.* Mr. William Dowdeswell, architect, Treharris.

Wales.—Aug. 12.—For erection of twelve or more cottages at Quaker's Yard, for the Quaker's Yard Model Cottage Building Club. Mr. P. M. Howard, architect and surveyor, Wern Crescent, Nelson, via Cardiff.

Wales.—Aug. 13.—For the erection of a cottage hospital at Nantyglo, Mon. Deposit 2*l.* 2*s.* Mr. N. G. Lewes, F.I.A.S., architect, Blaena, Mon.

Wales.—Aug. 13.—For erection of a cottage hospital and appurtenances to be erected at Nantyglo, Mon. Mr. James Pitman, secretary, Cwmcelyn, Blaina, Mon.

Wales.—Aug. 16.—For erection of four houses at Park Road, Pontypool. Mr. D. J. Lougher, Bank Chambers, Pontypool.

Wales.—Aug. 16.—For erection of sixteen semi-detached houses for the Tyishaf Building Club, Blackwood, Mon. The Secretary, Foresters' Arms, Blackwood, Mon.

Walney (Barrow-in-Furness).—Aug. 9.—For erection of a waiting-room and convenience on the Promenade. The Borough Engineer's Office.

Westwell.—Aug. 14.—For the execution of painting and repairs at the Westwell Council school and teachers' dwelling-house. Mr. D. Brown, correspondent, Cow Lees, Westwell.

Winchester.—Aug. 19.—For new servants' hall, kitchener and rearrangement of hot-water service, with other work, Chief Constable's house, Winchester. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Wordsley.—Aug. 14.—For erection of a Council school for 418 children at Wordsley, near Stourbridge. Deposit 1*l.* 1*s.* Apply by August 14 to Mr. Graham Balfour, director of education, County Education Offices, Stafford.

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WOLVERHAMPTON.—Aug. 13.—For restoration and preservation of the decayed stonework at the Art Gallery and School of Art off Lichfield Street. The Borough Engineer's Office.

WREXHAM.—Aug. 24.—For the construction of a convenience on land off Town Hill, and also the removal from Brook Street of an iron convenience and its re-erection in Tenter's Square. Separate tenders. Mr. John England, borough engineer, Willow Road, Wrexham.

YARMOUTH, ISLE OF WIGHT.—Aug. 16.—For repairs to the pier, for the Town Trust, Yarmouth, I.W. Messrs. Newman & Cocks, surveyors, Ryde.

AT the last meeting of the Fenny Stratford Urban Council, Mr. Chadwick, engineer for the proposed Sand House water supply scheme, brought up a report, and said the cost of the scheme was estimated at 11,644*l.*, or, with fees and contingencies, about 12,000*l.* This sum was made up as to the larger items of—cost of boring and well 3,000*l.*, land 1,200*l.*, mains 3,000*l.*, reservoir 2,700*l.*, house and machinery 1,500*l.* It was agreed that the Clerk seek an interview with the Local Government Board authorities and arrange for a local inquiry to be held as soon as possible.

JUDGE DODD, sitting in Hull county court last week, complained of the ventilation of the court-room, and ordered an official to smash a window, which was done. The Corporation's property committee, having considered his Honour's action, have adopted the following resolution:—"That this committee, having the control of the property of the Corporation, strongly protests against and resents the high-handed and unwarrantable action of his Honour Judge Dodd in causing the window of the County Court to be broken on July 27, on the plea of obtaining additional ventilation, and considers that if the ventilating apparatus of the court was found defective or insufficient a report to that effect should have been made to the Council as the owners of the building; also that a copy of this resolution be forwarded to his Honour Judge Dodd."

TENDERS.

AUDENSHAW (LANCS.).

For street works, Wellington Street, &c. Mr. W. CLOUGH, engineer and surveyor, Audenshaw.

Clarke	£2,269 8 7
Marland	1,840 19 7
Hobson	1,773 7 6
Randall	1,678 18 6
Gosling & Stafford	1,647 1 4
WORTHINGTON, Manchester (*accepted*)	1,500 11 10

BAKEWELL.

For the erection of baths. Messrs. BRYDEN & WALTON, architects, Buxton.

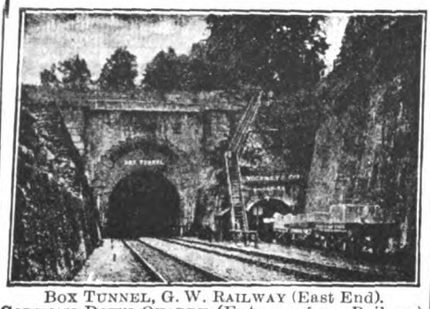
Wainer	£3,781 3 5
Williamson	3,773 0 0
Sharp	3,732 0 0
Pillough	3,559 0 0
Messom	3,552 0 0
Scattergood & Son	3,399 12 2
Cook & Sons	3,318 0 0
Oakes	3,317 18 0
Evan Bros.	3,211 14 7
Allsop & Son	3,203 0 0
Wildgoose	3,110 8 3
Eyre	3,087 9 2

BIRKENHEAD.

For erection of science class room, and alteration at the Higher Tranmere High School for Girls, Birkenhead. Mr. J. R. MEWTON, architect, Birkenhead.

Boulton	£767 14 0
Davies & Gaskell	688 14 0
Ford	679 0 0
Ellidge	656 0 0
Williams & Co.	650 0 0
Rothwell	645 0 0
SNAPE, Birkenhead (*accepted*)	631 0 0
Rimmer Bros.	630 0 0

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For sewerage works, Coldharbour Lane. Mr. E. E. Ryder, engineer to the Council, Bushey.

Swaker	£6,573 0 0
Muirhead & Co.	4,465 8 2
Brebner & Co.	3,961 0 0
Wilmott	3,634 2 8
Iles	3,600 0 0
Bloomfield	3,492 9 4
Wimpey & Co.	3,460 6 0
Adams	3,328 5 10
Pitkin	3,223 10 11
Cunliffe & Sons	3,152 12 4
Wilson, Border & Co.	3,049 1 0
Bell & Sons	2,983 8 9
Jackson	2,908 0 6
Bracey & Clark	2,884 0 0
W. & C. French	2,825 19 9
Wickstead & Beardsell	2,816 16 0
Bailey & Sons, Bushey Heath (*accepted*)	2,447 17 8

CARDIFF.

For the proposed extensions of the Cardiff Infirmary. Mr. E. M. Bruce Vaughan, F.R.I.B.A., Cardiff.

Shepston & Sons	£37,703 15 0
Britton	37,604 0 0
Blake	36,964 0 0
Stephens, Bastow & Co.	36,255 0 0
Williams	36,000 0 0
Cowlin & Son	35,900 0 0
Davies & Sons	35,550 0 0
Bosworth & Lowe	35,546 0 0
Evans Bros.	34,849 0 0
Moss & Sons	34,800 0 0
Symonds & Sons	34,754 7 4
Turner & Sons	34,660 0 0
Charles	34,659 0 0
Davies & Howell	34,498 0 0
Allen	34,453 7 10
Knox & Wells	34,143 0 0
Thomas & Co.	33,786 0 0
Bond	32,851 0 0

CONGLETON.

For alterations and additions at the Mossley school, comprising new infants' class-rooms, cloak-rooms, offices, drainage, &c. Mr. C. Russell Hall, architect, Congleton.

Bennett Bros.	£1,250 0 0
E. & A. Frith	1,010 0 0
A. J. & G. Worrall	894 18 0
T. & E. Cooke	860 0 0
W. Worrall & Co.	808 0 0
Brown, Congleton (*accepted*)	805 5 0

EAST KESWICK.

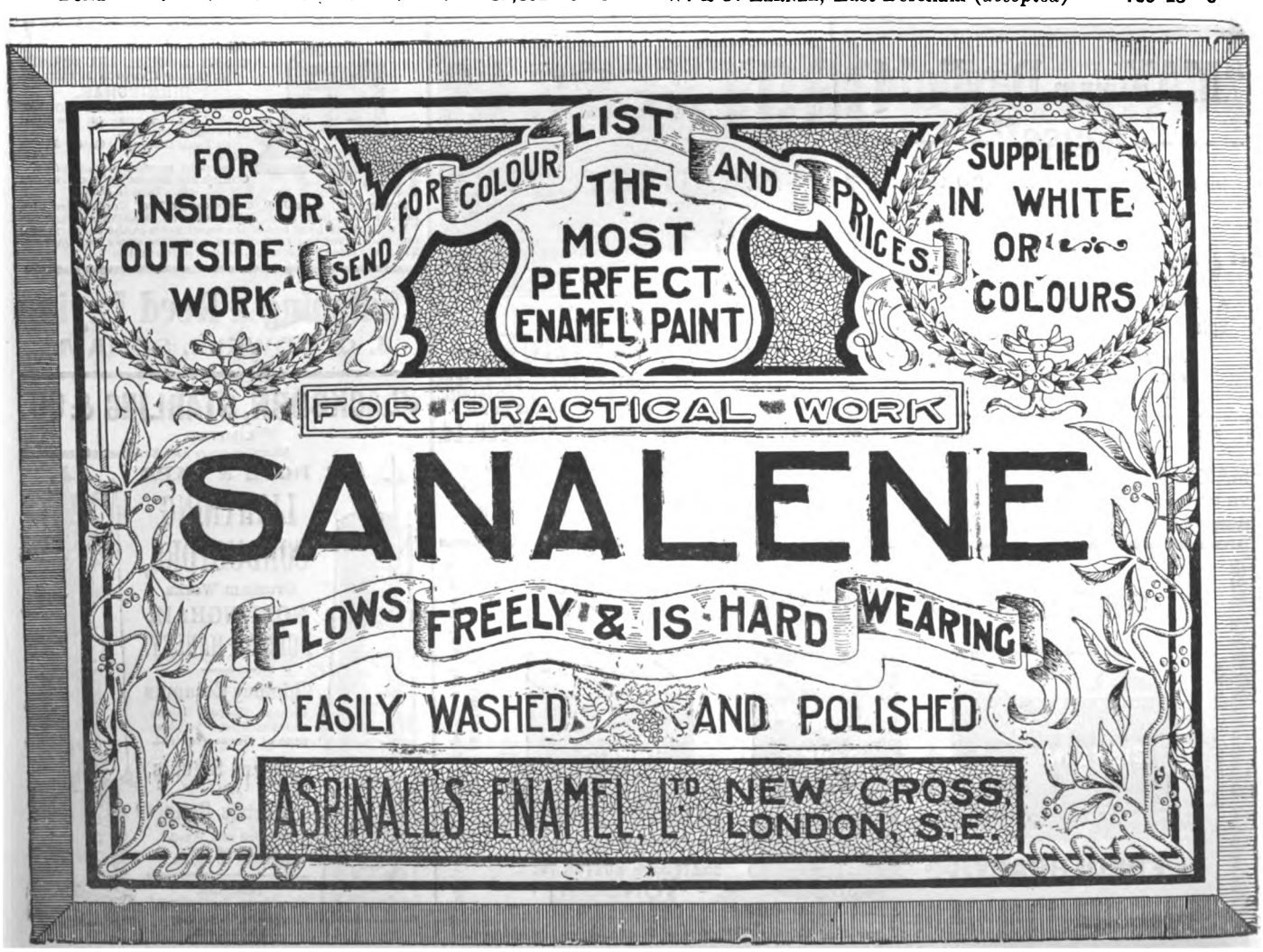
For sewerage works, for Wetherby Rural District Council. Mr. H. A. Johnson, M.Inst.C.E., 15 The Exchange, Bradford.

Riley	£2,340 0 0
Barker	2,292 3 8
Morley & Co.	2,070 13 0
Graham & Son	2,070 0 0
Arundell	2,069 8 0
Sugden	2,051 1 0
Arnold & Sons	2,050 0 0
Barker Bros.	2,018 4 0
Swinton & Dodd	2,013 7 10
Bushby & Sons	1,977 6 0
Barker & Sharp	1,944 8 0
Schofield	1,936 0 0
Briggs	1,924 9 3
Naylor & Son	1,878 0 0
Greaves & Wheater	1,863 14 10
Kell Bros., 15 Park Place (*accepted*)	1,756 0 0

EAST TUDDENHAM.

For alterations and additions to school. Messrs. Lacey & Upcher, architects and surveyors, Norwich.

Tofts	£1,260 10 6
Greengrass	1,137 0 0
Palmer	1,047 0 0
Howes	999 15 0
Scarles Bros.	982 0 0
Spencer, Santo & Co.	898 0 0
Hipperson	888 0 0
W. & J. Larner, East Dereham (*accepted*)	799 15 0



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GAINSBOROUGH.

For the installing of a new heating apparatus (low pressure) at St. John the Divine Church, Gainsborough.

Grindrod & Co.	£349 0 0
Newton, Chambers & Co.	329 0 0
Meadow Foundry Co.	327 10 0
Mellows & Co.	317 0 0
Goodacre, Glover & Buttes	310 8 0
Heating and Engineering Co.	304 0 0
Collins	300 0 0
Wells	297 0 0
Leeds Marble Co.	292 4 7
Tilley Bros.	280 0 0
Fox	275 0 0
Boulton & Paul	266 0 0
Parker	262 0 0
Ackroyd	260 0 0
Cook & Son	252 14 0
Bains Bros.	250 0 0
Dargue, Griffiths & Co.	249 15 0
Blackman & Co.	245 0 0
Mackintosh & Son	243 10 0
Pearce & Sons	240 0 0
Gimson & Co.	233 10 0
Longbottom & Co.	225 0 0
Milan & Co.	220 0 0
Trusswell & Sons	222 7 6
Smith & Co.	218 0 0
Seward & Co.	212 15 0
Henton & Co.	212 7 0
Ashworth & Sons	207 0 0
Robinson	195 0 0
Rosser & Russell	193 0 0
Kettle & Son	179 18 0
Richardson & Co., Darlington (*accepted*)	179 10 0
Dunning & Cook	174 15 0
Smyth & Co.	164 0 0
Spencer	163 0 0
Richardson	154 0 0

GRANTHAM.

For erection of a girls' secondary school at Grantham, for the Kesteven County Council (education committee). Mr. H. H. Dunn, A.R.I.B.A., architect, Silver Street, Lincoln.

School buildings.

Walker Bros.	£8,025 13 0
Halkes Bros.	7,360 13 1
Parker & Son	7,349 0 0
Fox	7,180 0 0
Wright & Son	7,148 0 0
Hedley	6,699 0 0
Read	6,625 0 0
Rudd & Son	6,600 0 0
Cracknell	6,571 0 0
Hockley & Co.	6,430 16 9
Maxey & Son	6,400 0 0
Faulks	6,310 0 0
Moss & Sons	6,300 0 0
Wainer	6,190 0 0
Corah & Son, Loughborough (*accepted*)	6,184 15 0
Bosworth & Lowe	6,138 0 0

Cottage.

Corah & Son (*accepted*)	356 10 0

Levelling.

Corah & Son (*accepted*)	236 8 0

GORLESTON-ON-SEA.

For erection of a Primitive Methodist church, Nile Road. Mr. Arthur S. Hewitt, A.R.I.B.A., architect, Great Yarmouth.

Accepted tenders.

Beech, bricklayer, mason, slater and plasterer	£623 6 4
Goffin & Co., carpenter, joiner, plumber, glazier and painter	450 12 6
Great Yarmouth Ironworks and Foundry Co., low-pressure hot-water heating	69 10 0
Wade, electric light	19 10 0

All of Great Yarmouth.

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SAMPLES SENT ON APPLICATION.

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GLOUCESTER.

For the erection of a Council school at Berkeley, for the Gloucestershire education committee.

	Estimate No. 1. Main Building.	Estimate No. 2. Cookery Centre.
Coats	£4,874 14 4	£724 10 8
King & Sons	3,539 0 0	514 0 0
Love	3,340 0 0	509 0 0
Gurney	3,226 0 0	463 0 0
Cooke	3,193 6 3	492 9 1
Collins & Godfrey	3,159 0 0	473 0 0
Walters & Son	3,155 0 0	467 0 0
Cousins	3,100 0 0	479 10 0
Jones	3,100 0 0	460 0 0
Colborne	3,095 10 0	464 0 0
Orchard & Peer	3,046 0 0	454 0 0
Nicholls	3,070 0 0	427 0 0
Bloodworth & Son	3,058 0 0	436 0 0
Byard & Son	2,984 0 0	450 0 0
Dorse	2,950 0 0	470 0 0
Dimery & Sons	2,937 16 0	435 8 0
Crane	2,897 0 0	443 6 10
Griffiths	2,880 0 0	435 0 0
Adams & Jefferies, Bristol (*accepted*)	2,590 0 0	448 0 0

HERNE BAY (KENT).

For erection of a cloak-room and for improved heating at the Council school, for the Kent education committee. Mr. H. W. Robinson, architect.

Horlocks	£1,250 0 0
Adams	1,187 0 0
Ingleton Bros., Herne Bay (*accepted*)	1,080 0 0

HEREFORD.

For additions to Council school, Burghill. Mr. G. H. Jack, county surveyor, Hereford.

Friend	£1,088 10 0
Hills	988 0 0
Cooke	984 0 0
Beavan & Hodges	965 0 0
Powell	956 0 0
Wilks, Hereford (*accepted*)	899 10 0

HEXHAM.

For Wall waterworks, for the Hexham Rural District Council. Mr. J. E. Parker, engineer, Newcastle-on-Tyne.

Cravelot	£1,200 0 0
J. & G. Douglass	711 14 8
Hardy & Son	671 11 3
Buckley	560 17 9
Stevenson	541 3 3
Thompson	523 13 11
Henderson	510 16 0
Blair	499 10 6
Harrison	496 10 0
Wickstead & Beardsell	459 10 5
Herdman	459 9 3
Henderson & Wilson	410 0 0
Skinner	399 8 1
Marshall & Co.	380 0 0

HOVE.

For internal painting, &c., and other works at Connaught Road, East Hove (Davigdor Road), Ellen Street, &c., schools, for the education committee. Mr. H. H. Scott, borough surveyor, Town Hall, Hove.

Hill	£240 0 0
McKellar	225 0 0
Leney	149 5 0
Gates & Sons	120 0 0
Olliver & Sons, Kemp Town (*accepted*)	118 15 0

LONDON.

For the exterior painting, &c., of Leadenhall Market and approaches, for the Corporation.

Candler & Sons	£849 5 6
Kirkaldy & Son	644 0 0
Harrison & Spooner	643 0 0
Shurmur & Sons	607 0 0
Johnson & Co.	579 0 0
Beaumont & Son	577 0 0
Holliday & Greenwood	542 0 0
Porter	537 5 0
Inns (*accepted*)	493 0 0

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LONDON—*continued.*

For (*a*) the construction of brick sewers in each case, and (*b*) alternatively for brick sewers in Berkeley Street, Coventry Street and James's Square, and a pipe sewer in King Street, for the Westminster City Council.

Tender (a).

Pedrette & Co.	£4,003	16	8
Muirhead & Co.	3,903	1	11
E. & E. Iles	3,552	18	2
Ewart	2,635	0	0
Parry & Co.	2,512	0	0
Killingback & Co.	2,365	5	1
Mowlem & Co.	2,279	0	0
Paterson (*recommended*)	2,201	0	0

Tender (b).

Pedrette & Co.	3,767	18	0
Muirhead & Co.	3,741	5	3
E. & E. Iles	3,392	3	4
Ewart	2,504	0	0
Parry & Co.	2,370	0	0
Killingback & Co.	2,249	10	6
Mowlem & Co.	2,186	0	0
Paterson (*recommended*)	2,057	0	0

For the erection of new offices, Blackfriars Road, S.E., for the trustees of the Sons of Temperance (London Grand Division). Mr. Arthur C. Russell, architect, Ilford. Quantities by Messrs. Andrews & Read, 13 Basinghall Street, E.C.

Knight & Sons	£6,987	0	0
Dawson	6,907	0	0
Ham	6,490	0	0
Brittain	6,190	0	0
Rice & Son	6,171	0	0
Hall, Beddall & Co.	5,893	0	0
Battley, Sons & Holness	5,843	0	0
Higgs & Hill	5,794	0	0
Holloway Bros.	5,750	0	0
Fairhead & Sons	5,695	0	0
Kingerlee & Sons	5,579	0	0
Marsland & Son (*accepted*)	5,460	0	0
Architect's estimate	5,400	0	0

LONDON—*continued.*

For repairing Charterhouse Street and West Smithfield, for the Corporation.

Greig & Matthews	£7,120	0	0
Griffiths & Co.	6,151	10	0
Mowlem & Co.	5,673	0	0
Anderson (*accepted*)	5,187	0	0

For pulling down and rebuilding shop premises, High Road, Streatham, S.W. Mr. Frank Bethell, architect, Bush Hill Park, Enfield, N.

Mason & Sons	£13,380	0	0
Johnson & Co.	11,060	0	0
Messon & Sons	10,150	0	0
Gaze & Sons	9,975	0	0
Burrage	9,950	0	0
Holloway	9,937	0	0
Mattock Bros.	9,850	0	0
Friday & Ling	9,700	0	0
Fairhead & Son	9,663	0	0
Thomas & Edge	9,649	0	0
Monk (*accepted*)	9,420	0	0

NORTHFLEET.

For making-up Springfield Road. Mr. J. A. Mitchell, district surveyor, Northfleet.

Wood & Sons	£1,774	6	9
Price	1,643	2	4
Road Maintenance and Stone Supply Co., Gravesend (*accepted*)	1,399	19	9

PENISTONE.

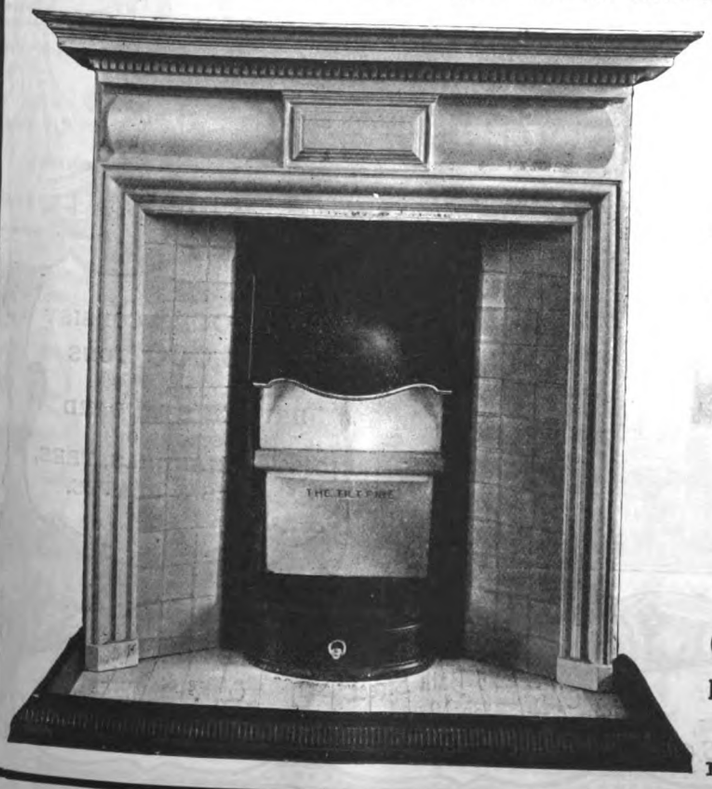
For carrying out extensions to the Penistone Grammar School.

Accepted Tenders.

Excavating, masonry, and bricklaying, Allott, Cook & Heywood, Cumberworth, 3,300*l.*; carpentering and joinery, Wood, Leeds, 1,859*l.*; plumbing and glazing, Rushworth, Shipley, 660*l.*; plastering, Airton, Denby Dale, 450*l.*; concreting, Keighley, Kirkstall, 345*l.*; heating apparatus, Rushworth, Shipley, 330*l.*; smith and girder work, Haigh, Leeds, 260*l.*; slating, Dawber, Townsley & Co., Ltd., 216*l.*; painting, Welham & Sons, Leeds, 128*l.* 4*s.* 7*d.*

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BRISTOL SHOWROOM: West India House, Welsh Back.

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RADLETT (HERTS).

For erection of detache dcottage at Radlett. Mr. George Gordon Samson, architect.

Carse	£569	0	0
Goodchild & Geoffrey	515	0	0
Lewin	495	0	0
Bushell	418	0	0
Curnick	410	0	0
Payne	397	0	0
W. & D. Wilkins	388	0	0
Jaggard	387	0	0
Chandler	375	0	0
Mantelow & Nash	332	0	0
Bannister	325	0	0
Vail & Shore (*recommended*)	317	0	0

READING.

For the adaptation of 3, 4 and 5 Market Place as temporary county offices. The County Surveyor, Reading.

Wilkins	£182	0	0
Searle	130	0	0
Newberry (*accepted*)	125	0	0

TRANMERE.

For erecting a science classroom, &c., at the Higher Tranmere High School for Girls. Mr. J. R. Newton, architect, Birkenhead.

Doulton	£767	14	4
Davies & Gaskell	688	14	0
Ford	679	0	0
Ellidge	656	0	0
Williams & Co.	650	0	0
Rothwell	645	0	0
Snape (*accepted*)	631	0	0
Rimmer Bros.	630	0	0

TREHAFOD.

For erecting six houses, for Mr. Richard Davies and others. Mr. E. Rees, architect and surveyor, Alexander Chambers, Pontypridd.

Jones, Pontypridd (*accepted*)	£1,200	0	0

WALES.

For erection of a new infants' Council school at Fochriw, Glamorgan, for the Glamorgan County Council. Mr. D. Pugh-Jones, F.S.I., county architect, Cardiff. Quantities by the County Architect.

Bond, Beda Road, Cardiff	£3,082	15	0

For erection of a new mixed school at Tonyrefail, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., county architect. Quantities by the County Architect.

Bond, Beda Road, Cardiff	£6,949	10	3

For erection of new laboratories at the Aberdare Intermediate School, for the Glamorgan County Council. Mr. D. Pugh-Jones, F.S.I., county architect, Cardiff. Quantities by the County Architect.

Shail, Llandaff, Glamorgan	£3,093	0	0

For rebuilding Moriah Calvinistic Methodist chapel, Llanstephan.

Howell & Son	£1,925	0	0
John Bros.	1,896	0	0
Davies	1,749	0	0
Jones, Carmarthen (*accepted*)	1,689	0	0

For additions and alterations to the Pencoed Mixed Council School, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., county architect. Quantities by the County Architect.

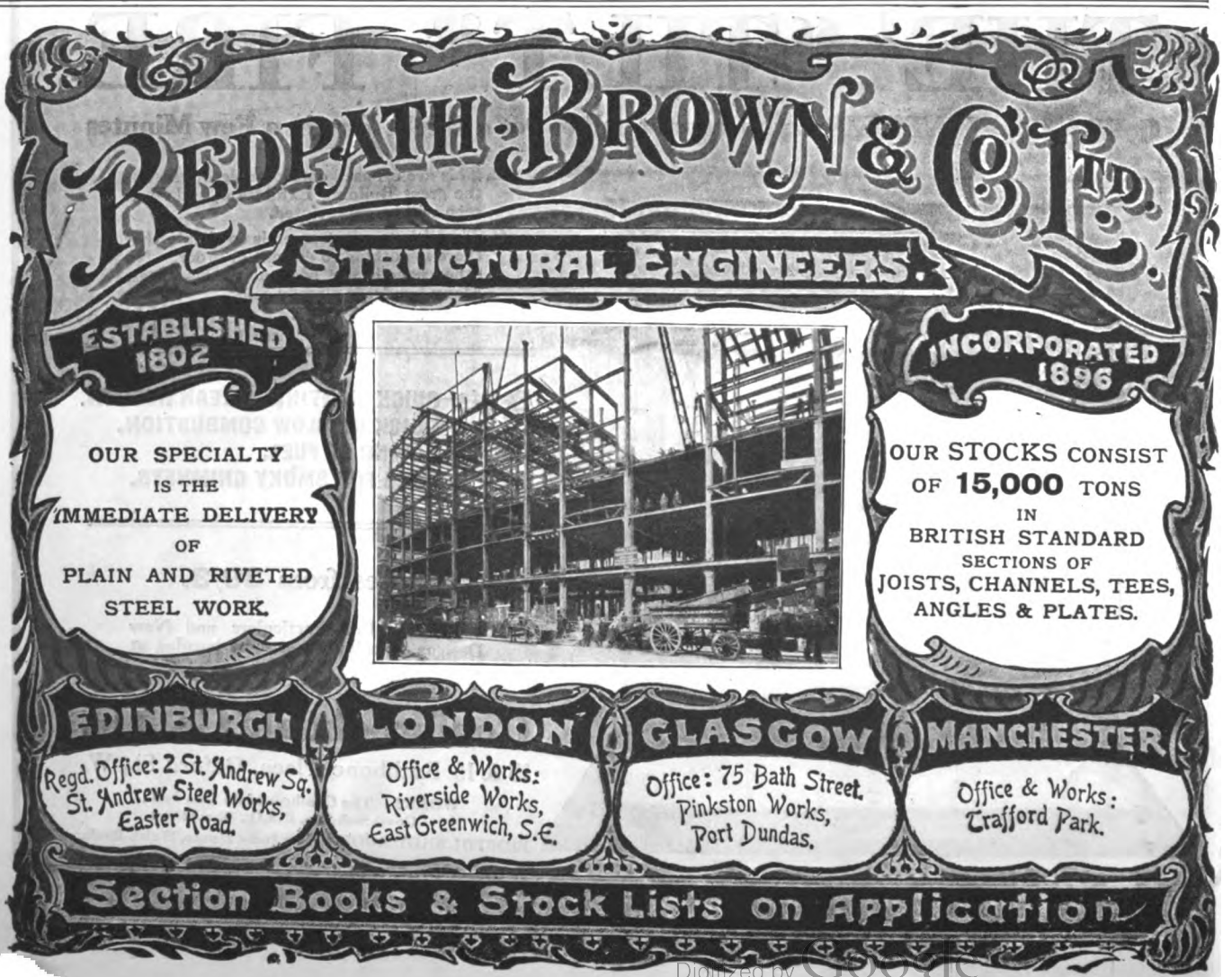
Williams, Pearl Street, Cardiff	£1,600	0	0

For the erection of a new higher elementary school at Bargoed, Glamorgan, for the Glamorgan County Council. Mr. D. Pugh-Jones, F.S.I., county architect. Quantities by the County Architect.

Howells, Caerphilly, Glamorgan	£7,919	16	2

For erection of new laboratories at the Penarth Intermediate Schools, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., county architect. Quantities by the County Architect.

Davies & Howell, Morgan Arcade Chambers, Cardiff	£4,169	0	0



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ILLUSTRATIONS.

BIRMINGHAM UNIVERSITY.—ENTRANCE—DETAIL OF ENTRANCE—TESTING LABORATORY—ELECTRICAL LABORATORY—DRAWING STUDIO—A CORRIDOR.

BEACON WOOD, LICKEY HILLS, WORCESTERSHIRE.—ENTRANCE FRONT.

HOUSE ON THE LICKEY HILLS, WORCESTERSHIRE.—S.W. ELEVATION.

WATFORD.

For erection of new business premises in the Pinner Road, for the Watford Co-operative Society, Ltd. Mr. C. P. Ayres, architect, Watford.

G. & J. Waterman	£1,517	0	0
Tyler	1,450	0	0
Eames	1,450	0	0
Hyde & Co.	1,419	0	0
Ensor	1,417	0	0
Stone	1,400	0	0
Wiggs	1,383	0	0
Clifford & Gough	1,383	0	0
Jaggard	1,340	0	0
W. & D. Wilkins	1,325	0	0
A. E. & C. Saw	1,297	0	0
Clark Bros. (*accepted*)	1,187	0	0
Vertical damp course.			
Clark Bros. (*accepted*)	35	0	0

WHITTLESEY.

For erection of the Whittlesey Turves school, for the Isle of Ely education committee.

Gray	£1,441	0	0
Clarke & Son	1,307	0	0
Guttridge & Son	1,295	0	0
Brown	1,292	0	0
Duddington	1,270	0	0
Wilkinson & Son	1,222	0	0
Bridgefoot & Son	1,220	0	0
Rands & Son	1,195	0	0
Elworthy & Son, Wisbech (*accepted*)	1,125	0	0
Heath	1,117	0	0

WALTON-ON-THAMES.

For construction of road, Ashley Park, Walton-on-Thames, for Mr. E. A. Lundy. Messrs. Crickmay & Sons, surveyors, 13 Victoria Street, Westminster, S.W.

Roadway.

Vinter	£1,115	0	0
Free & Sons	981	9	0
E. & E. Iles	914	0	0
Bell & Sons	837	0	0
Watson	800	0	0
Ford	790	0	0
Potterton & Co.	789	0	0
Franks	785	0	0
Kavanagh & Co. (*accepted*)	743	0	0
Footways and grass verge.			
Kavanagh & Co. (*accepted*)	87	0	0

WORTHING.

For carrying out alterations and other works at the West Tarring infants' school.

Nadin	£190	12	0
Crane	168	11	0
Moat	149	5	0
Blaker, Worthing (*accepted*)	141	19	8

TRADE NOTES.

The new Nurses' Home at the Royal Alexandra Infirmary, Paisley, erected from the plans of Mr. T. Graham Abercrombie, Paisley, has been ventilated by means of Mackay's patent direct-acting ventilators, supplied by Cousland & Mackay, Glasgow, the sole makers.

Messrs. J. B. Joyce & Co., Whitchurch, Salop, have been favoured with the order for a very large clock for the head offices of the Refuge Assurance Company, Oxford Street, Manchester. It will show time upon four dials, each 12½ feet diameter, of a special design, and will be illuminated at night. The clock will contain all the best and most modern improvements.

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VARIETIES.

Littlehampton has decided to embark on a drainage scheme which will cost 15,000*l*. The Duke of Norfolk will contribute 4,000*l*. of that amount. The question has been under consideration for very many years.

At a Local Government Board inquiry in Sheffield last week the Corporation sought permission to borrow 8,538*l*. for sewerage works. It was stated that the amount would cover the reconstruction of about two and a half miles of rubble sewers in eighteen streets. In all fifty-three miles of these sewers have been abolished since 1898, and there are still sixty-six miles to convert.

The Staffordshire education committee have considered a question raised by the county medical officer as to the necessity of all windows in public elementary schools being made to open, and it was ultimately resolved that the architect be instructed to make provision in all future plans for sash windows to be constructed in school and class rooms, drill halls and corridors, so that every part may be opened. At the same meeting last week the architect's sketch plans for Wordsley, Lawnswood Road, proposed Council school were adopted, showing provision for 250 girls and 268 infants.

At the meeting of the London County Council on the 27th ult., there appeared upon the agenda paper a recommendation of the main drainage committee to the effect that the tender of Messrs. Shellabear & Son, Plymouth, amounting to 473,416*l*. for the construction of the southern low-level sewer from Deptford to Battersea be accepted. The Chairman of the committee (Mr. Easton), however, stated that the tender had been withdrawn, the reason given being that the contractor could not place his orders for cast-iron at the price anticipated. The estimate of the chief engineer in respect of the work was 480,000*l*., and it was urged by the Progressives that the work should be carried out by direct labour. On a division the committee's recommendations were referred back for reconsideration.

The borough accountant of South Shields has issued a financial statement with regard to the new municipal buildings. It shows that the expenditure up to the present time has been 49,727*l*. 5*s*. 5*d*. In addition there are estimated liabilities to be met, including 4,943*l*. to the contractors, 2,029*l*. for authorised extras, 1,773*l*. 17*s*. 3*d*. for day accounts claimed by the contractors, 4,300*l*. for furnishing, 4,000*l*. for laying out the forecourt, 850*l*. architects' commission, and other items making a total of 18,245*l*. 7*s*. 3*d*. A sum of 2,026*l*. 17*s*. 4*d*. is set down for contingencies which will make the total estimated cost 70,000*l*. As the council's borrowing powers for the buildings are only 60,000*l*., it is proposed to apply for additional powers to the extent of 10,000*l*., the sum by which the original amount has been exceeded.

The paving and highways committee of the Manchester Corporation in their annual report refer to an experiment they are making in some of the streets of the more thickly populated parts of the city. In certain streets in Ancoats, for example, the sett paving has been removed, and the carriage ways reformed and paved with granited rock asphalt laid on a concrete foundation. This gives a smooth and unbroken surface, from which liquids fall away at once to the gullies, and enable the pavements to be more easily swept and kept clean and sanitary. It is hoped that this type of carriageway pavement will be successful and suitable for the class of street in which it has been laid, and, if found so, further streets will probably be dealt with in a similar manner in the future. Then, with the increased use of motor vehicles and the consequent heavier loads carried and at higher speeds, stronger pavements have become necessary, and in consequence, during the year granite setts have been substituted for grit setts, &c., in fourteen streets.

The Comisión Provincial de Orense invite tenders for the construction of a provincial infirmary at Orense, Spain. The upset price is placed at 823,000 pesetas (about 29,400*l*.), 5 per cent. of which amount must be deposited provisionally to qualify any tender, to be increased to 10 per cent. by the successful tenderer, who will also be required to pay to the architect, Don Joaquin Rogi, the sum of 23,100 pesetas (about 800*l*.) by way of compensation for preparing the plans, and a further percentage for inspection during building operations. Tenders will, says the *Board of Trade Journal*, be opened on August 20, both at the Comisión Provincial de Orense, Orense, and at the Dirección General de Administración, Ministerio de la Gobernación, Madrid, to either of which addresses tenders in sealed envelopes should accordingly be sent. Local representation is necessary.

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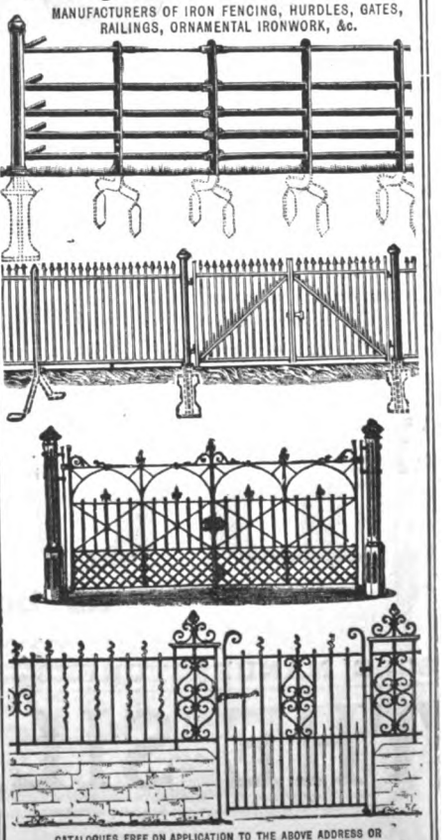
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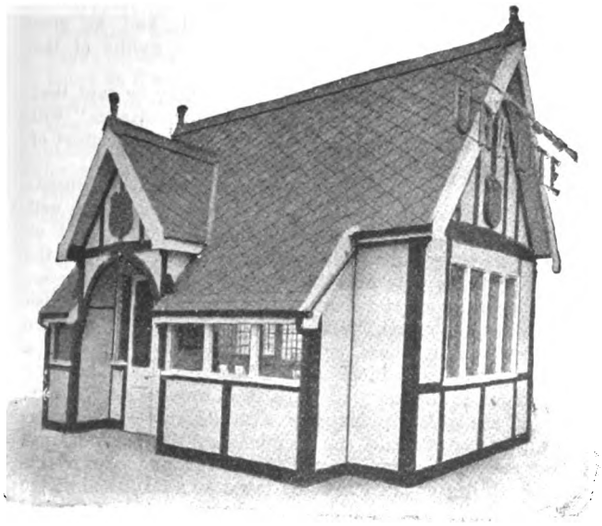
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June 8, 1909.
Gentlemen,—You will no doubt be pleased to hear that the "Sine Qua Non" Range we recently had from you is giving every satisfaction; we understand that the amount of coal consumed is practically one half of what the old range consumed.
We are, Gentlemen, yours faithfully,
(Signed for A. Eaton & Co., Ltd.,)
J. H. Stonehouse, Director.
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A URALITE PAVILION.

One of the useful as well as ornamental pavilions at the White City, Shepherd's Bush, is here illustrated. This Uralite Pavilion stands outside the Machinery Hall and can be seen from the cars which circle the grounds. Among its most striking features is the roof, which is covered with Asbestone 12 inches by 12 inches diagonal tiles. These tiles are neat in appearance, and are light, strong, durable, and cheap. It may be mentioned that the British Uralite Co. (1908), Ltd., who have put up the pavilion, have just completed delivery of 200,000 of these tiles for a large railway company in the Argentine. Asbestone is made also into sheets, 6 feet by 3 feet, for walls and partitions. The building admirably shows the adaptability of the British Uralite Co.'s manufactures for the construction of bungalows, &c. The walls are of coloured Asbestone sheets, nailed direct to the wood framework; the ceiling is constructed of Uralite sheets, part fixed direct to ceiling joists to form a plain flat ceiling, and the remainder fixed above the ceiling joists, thus obtaining the effect of an old-fashioned timbered ceiling. The roof is laid, as already stated, with Asbestone diagonal tiles on battens, with the exception of the dormer, which is covered with 12 inches by 8 inches Asbestone slates.

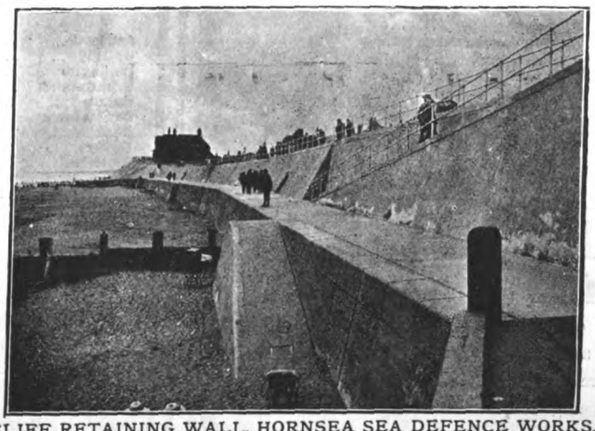


THE PAYMENT OF ARCHITECTS.

There are some useful lessons to be learnt from the case of Brown *v.* R. Mickel & Co., tried before Mr. Muir Mackenzie, the Official Referee, who gave judgment on July 31.

In this action Mr. D. Brown, an architect, of Baptist Church House, Southampton Row, London, sued Messrs. R. Mickel & Co., contractors, of Portland Court, Great Portland Street, London, and also of Glasgow, from whom he claimed 6,926*l.* 19*s.* 6*d.* balance alleged to be due in regard to professional services rendered in connection with the erection of a large block of flats in Portland Street, London. The defendants had paid 1,000*l.* into court, and counterclaimed for damages, alleging delay and negligence on the part of the plaintiff in connection with the work.

The Official Referee, in giving judgment, said that the real question in dispute was as to whether the plaintiff became entitled to a payment of 9,426*l.* 19*s.* as remuneration for his services as architect for the building of a large block of flats in Portland Street. The plaintiff had been paid, during the construction of the flats, 2,500*l.*, on account of his remuneration, and the present claim was for the balance. The defendants denied that the plaintiff in the circumstances was entitled to any remuneration in excess of 2,500*l.*, and had brought a counterclaim alleging negligence by the defendant in his duties as architect. They had also paid 1,000*l.* into court. Since the compromise, continued the Official Referee, of an action brought by the defendants against the plaintiff in May, 1907, the plaintiff had done nothing towards the supervision of a remainder of the buildings—which were ultimately completed—so far as the architectural work and supervision were concerned. Late in 1908 the plaintiff put forward his claim against the defendants. He had already received 2,500*l.*, but the claim he put forward was for 5 per cent. on the estimated

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cost of the building, 1,945*l.* 19*s.* 6*d.* for extra work, and 231*l.* for out-of-pocket expenses. It was significant that the work as described was not only the work of an architect, but also that of a surveyor, and the employment was to be as architect and surveyor for the purpose of the building. A great part of the work of the designing and planning had been done. It, therefore, appeared to him that in the circumstances the work was to be practically the whole of the work appertaining to an architect, and which would include various things which might be reasonably contemplated as having to be done. An architect, like everybody else, continued the Official Referee, could not recover for what was generally called "extra work" unless he made a contract by which he was to be paid for it, or unless the work was ordered and done in such circumstances that a contract to remunerate him for it, beyond what he had received in the ordinary course, could be employed. The plaintiff had not completed the work. Whether that were or were not his fault Mr. Mackenzie did not think it necessary to find. If it were his fault, he would be disentitled to further remuneration, but that ground had not been suggested by the defendants. The defendants suggested that plaintiff was to be paid remuneration of 5 per cent. on the cost of the work up to the time he ceased to do it, and that appeared to him to be the correct contention. Regarding the counterclaim, the defendants had alleged that the plaintiff had delayed unreasonably the preparation of the plans for the steelwork by which it was delayed. He (the Official Referee) thought there had been some delay, and delay which there should not have been; but he could not find, having regard to all the other matters going on, that that particular delay had caused the defendants any pecuniary loss which he could assess. It had been alleged, too, that there was neglect by the plaintiff as regarded certain plans. He confessed he did not think much of that particular claim, and he did not consider that under the circumstances the defendants would require any pecuniary indemnity in respect of the matter of complaint. On the whole, he thought that the fair decision to arrive at would be that the 1,000*l.* paid into court by the defendants was a fair and reasonable further remuneration to pay to the plaintiff, and that the latter was not entitled to anything more. There would, therefore, be judgment for the defendants in the action, because they had succeeded on the issue going to the whole cause of action. He ordered that the 1,000*l.* paid into court by the defendants should be paid out to the plaintiff. The defendants would have the general costs of the action and counterclaim after the date of the payment into court. The plaintiff would have his costs of action up to the date of the payment into court. The two sets of court would be set off one against the other.

CONTINENTAL TOWN PLANNING.

The official report of the Continental Town Planning Tour, arranged by the National Housing Reform Council for last Easter has now been published, and we give the following abstract as summarising the results of the tour:—

Coming to the lessons of the tour, it may be said that "Germany for town planning, England for cottages," will probably be the verdict of the majority of the members of the party in regard to the lessons of the tour.

Two sets of workmen's dwellings were visited—at Düsseldorf and Frankfort respectively. These dwellings are well designed and without doubt reach the high-water mark of German endeavour to provide dwellings for workmen on the tenement system. The building cost per room is, however, quite 50 per cent. greater than that of rooms in the English cottage, and as a result the rents charged per room compare unfavourably with those charged in English cities of a similar size to Düsseldorf and Frankfort. The building regulations as to thickness of walls seem unnecessarily severe, even when the greater rigour of a mid-European winter is taken into account; and the members of the party learned with interest of a strong movement in favour of the relaxation of building construction by-laws. At Düsseldorf the cost of land for the dwellings of the admirably organised Düsseldorf Spa-und-Bauverein was 17*s.* 6*d.* per square metre, and this was considered cheap. The cost of making streets (including canalisation) 6*l.* per metre frontage, and the building cost per room varies from 86*l.* to 91*l.*

The cost of land was found to be very heavy on the borders of all the cities visited, and this fact called for



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special inquiry and discussion. It was found that during the past thirty years the great facilities given for the sale and purchase of land, the cheapness of methods of transfer and mortgage, &c., had resulted in much land speculation, and a great inflation of land values. Endeavours had been made to check this speculation, but so far with only partial success. Many towns had adopted a system of taxing increments in land values whenever sales of land took place.

The willingness of the German people, rich and poor alike, to live in block dwellings had rendered it possible for owners of building sites to demand far higher prices for land needed for housing purposes than could possibly be obtained in Great Britain.

The value of municipal ownership of land as a means of increasing municipal revenue seems to be recognised on all hands in Germany. The most striking example of this was found at Frankfort. The enterprising Municipal Council of this city expended 1,200,000*l.* on the purchase of an enormous area of land on the east side of the city, and then proceeded to carefully plan and thoroughly carry out not only a scheme for a new river harbour, but for what is practically a new industrial town, with factory sites, proper railway communication, public parks, and workmen's cottages.

The special lesson of the tour is without doubt exemplified in this wonderful Frankfort example of municipal foresight. The first and last word in municipal administration in Germany would seem to be "thorough." In the preparation of a town plan no detail seems to be forgotten. If the prevailing winds are from the west, then the factories are placed on the eastern side of the town. Special care is given to the modern equivalents of the old city gates, the central railway stations. These are, without exception, imposing structures, and not, as in so many cases in England, unlovely aggregations of grimy buildings approached through a series of squalid streets. Money is spent lavishly on open spaces and public parks. The art of architecture is deliberately encouraged, and the consequent rivalry among architects has already produced many styles of architecture which, though possibly belonging only to a transition period, bear witness to the keen determination to produce new developments.

It is possible that in the desire to give special attention to what may be called town planning of the monumental kind, German town planners have gone to extremes. That this is so was clearly shown in the address given by Beigordneter Rehorst at Cologne. A new school of town planning experts is, however, being gradually developed, and many of the faults of the earlier methods are being corrected.

The enthusiasm for municipal progress and the absolute belief in a great municipal future which animates German officials and councillors, provide both an inspiration and an example for British councillors and officials.

The task confronting housing reformers in Great Britain is a great one, but given the same spirit of municipal enthusiasm and the same belief in the future of our centres of national life, then the task can be accomplished.

Our town planning developments will without doubt differ in one vital matter from the town planning developments of Germany. The unit of our planning will be the cottage with its home garden, and not the block with its central playground. It may well be that we shall in this way combine the best that England can show, and thus render our German neighbours a service in return. Meanwhile we owe them a deep debt of municipal gratitude for many striking examples of civic earnestness and enthusiasm.

In September, 1909, a second Continental Town Planning Tour will be made, under the auspices of the Council. Four towns will be visited. These will include Ulm-on-the Danube and Munich. It is hoped that a French city will be included in the tour.

Membership of the party will, as in the case of the Easter tour, be limited to municipal councillors and officials, architects and surveyors, and members of the National Housing Reform Council.

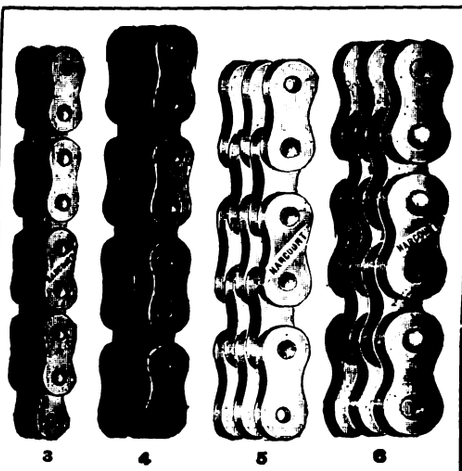
Further particulars of this tour will be sent to local authorities, and can be obtained on application to the Secretary, 18 Dulverton Road, Leicester.

THE Liverpool City Council have by fifty-three votes to twenty-seven rejected the housing committee's proposal to provide a municipal common lodging house for women at a capital expenditure of not exceeding 3,500*l.*, and an annual cost of maintenance of not exceeding 500*l.*

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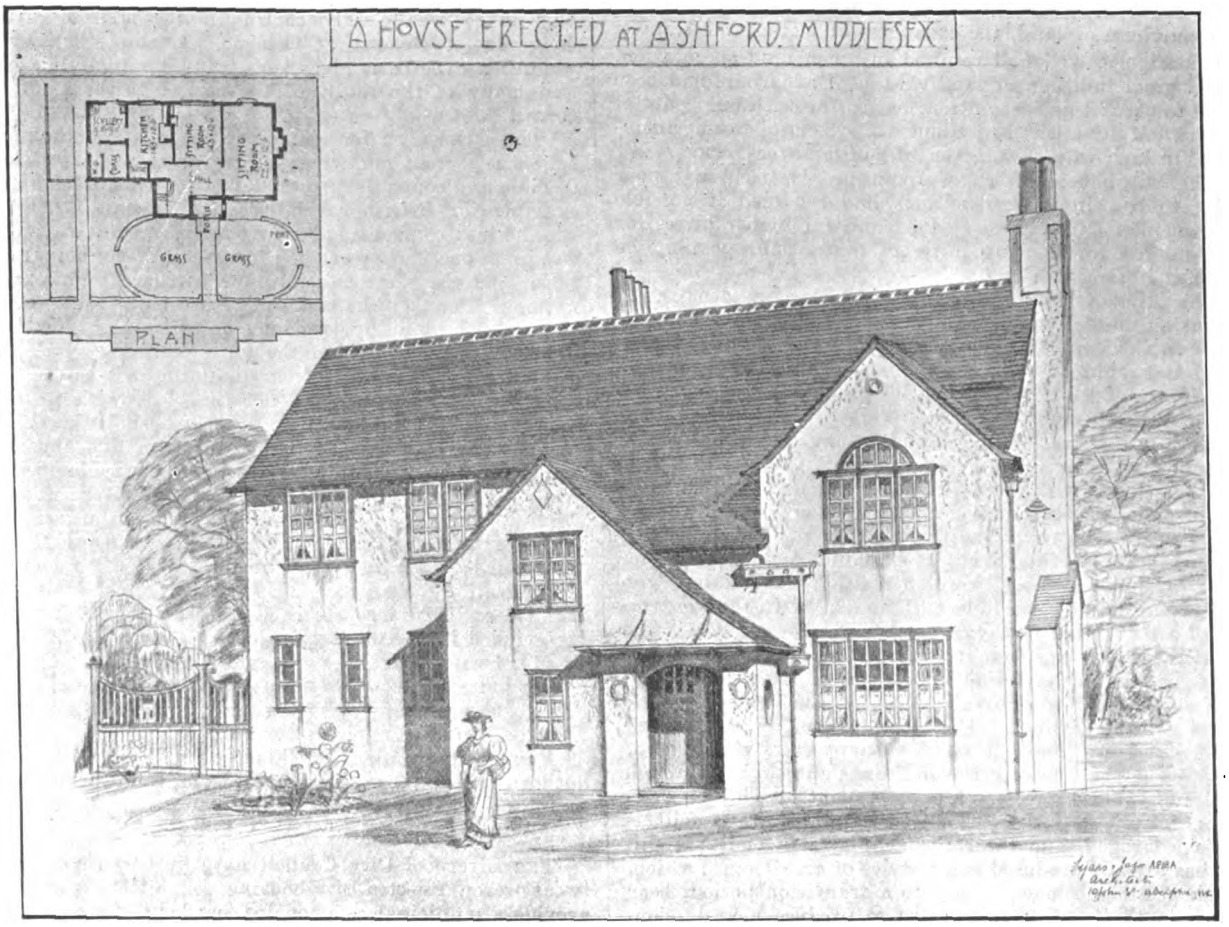
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BUILDERS' BENEVOLENT INSTITUTION.

The sixty-second annual general meeting of the Builders' Benevolent Institution was held at 31 and 32 Bedford Street, Strand, W.C., on Monday, July 26. The minutes of last annual meeting were read and approved; the appended annual report, the audited accounts, and the amended rules were read and approved. The following elections were made:—President, Mr. Howell J. Williams, J.P., L.C.C.; treasurer, Mr. J. Howard Colls; committee, re-elected: Mr. C. Ansell, Mr. W. Brass, Mr. T. Hall, Mr. B. Hannen, Mr. H. Arthur Bartlett, Mr. H. Holloway, J.P., Mr. J. Randall, Mr. W. Shepherd, Mr. T. Stirling; elected: Mr. J. W. Lorden, Mr. F. G. Rice, Mr. J. C. Nicholson. Votes of thanks were given to Mr. J. W. Lorden for his services as president during the past year, also to the hon. auditors (Mr. J. T. Bolding and Mr. R. J. Ward, F.C.A.), the trustees, vice-presidents, committee and dinner stewards.

The following was the amended report:—

The committee beg to submit their sixty-second annual report, and deeply regret that in consequence of the continued depression in the building and allied trades the funds at our disposal have decreased to such an extent that we have been obliged to sell out 500*l.* of stock to meet liabilities in the past year. The committee earnestly appeal for assistance in order to make provision for the many claims upon this charity.

We desire to register our hearty vote of thanks to Mrs. Richardson for her kind gift of 857*l.* in memory of her deceased husband. The money has been invested in the purchase of London and South-Western Railway Company Stock and the proceeds will be devoted to paying a female pensioner, approved by the committee, and nominated by Mrs. Richardson.

Attention is directed to the fact that the greatest economy is exercised in keeping down the administrative expenses. During the year three additions have been made to the pensioners' list, which now consists of twenty-nine men and twenty-seven women. Five male and five female pensioners have died during the last twelve months; the widows of the deceased male pensioners have been placed on the list after careful investigation of their claims. The committee desire to thank Mr. J. W. Lorden for his valuable services and kind contribution as president. Also the trustees (Mr. F. J. Dove, Sir Arthur C. Lucas, Bart., Mr. T. F. Rider, Mr. J. Howard Colls, Mr. T. Stirling and Mr. J. T. Bolding), the honorary auditors (Mr. J. T. Bolding and Mr. R. J. Ward, F.C.A.), and the dinner stewards.

Mr. Howell J. Williams, J.P., L.C.C., has kindly accepted the presidency for the coming year.

The annual dinner will be held on Thursday, November 25, 1909.

CANTON.

The city of Canton is the capital of the most southerly and also one of the largest and most densely populated provinces in China. The inhabitants number at a moderate estimate over 1,250,000 inhabitants, and are probably the wealthiest of any in the great cities of China. They are famous for their enterprise and business capacity, have spread all over the empire, and are to be found playing a leading part in all the Chinese communities of America, Australia and the Malay Peninsula. They have placed themselves in the van of the movement towards reform and constitutional government.

The Acting Consul-General, in his annual report, mentions many interesting facts about the development of the city.

Canton, after Peking the most famous of all the great cities of China, is contained within walls some six miles in circumference, and has extra mural suburbs—which form the chief business quarters of the city—stretching nearly five miles along the river bank.

Immediately adjacent to the south-western suburb of Canton lies the foreign settlement of Shameen, a small island not more than one and a quarter miles in circumference, which western enterprise, mainly British and French, has converted from an erstwhile barren mud flat into a miniature township, with rows of substantial residential and business buildings, intersected by shady avenues and public gardens and recreation grounds. The island is leased to the British and French Governments in perpetuity, two-thirds of the area being under British and one-third under French control.

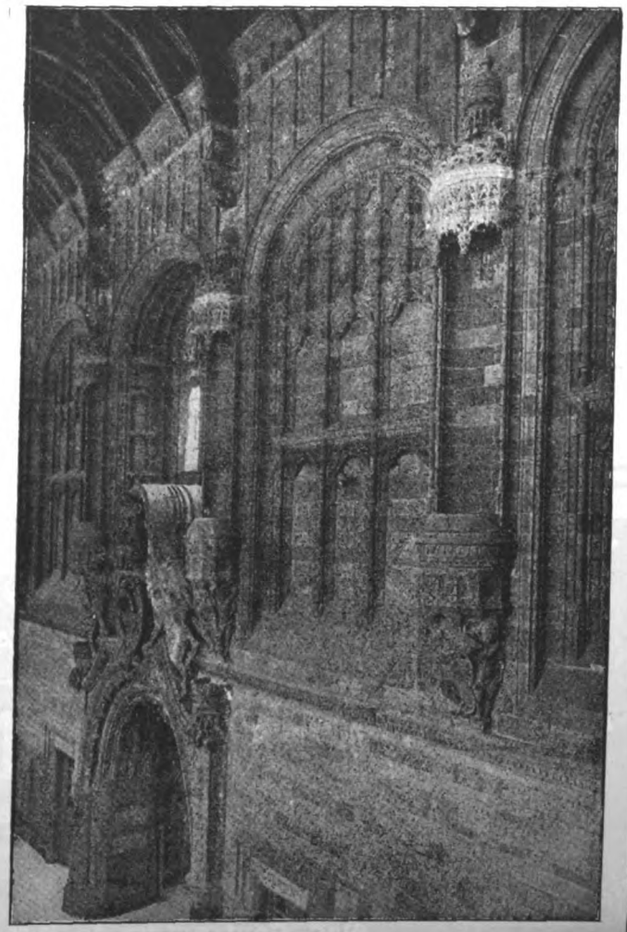
The number of foreign residents, which until ten years ago remained stationary at between 300 and 350, had in-

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creased in April 1909 to close on 1,350. The total foreign population of Canton is probably over 1,500.

But few lots on either concession now remain unbuilt on, and the value of land and house property has risen to such an extent that a lot on the British concession, measuring 12,645 square feet, which changed hands in 1885 for some 4,000 dols., was recently sold by public auction for 37,800 dols. (3,150*l.*). This works out to, say, 5*s.* per square foot.

It is dangerous to prophesy in the East, but everything seems to point to Shameen becoming more and more the business centre of Canton.

Among the more recently established factories and undertakings making use of labour-saving machinery, the following are commended to the notice of British manufacturers:—

The Canton Government Cement Works.—Built at a cost of 300,000 dols. Machinery, consisting of a main steam engine with three boilers (500 horse-power), elevators, grinding machines, drying plant, crushing machinery, &c., supplied at an additional cost of 320,000 dols.; estimated output per diem, 500 barrels of 400 lb. net each. These works are now in operation under German supervision, the management being Chinese. With special facilities for obtaining cheap limestone and cheap labour, and a growing demand for cement on railways and other works, they should, if capably managed, prove a paying concern.

Canton Waterworks.—These waterworks, built at a cost of 1,500,000 dols., under the supervision of a British engineer, were opened in August 1908. The machinery, all of British manufacture, is capable of supplying 6,000,000 gallons of water every twenty-four hours. The water, taken from the river a few miles above Canton, appears to be of good quality, and already some forty miles of piping have been laid down in the city and suburbs, from which water is supplied to over 10,000 subscribers. The waterworks are under Chinese management, no foreigners being employed.

Canton Electric Light Works.—These works, erected by the Chinese Light and Power Company of Hong-Kong, are situated at the South Gate. The plant is up to date in every detail, and, with the exception of an engine, is of British manufacture. It consists of three Diesel oil engines burning crude petroleum, the total brake-horse-power being 600; five steam engines, of a total brake-horse-power of 730; four Babcock-Wilcox water-tube boilers, burning Japanese coal; and one Green's economiser. Induced draught is used, Contraflo and Worthington condensers. The staff consists of two engineers, one mains superintendent, and 121 Chinese. Electric energy is supplied to Canton city and the foreign settlement of Shameen by means of overhead high-pressure mains, carried on iron and wooden poles. The primary pressure is 2,000 volts. The secondary or house-service pressure is 100 volts. The current is alternating. The supply on Shameen is continuous, that in the city being from sunset to sunrise.

Total number of eight-candle-power (equivalent) lamps connected (March 1, 1909), 26,510.

The British Consul remarks that lest any British firm should take the trouble to send out illustrated catalogues and circulars and make inquiries with regard to the openings for machinery above indicated, he would repeat that catalogues, more especially of railway material, are useless, and that the only way to obtain orders is to follow the German and American example and send out competent men, who will find out exactly what the Chinese want, tell them exactly what they can supply and for how much, and in short be prepared to exercise that patience, tact and business acumen without which in these days big orders are not obtained in China. British manufacturers are too often content to be represented by merchants in China, who, however willing they may be to push their wares, have not the time to devote to the business and are without the necessary expert knowledge. He is convinced that it is for this reason that so many large orders for railway material have, during the past year, gone to German and American firms.

Mr. William Plant, chief engineering assistant to the borough engineer and surveyor of Leicester, has been appointed borough engineer and surveyor at Stafford, at a salary of 275*l.* a year, rising by annual increments of 25*l.* to 400*l.* Mr. Plant was formerly engaged in the office of the borough surveyor of Stafford, Mr. Blackshaw, who is retiring after many years' service.

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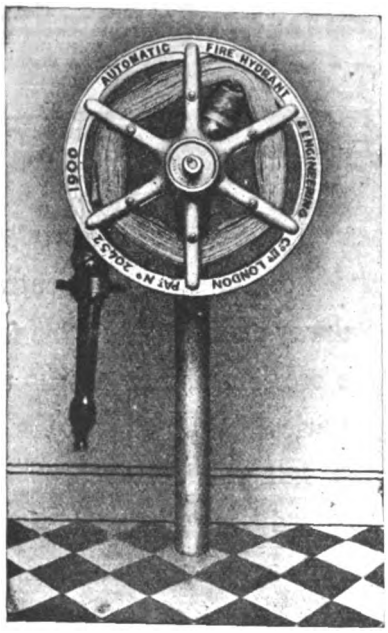
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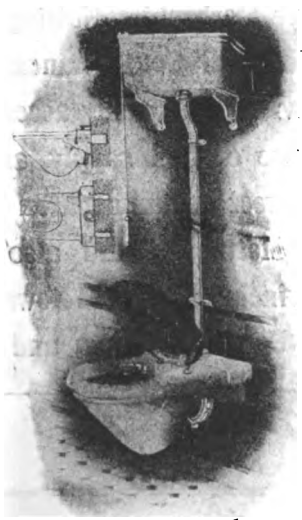
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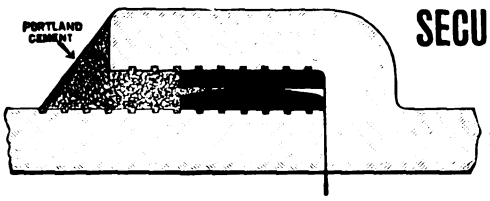
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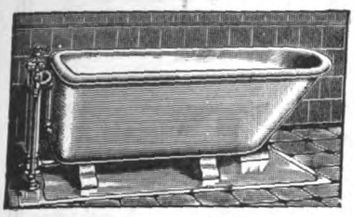
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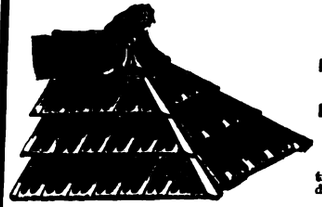
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Piscina in Triforium	February 18, 1898
Sedilia	February 25, 1898
North Aisle looking West	February 25, 1898
South Porch	March 4, 1898
View from North-East	March 4, 1898
South Aisle looking East	March 11, 1898
Chapel of St. Andrew, &c.	March 11, 1898
Nave looking West	March 18, 1898
Crypt	March 18, 1898
View in Cloisters	March 25, 1898
Doorway, &c.	March 25, 1898

ST. PAUL'S.

View in Nave, with Wellington Monument	April 1, 1898
Gate, North Choir Aisle	April 1, 1898
Nelson's Tomb	April 8, 1898
Triforium, &c.	April 8, 1898
Nave and North Transept	April 15, 1898
Roof, &c., looking East	April 22, 1898
Roof, &c., looking West	April 22, 1898
Apse, &c.	April 29, 1898
North-West Chapel	April 29, 1898
North-West Tower, &c.	May 6, 1898
Geometrical Staircase	May 6, 1898
West Window	May 13, 1898
Library	May 13, 1898
The Reredos	May 20, 1898

PETERBOROUGH.

View from North-West	June 3, 1898
Sanctuary	June 3, 1898
Towers, Pinnacles, &c.	June 10, 1898
Choir looking East	June 10, 1898
Ground Plan	June 10, 1898
Chapel of St. James	June 17, 1898
South Aisle, &c.	June 17, 1898
Vaulting, &c.	June 24, 1898
South Door (East)	June 24, 1898
South Door (West)	June 24, 1898
South Transept, &c.	July 1, 1898
Retro-choir (Roof)	July 1, 1898
View from Palace, &c.	July 8, 1898
Retro-choir	July 8, 1898
Details	July 8, 1898
East End	July 15, 1898
Triforium	July 15, 1898
Do.	July 22, 1898
View looking North-West	July 29, 1898
North Transept, &c.	July 29, 1898
Nave (North-West)	August 5, 1898
Old Cloister Wall	August 5, 1898
Cheese Moulding	August 5, 1898
Sanctuary, &c.	August 12, 1898
South Aisle (West)	August 12, 1898
Nave (East)	August 19, 1898
Doorway, &c.	August 19, 1898
Top of Central Gable	August 19, 1898
Choir and Nave (North-West)	August 26, 1898
West Front	September 2, 1898
West Front in 1827	September 2, 1898
West Front (Plans, &c.)	September 2, 1898

SOUTHWELL.

Ground Plan	September 9, 1898
View from North-West	September 9, 1898
Choir (West)	September 16, 1898
Choir (East)	September 23, 1898
Carvings, &c.	September 30, 1898
View from South-East	October 7, 1898
Distant View	October 14, 1898

ST. ALBANS.

View from South-West	October 21, 1898
Nave, &c.	October 28, 1898
West Front	November 4, 1898
Lady Chapel	November 11, 1898
Tower and South Transept	November 18, 1898
Behind Screen	November 18, 1898
Cloisters	November 25, 1898

ST. ALBANS—*continued.*

South Aisle, looking East	December 2, 1898
The Screen	December 9, 1898
The Screen (Details)	December 16, 1898
View from South-East	December 23, 1898
General View	December 30, 1898

DURHAM.

View from the Weir	January 6, 1899
Galilee (North)	January 6, 1899
Galilee, with Wall of Church	January 6, 1899
The Choir, looking West	January 13, 1899
Vaulting, &c.	January 13, 1899
Arcade, Chapter-house	January 13, 1899
West Tower from Cloister	January 20, 1899
Crypt under Dormitory	January 20, 1899
Triforium, &c.	January 20, 1899
View from Precincts	January 27, 1899
Galilee (South-East)	January 27, 1899
Vaulting of Chapel of Nine Altars	January 27, 1899
South Aisle, looking West	February 3, 1899
Entrance to Chapter-house	February 3, 1899
Galilee (North-East)	February 3, 1899
View from South-West	February 10, 1899
Lantern of Central Tower, &c.	February 10, 1899
Detail of Central Tower, &c.	February 10, 1899
North Transept	February 17, 1899
North Porch	February 17, 1899
West Door	February 17, 1899
Ground Plan	February 17, 1899
The Dun Cow	February 17, 1899
From St. Oswald's	February 24, 1899
Details, North Window, Chapel Nine Altars	February 24, 1899
Arcade, Inside Wall of Nave	February 24, 1899
Bishop's Throne	March 3, 1899
Chapel, Nine Altars (North)	March 3, 1899
Nave, looking East	March 10, 1899
North Porch	March 10, 1899
Galilee Doorway, West; North Aisle of Church	March 10, 1899
Choir looking East	March 17, 1899
Choir Vaulting looking West	March 17, 1899
East End South Choir Aisle, looking into Chapel of Nine Altars	March 24, 1899
South Aisle looking North, Transept	March 24, 1899
Entrance Crypt from Cloister	March 24, 1899
Galilee looking South-East	March 31, 1899
Altar of Lady of Pity	March 31, 1899
Nave, looking West	April 7, 1899
Looking Across Nave	April 7, 1899
Sedilia, &c.	April 14, 1899
Triforium Bay of Choir, North Side	April 14, 1899
North Aisle from Chapel of Nine Altars	April 21, 1899
West End of North Aisle	April 21, 1899
From Landing Stage	April 28, 1899
Ancient Font, with Canopy	May 5, 1899
Chapter-House (East)	May 12, 1899
Arcade, Central Tower	May 12, 1899
Detail of Capital	May 12, 1899
Cathedral Church	May 12, 1899

ST. ALBANS.

Doorway, South Transept	May 26, 1899
Doorway in South Aisle	May 26, 1899
Virgin and Child at Back of Reredos	May 26, 1899
The Watch Gallery	May 26, 1899

ROCHESTER.

View from Castle	June 2, 1899
Nave and North Transept	June 2, 1899
The Choir	June 9, 1899
Nave looking West	June 16, 1899
Doorway, South Choir Transept	June 16, 1899
Details, West Doorway	June 16, 1899
Plan	June 23, 1899
The Screen	June 23, 1899
The Crypt	June 23, 1899
Entrance to Crypt and South Choir Transept	June 23, 1899
Looking South-West	June 30, 1899
Nave Arches	June 30, 1899
The Triforium	June 30, 1899
East End of Choir	June 30, 1899
Western Turrets	June 30 1899

BRISTOL.

Exterior looking South-East, with Gatehouse	July 7, 1899
Exterior looking South-West	July 14, 1899
looking North-West	July 14, 1899
Exterior looking North-West	July 21, 1899
South Aisle looking East	July 28, 1899
Nave looking East	August 4, 1899
Arcade, Elder Lady Chapel	August 11, 1899
South Choir Aisle showing Roof	August 11, 1899
Exterior looking South-East	August 18, 1899
Choir looking East	August 18, 1899
Elder Lady Chapel looking East	August 25, 1899
Door from Cloisters into South Transept	August 25, 1899
Plan	August 25, 1899
Entrance, Berkeley Chapel, in South Aisle	September 1, 1899
Roof in Vestibule to Berkeley Chapel	September 1, 1899
Retro-choir looking East	September 8, 1899
Door from South Aisle to Retro-choir	September 8, 1899
Retro-choir, Altar and Sedilia	September 15, 1899
Carving on Berkeley Tomb	September 15, 1899
Entrance to Chapter-house	September 22, 1899
Chapter-house	September 29, 1899
Details Chapter-house	September 29, 1899

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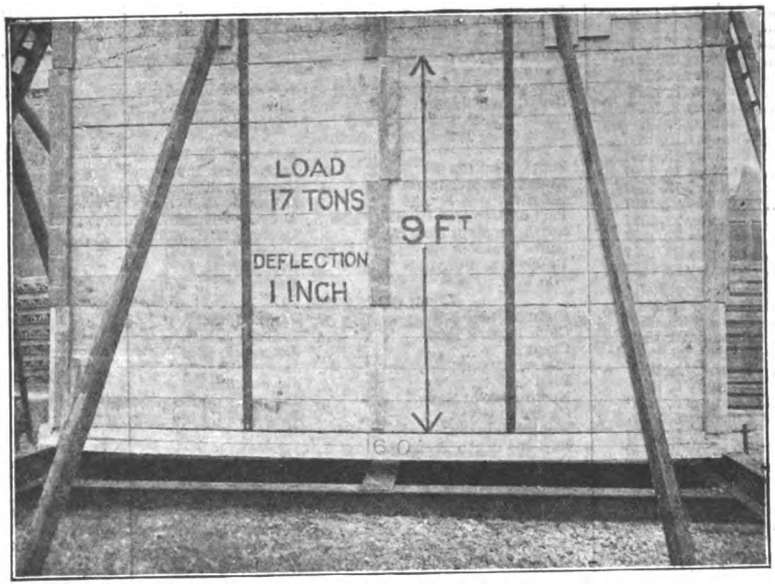
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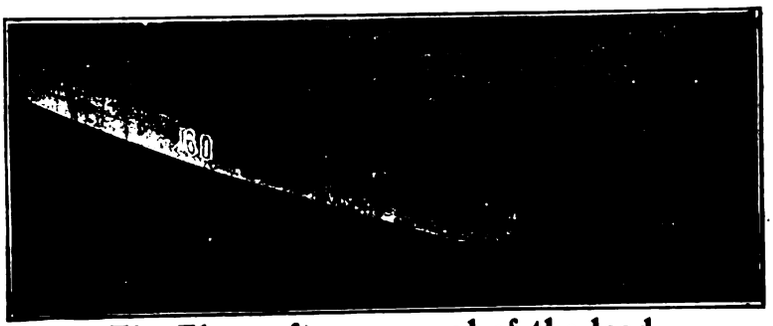
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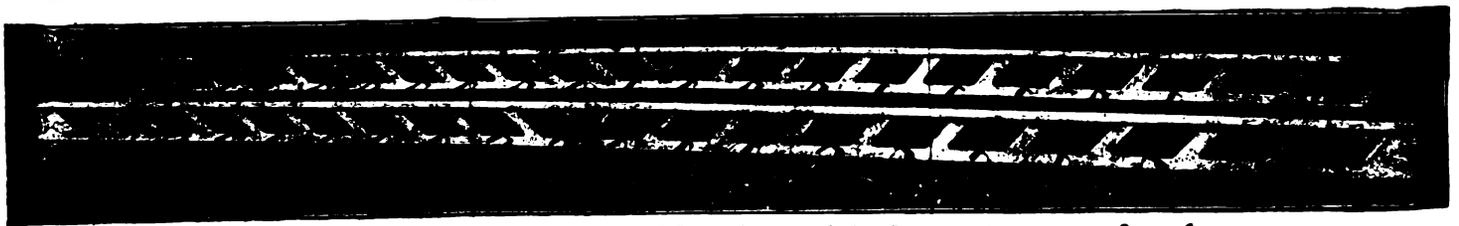
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60
30
30
4·2(2·8
30
120
120

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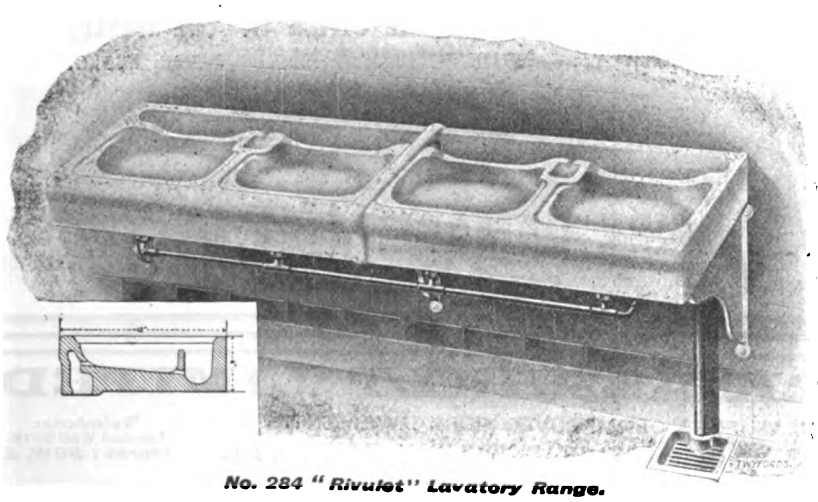
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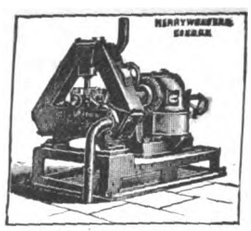
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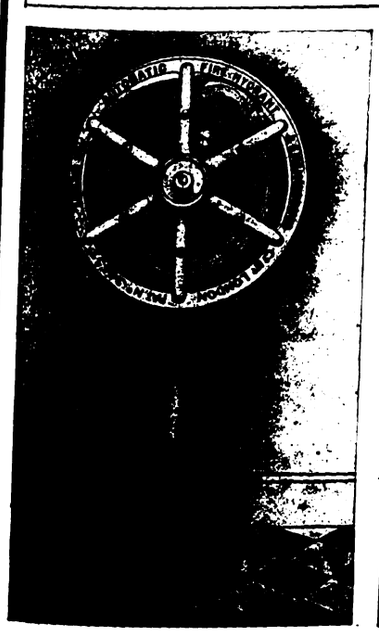
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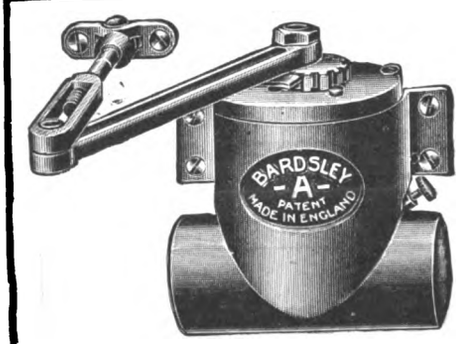
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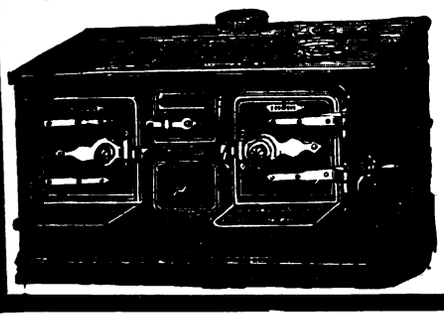
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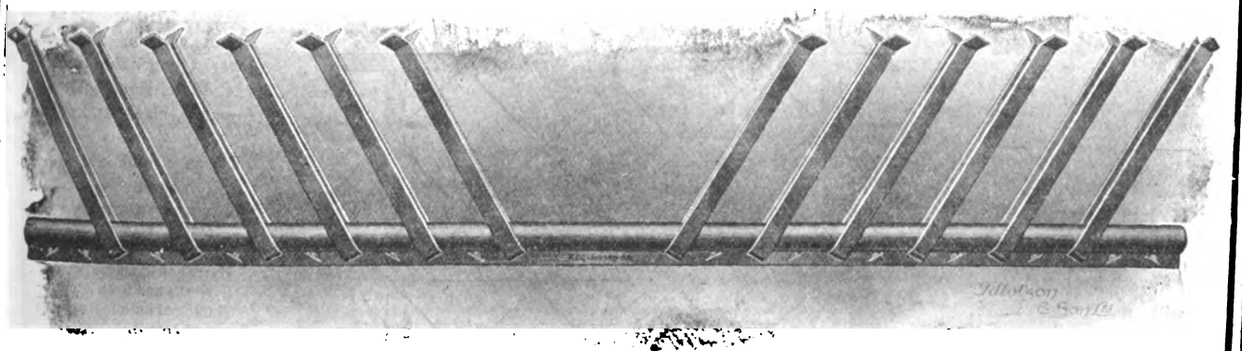
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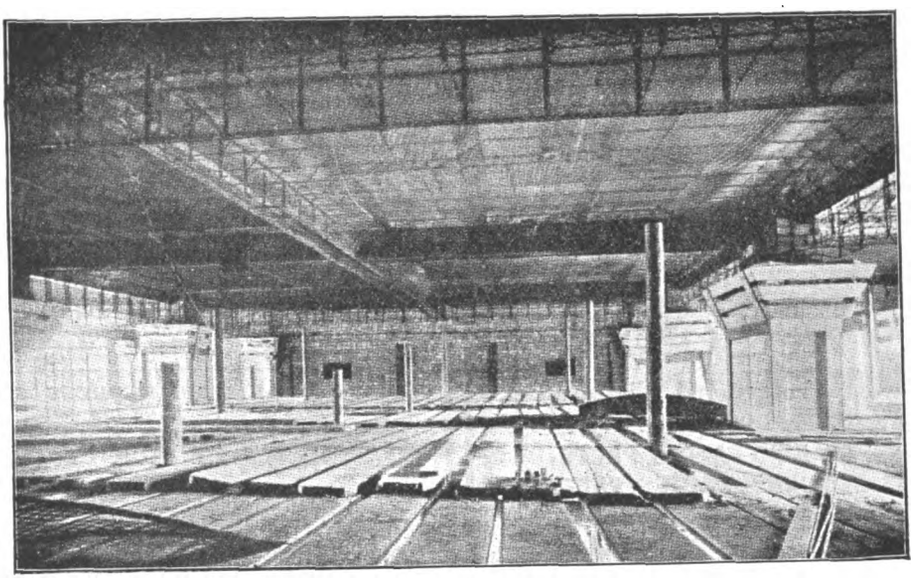
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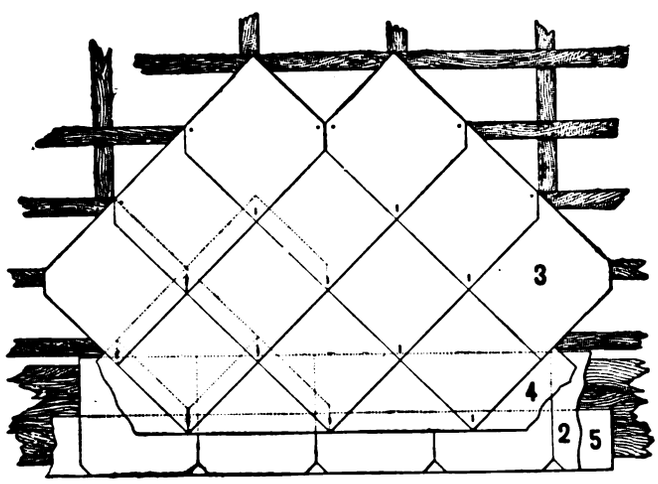
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THE

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

ANSWERS TO LEGAL QUERIES.

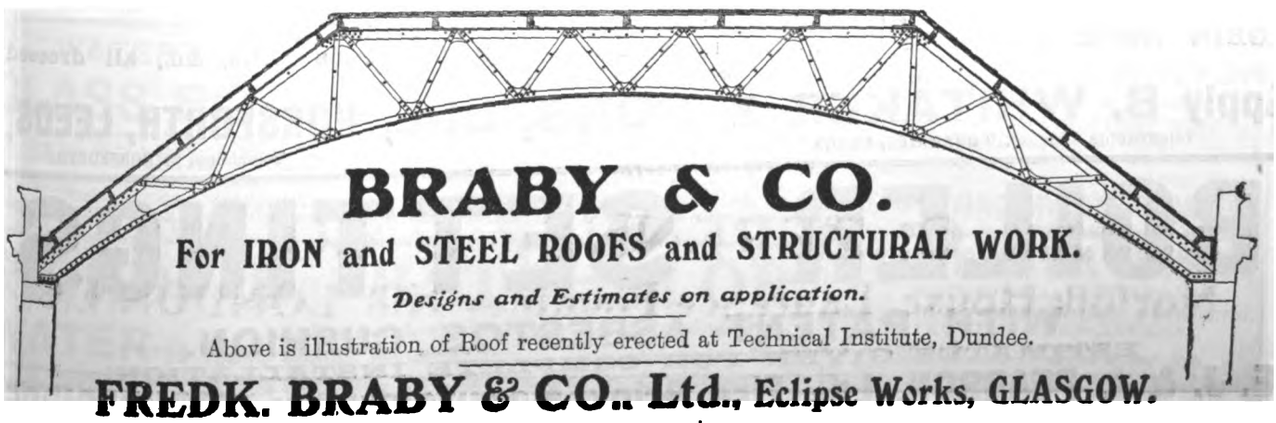
RECEIPT WITHOUT PREJUDICE (R.J.J.).—Your question is one of fact rather than of law. You have certainly not been treated fairly in accordance with the terms of the contract under which you have a clear claim for the full amount. Your letter of the 12th instant is somewhat ambiguous, but if you sued for the arrears due to you the Court would probably construe the letter in your favour, having regard to the circumstances of the case.

COMPETITIONS OPEN.

DEPTFORD.—Sept. 1.—The Metropolitan Borough Council of Deptford invite designs for a branch library at New Cross, S.E. Premiums of 50 guineas, 25 guineas and 10 guineas will be awarded. Assessor, Mr. J. S. Gibson, V.P.R.I.B.A. Deposit 1*l.* 1*s.* Competition is limited to architects practising in the city or county of London. Mr. Vivian Orchard, Town Clerk, Town Hall, New Cross Road, S.E.

FOREST HALL.—Aug. 30.—The Northumberland education committee invite designs from architects practising in Northumberland and Newcastle for an elementary school for 250 scholars. Mr. C. Williams, secretary, The Moothall, Newcastle-on-Tyne.

HUDDERSFIELD.—Aug. 31.—Plans are invited for a church to seat 400, to cost about 2,000*l.*, not to exceed 2,500*l.*, with all fittings, furnishings, lighting and heating apparatus. The Rev. D. Macrae Tod, B.D., St. James's Manse, Huddersfield.



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HULL.—Oct. 11.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l*., 100*l*. and 50*l*. Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l*. 1*s*. Mr. J. T. Riley, secretary of education, Albion Street, Hull.

NEWBURN.—Sept. 1.—The Newburn Urban District Council invite designs from architects practising in Newcastle-on-Tyne and Northumberland for new council chamber, offices and caretaker's house. The author of the best design will carry out the work; a premium of 10*l*. will be awarded to the second. Mr. R. J. Leeson (Messrs. Oliver, Leeson & Wood, architects), assessor. Deposit 1*l*. 1*s*. Mr. G. Wilkinson, clerk to the Council, Mosley Street, Newcastle-upon-Tyne.

WALES.—Oct. 1.—The Urban District Council of Aberdare invite competitive designs for a fever hospital for fifty-two patients, including administrative block, outbuildings, &c. Premiums of 100*l*., 50*l*. and 25*l*. An assessor will be appointed on the nomination of the President of the R.I.B.A. Deposit 3*l*. 3*s*. Mr. T. Phillips, clerk, Town Hall, Aberdare.

CONTRACTS OPEN.

AYLESBURY.—Aug. 27.—For erecting and completing stables, stores, sheds, &c., off Cambridge Street, for the Urban District Council. Deposit 2*l*. 2*s*. Mr. W. H. Taylor, engineer and surveyor to the council, Town Hall, Aylesbury.

BARROW-IN-FURNESS.—Aug. 21.—For the restoration of the stonework of the Town Hall buildings. The Borough Engineer's office, Town Hall.

BIRMINGHAM.—Aug. 24.—The Commissioners of His Majesty's Works and Public Buildings invite schemes and tenders based thereon for the reinforced concrete portions of the Birmingham Head Post Office. Any system or systems of construction may be adopted for the whole or any part of the work. Deposit 1*l*. 1*s*. Mr. J. Rutherford, the Board's architect, 17 Delahay Street, S.W.

BLUNDESTON.—Aug. 23.—For erection of a Wesleyan chapel, Blundeston, near Lowestoft. Mr. R. Scott Cockrill, A.R.I.B.A., Crossley House, London Road, Lowestoft.

BOWBURN.—Aug. 14.—For erection of a small Wesleyan Methodist chapel, &c., at Bowburn Colliery. Deposit 10*s*. 6*d*. Mr. J. Wilson Hays, architect, Wingate, co. Durham.

BRADFORD.—Aug. 30.—For all trades required in forming bathroom, dressing room and douche baths at the Bowling Back Lane school, for the Corporation. The City Architects, Whitaker Buildings, Brewery Street, Bradford.

BUTTERSHAW.—For erection of residence, Buttershaw, Yorks. Mr. Thos. L. Dixon, architect, surveyor, &c., Bowling Old Lane, Bradford, and Halifax Road, Buttershaw.

COLCHESTER.—For erection of a residence on the Lexden Park Estate. Deposit 2*l*. 2*s*. Mr. J. W. Start, F.S.I., architect and chartered surveyor, Colchester.

COLCHESTER.—Aug. 21.—For erection of new technical institute. Deposit 5*l*. Send names to Mr. H. A. Cheers, Twickenham, London.

CREDITON.—Sept. 6.—For building a secondary school for girls. Deposit 2*l*. 2*s*. Apply by Aug. 13 to the County Architect (Education), Richmond Road, Exeter.

CROMFORD.—Aug. 24.—For the widening of Lea County bridge, at Lea Mills, near Cromford, Derbyshire. The bridge is a stone arch of 16-feet span and is to be widened 10 feet. Mr. J. W. Horton, A.M.I.C.E., county surveyor, St. Mary's Gate, Derby.

DURHAM.—Aug. 16.—For erection of a girls' school at St. Hild's College. Deposit 1*l*. 1*s*. Messrs. Joseph Potts & Son, architects and surveyors, Sunderland..

DUBLIN.—Aug. 31.—For erection of an additional refuse destructor at the Depot, Stanley Street. Deposit 1*l*. 1*s*. Mr. Fred J. Allan, secretary, cleansing committee, 3 Cork Hill, Dublin.

EASTLEIGH (HANTS).—Aug. 23.—For the following contracts in connection with boys' and girls' elementary school, Eastleigh, 800 children. Contract No. 1:—Erection of a school of two floors to accommodate 800 children. Deposit 5*l*. 5*s*. Contract No. 2: For construction of about 900 square yards of Hennebique concrete flooring in the new school. Deposit 2*l*. 2*s*. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

ECCLES.—Aug. 21.—For erection of a secondary and technical school at Park Road, Monton. Deposit 3*l*. Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

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EDINBURGH.—Aug. 21.—For alterations and the addition of one storey to the Edinburgh General Post Office. Deposit 1*l.* 1*s.* His Majesty's Office of Works, Edinburgh.

FAREHAM.—Aug. 18.—For erection of a house. Messrs. Hall, Pain & Goldsmith, 48 West Street, Fareham.

HALIFAX.—Aug. 16.—For the mason, joiner, slater, plumber, iron and steel, and shafting works required in the erection of a weaving shed, about 72 yards by 24 yards. Messrs. W. G. Gray & Son, architects, 26 George Street, Halifax.

INGATESTONE (ESSEX).—Aug. 20.—For erection of two cottages for the Chelmsford Rural District Council. Mr. James Dewhirst, surveyor, Bank Chambers, New Street, Chelmsford.

IRELAND.—Aug. 18.—For building a schoolhouse at Birdstown, near Londonderry. Mr. J. S. M'Cay, solicitor, Londonderry.

IRELAND.—Aug. 14.—For the following works for the guardians of Boyle, viz.:—(1) Repairs of roof of the entire institution, including valleys, eave-gutters, and down pipes; (2) repairs and painting of all the external wood and ironwork including the iron railing in front of the workhouse; (3) providing a w.c. and lavatory accommodation in connection with the Board room; (4) colouring of the internal of the infirmary, including the nurses' room, also repairs of the nurses' room, and re-dashing of portion of the walls around the windows of the Fever Hospital. Deposit 1*l.* Mr. McDermott, engineer, Workhouse, Boyle.

IRELAND.—Aug. 17.—For all or any of the sections of the following works, for the Urban District Council:—Section No. 1, excavation and levelling of site; No. 2, building houses in blocks, consisting of: No. 3 (a) sixteen four-roomed houses; No. 4 (b) twenty-four three-roomed houses; No. 5 (c) thirty-four two and three-roomed houses; No. 6, laying down water mains; No. 7, laying sewers; No. 8, construction of roads, concrete footpaths, and fences. Deposit 1*l.* 1*s.* The Town Clerk's Office, Town Hall, Blackrock.

IRELAND.—Aug. 17.—For erection of a public library at junction of Florence Road and Eglinton Road, Bray. Deposit 2*l.* 2*s.* Mr. J. Charles Wilmot, C.E., 3 Lower Merrion Street, Dublin.

IRELAND.—Aug. 25.—For rebuilding branch bank and residence at Edenderry, for the Hibernian Bank, Ltd. Deposit 2*l.* 2*s.* Mr. William Butler, surveyor, 58 Mountjoy Square, Dublin.

KEIGHLEY.—Aug. 27.—For the enlargement of the head post office. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

LONDON.—Aug. 19.—For the erection of receiving homes for children facing the Aldersbrook Road, Wanstead, for the Guardians of the West Ham Union. Deposit 10*l.* Send names by August 19 to Mr. William Jacques, A.R.I.B.A., 2 Fen Court, Fenchurch Street, E.C.

LONDON.—Aug. 19.—The Commissioners of H.M. Works and Public Buildings invite constructional schemes and tenders based thereon for erection in reinforced concrete of the new building for the Money Order Department of the Post Office at Manor Gardens, Holloway, N. Deposit 3*l.* 3*s.* Mr. J. Wager, A.R.I.B.A., M.C.I., at H.M. Office of Works, &c., Storey's Gate, S.W.

LONDON.—Aug. 31.—For erection of the Central London Recruiting Depot, Old Scotland Yard, S.W. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

LUDDENDEN.—Aug. 20.—For the excavator, mason and bricklayer, carpenter and joiner, plumber and glazier, slater and concreter works required in the extension to chancel at St. Mary's Church, Luddenden, near Halifax. Messrs. Joseph F. Walsh, F.S.I., & Graham Nicholas, F.R.I.B.A., architects and surveyors, Museum Chambers, Halifax.

LUDDENDEN.—Aug. 20.—For the various works required in the pulling down and rebuilding of warehouse and machine rooms at Dean Mills, Luddenden. Messrs. Joseph F. Walsh, F.S.I., & Graham Nicholas, F.R.I.B.A., architects and surveyors, Museum Chambers, Halifax.

LUTON.—Aug. 26.—The Town Council invite constructional schemes and tenders based thereon for reinforced concrete floors and a circular dome in connection with the new public library. The Borough Engineer's Office, Town Hall, Luton.

MILTON (CAMBS).—Aug. 21.—For erection of a house and buildings. Mr. H. H. Dunn, county architect, Central Chambers, Cambridge.

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Mullion.—Aug. 16.—For erection of the Polurrian Hotel, Mullion, Cornwall. Mr. Arthur Gilbert, architect, Treval, Torpoint.

Newcastle-upon-Tyne.—Aug. 16.—For the erection of a stone dwarf wall and ornamental iron railing at Lady Stephenson Library, Walker. The City Engineer's Office, Town Hall, Newcastle-upon-Tyne.

Northallerton.—Aug. 31.—For alterations and improvements to (1) Stanghow Lane School, Mr. J. H. Fletcher, school caretaker, 68 High Street, Skelton-in-Cleveland; (2) Stainton Council school, Mr. J. Jackson, school correspondent, Stainton, Thornaby-on-Tees; (3) Guisborough Northgate school, Mr. J. Grant, schoolmaster, Guisborough Northgate school.

Preston.—Aug. 21.—For taking down the existing buildings between the County Council offices in Fishergate Hill and the Constabulary Offices in Jordan Street, and erecting new offices on the site. Deposit 3*l*. Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Rawmarsh.—Aug. 19.—For the conversion of present premises into two dwellings, situate in Stocks Lane, Rawmarsh, Yorks., for the Congregational trustees. Mr. J. Platts, architect, High Street, Rotherham.

Scotland.—Aug. 19.—For the mason, carpenter, plumber, slater, plaster, painter, and iron work of higher grade school, Banff. Mr. Arthur Clyne, F.R.I.B.A., architect, 123½ Union Street, Aberdeen; or Mr. John A. Badenoch, clerk, School Board Office, Banff.

Scotland.—Aug. 20.—For the mason, carpenter, plumber, and iron works of additions and alterations at Grange Green Farm steading, Forres. Mr. P. Fulton, architect, Forres.

Shalford, near Guildford.—Aug. 17.—For carrying out some small repairs and painting work to the buildings and gateways in the cemetery. Mr. Edward L. Lunn, architect and surveyor, 36 High Street, Guildford.

Sheffield.—Aug. 18.—For erection of additional offices, mess-room and retaining wall at Lumley Street destructor. Deposit 1*l*. 1*s*. The City Engineer and Surveyor, Town Hall, Sheffield.

Stafford.—Aug. 21.—For erection and completion of a Council school for 520 children in Tenter Banks. Deposit 1*l*. 1*s*. Apply to Mr. Graham Balfour, director of education, County Education Offices, Stafford, by Aug. 21.

Swinton, Manchester.—For erection and completion of Wesleyan church at Swinton, near Rotherham. Mr. A. E. Lambert, architect, 22 Park Row, Nottingham.

Wakefield.—Aug. 20.—The West Riding education committee invite whole or separate tenders for the following works:—Garforth Provided school, additions, &c. (builder, joiner, slater, plasterer, plumber, painter); Wales new infants' school (builder, joiner, slater, plasterer, plumber, painter); Paythorne Provided school, asphalting (asphalter); Crigglestone Provided school, additions (builder, joiner, slater, plasterer, plumber, painter). Deposit 1*l*. each. The West Riding architect, County Hall, Wakefield.

Wales.—Aug. 16.—For alterations and additions to the Halfway House, Onllwyn, near Neath. Mr. W. T. Davies, architect, Ystradgynlais.

Wales.—Aug. 16.—For erection of two semi-detached villas at Abernant Road, Aberdare. Mr. T. Roderick, architect, Clifton Street, Aberdare.

Wales.—Aug. 17.—For erection of a parish hall at New Tredegar, Mon. Mr. Geo. Kenshole, M.S.A., architect and surveyor, Station Road, Bargoed.

Wales.—Aug. 18.—For alterations and additions to their premises in High Street, Cymmer, Porth. Deposit 1*l*. 1*s*. The Secretary, the Cymmer Working Men's Club, Porth.

Wales.—Aug. 19.—For certain alterations to the Church Hall, Cadoxton-Barry. Mr. G. E. Halliday, F.R.I.B.A., 19 Castle Street, Cardiff.

Wales.—Aug. 20.—For erection of sixty houses, more or less, for the Willow Town Building Club, Ebbw Vale. Mr. T. G. Jones, 21 Eureka Place, Ebbw Vale, or Mr. T. E. Rogers, architect, Brynfryd Terrace, Waunllwyd, Mon.

Wales.—Aug. 20.—For the enlargement of St. Paul's church, Porth. Mr. G. E. Halliday, F.R.I.B.A., diocesan surveyor, 19 Castle Street, Cardiff.

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Wales.—Aug. 21.—For building a church at Goodwick, S.O., Pembrokeshire. Deposit 2*l.* 2*s.* Mr. E. M. Bruce Vaughan, F.R.I.B.A., architect, Cardiff.

Wales.—Aug. 30.—For erection and completion of forty-five houses and formation of road, surface-water drains, &c., at Chepstow Road, Pencelli, Treorky, Rhondda Valley, for the Pencelli Building Club. Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre.

Wales.—Aug. 21.—For extensions and alterations to the Pontywaun county secondary school, Monmouthshire. Mr. R. L. Roberts, architect, Abercarn.

Wales.—Aug. 20.—For the erection and completion of a minister's house at Canning Street extension, Ton Pentre. Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre, Rhondda.

Whitehaven.—Aug. 17.—For erection of steam laundry on the Low Road, Whitehaven. Messrs. J. S. Moffat & Bentley, architects, 53 Church Street, Whitehaven.

Winchester.—Aug. 19.—For new servants' hall, kitchener and rearrangement of hot-water service, with other work, Chief Constable's house, Winchester. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

Wordsley.—Aug. 14.—For erection of a Council school for 418 children at Wordsley, near Stourbridge. Deposit 1*l.* 1*s.* Apply by August 14 to Mr. Graham Balfour, director of education, County Education Offices, Stafford.

Wrexham.—Aug. 24.—For the construction of a convenience on land off Town Hill, and also the removal from Brook Street of an iron convenience and its re-erection in Tenter's Square. Separate tenders. Mr. John England, borough engineer, Willow Road, Wrexham.

Yarmouth, Isle of Wight.—Aug. 16.—For repairs to the pier, for the Town Trust, Yarmouth, I.W. Messrs. Newman & Cocks, surveyors, Ryde.

The late Mr. Henry Stock (84), of Clovelly, Sandown, Isle of Wight, architect and surveyor, county surveyor and architect for Essex for forty-three years, formerly of Messrs. Stock, Page & Stock, Denman Street, S.E., left estate valued at 26,569*l.*

TENDERS.

ASPULL, NEAR WIGAN.

For building the new Council school for the Education Authority.

Johnson & Son, Wigan (*accepted*) . .	£3,340 0 0

BARKING TOWN.

For private street works at Devon and Sparsholt Roads, for the Urban District Council. Mr. C. F. Dawson, surveyor, public offices, Barking.

	Devon Road.	Sparsholt Road.
Pethick Bros. . . .	£475 0 0	£1,178 0 0
Anderson	398 4 6	973 3 2
Parsons & Parsons . .	385 9 5	944 14 10
Wilson, Border & Co. . .	380 5 11	933 15 3
Wilson	380 0 0	920 0 0
E. & E. Iles	368 0 0	906 5 0
Glenny, Romford (*accepted*)	366 4 11	869 14 3

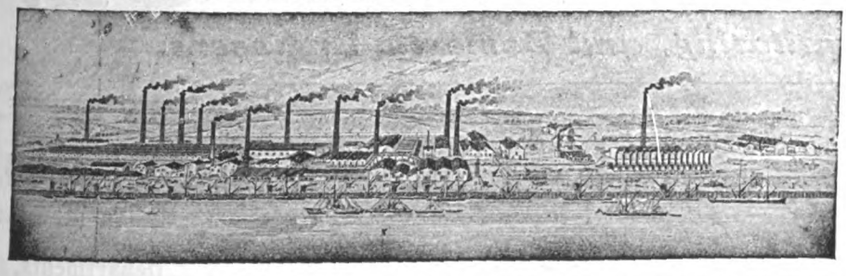
CHARD.

For carrying out a drainage scheme for the Town Council.

Taylor	£7,921 6 3
Shaddock	7,390 17 9
J. & T. Binns	6,651 19 8
Ireland	6,208 6 7
Crockerell	6,183 2 6
H. W. Pollard & Son	6,104 8 11
Osenton	5,969 15 5
Small	5,669 8 10
Pethick Bros.	5,721 0 0
Brebner	5,681 14 6
Bell & Sons	5,410 10 8
Bryer, jun.	5,366 11 4
Pollard & Co.	5,335 7 ?
Chamberlain	5,300 0 0
Moran & Sons	5,300 0 0
Coles	5,178 14 6
Byard & Sons	5,068 16 1
Pomeroy	4,927 5 8
Steel & Pearce, Plymouth (*accepted*) .	4,783 3 6

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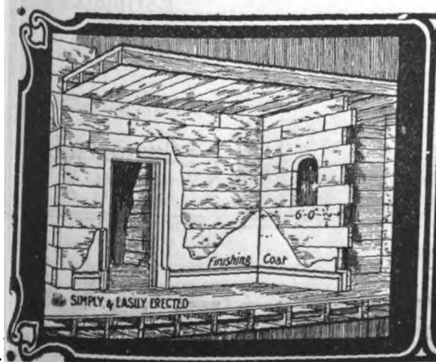
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DUNFERMLINE.

For the erection of a building in connection with the Lauder technical school for weaving and engineering classes. Messrs. H. & D. Barclay, architects, Glasgow.

Accepted tenders.

Clark, mason	£2,671 1 6
Westwood, joiner	1,891 16 10
Linn Bros., plaster	439 15 10
Inglis & Son, plumber	387 10 0
Munro & Co., electric lighting	258 13 10
Taylor & Fraser, heating	217 15 1
Robertson, slater	93 6 0
Loch, asphalte work	79 0 0

EAST HAM.

For erecting school buildings to accommodate 1,032 children, Vicarage Lane, for the education committee. Mr. R. L. Curtis, architect, 11 and 12 Finsbury Square, E.C.

Maddison, Clarkson Street, Canning Town (*accepted*)	£13,229 0 0

GRIMSBY.

For erection of public convenience, Oxford Street. Mr. H. Gilbert Whyatt, A.M.I.C.E., borough engineer and surveyor.

Parker & Son	£369 0 0
Waterman	355 0 0
Hewins & Goodhand	335 0 0
Edwards & Raynor	331 1 1
Emerson Bros.	326 9 1
Gilbert	320 16 6
Kitching	317 0 0
Holmes & Richardson	313 0 0
Kirton, Grimsby (*accepted*)	299 1 0

For alterations to 69 Cleethorpe Road. Mr. H. Gilbert Whyatt, A.M.I.C.E., borough engineer and surveyor.

Emerson Bros., Grimsby (*accepted*)	£199 7 0

For the extension of Corporation water mains.

Sangwin, Grimsby (*accepted*)	£68 15 8

HARROGATE.

For additions and alterations to the United Methodist church and schools. Mr. W. Hugill Dinsley, architect, Chorley, Lancs.

Accepted tenders.

Simpson & Sons, mason	£695 0 0
Rudd, joiner	260 0 0
Foster, plumber	118 0 0
Calverley & Sons, plasterer	115 10 2
Shepherd, slater	51 0 0

All of Harrogate.

HOMERTON.

For additional accommodation for male staff at the Eastern Fever Hospital, Homerton Grove, for the Metropolitan Asylums Board. Mr. W. T. Hatch, M.Inst.C.E., engineer-in-chief.

Silk & Son	£2,713 0 0
Gathercole Bros.	2,682 4 1
Weibking & Co.	2,590 0 0
Richards & Co.	2,499 0 0
Pattinson & Sons	2,324 0 0
Woolaston & Co.	2,300 0 0
Kazak	2,291 0 0
Lawrence & Son	2,288 0 0
F. & A. Willmott	2,287 0 0
Nightingale	2,265 10 0
Fryer & Co.	2,264 0 0
Shurmur & Sons	2,232 0 0
Webster & Son	2,199 0 0
F. & G. Foster	2,110 0 0
Pasterfield & English, Streatham (*accepted*)	2,058 0 0

KINGSTON.

For Kingston skating rink, Penrhyn Road. Mr. Alfred Mason, architect and surveyor, Surbiton.

Watt	£4,500 0 0
Lewis Bros.	3,804 0 0
Rice & Sons	3,693 0 0
Minter	3,589 0 0
McC. Fitt	3,575 0 0

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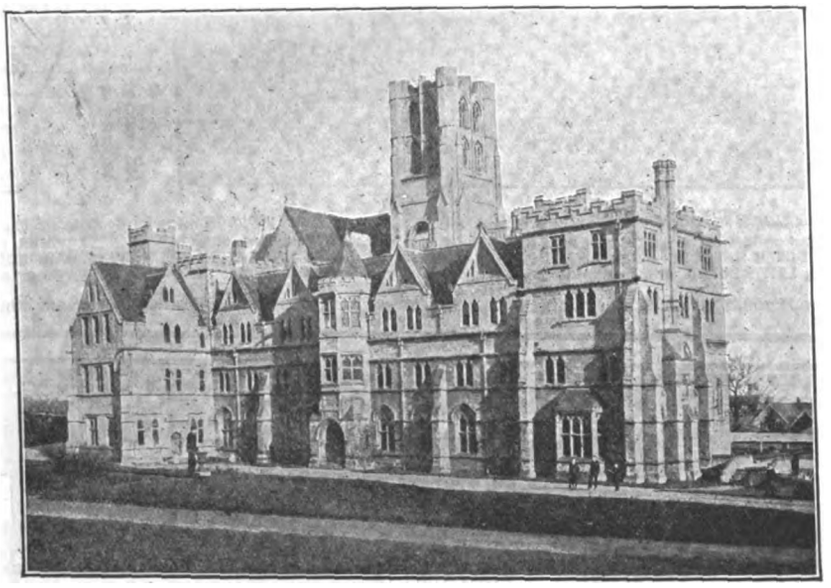
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KINGSTON—*continued.*

Irwin	3,527	0	0
Watson	3,479	0	0
Oldridge & Sons	3,463	0	0
Sheffield Bros.	3,463	0	0
Hawkey	3,425	0	0
Nightingale	3,270	0	0
Collinson & Co.	3,217	0	0
Dorey & Co.	3,212	0	0
Limpus & Sons, Surbiton and Kingston (*accepted*)	3,167	0	0

LONDON.

For constructing new sewers in Chancery Lane and Little Bath Street, for the Holborn Borough Council.

Adams	£3,100	0	0
Parry & Co.	2,930	0	0
Killingback & Co.	2,779	0	0
Paterson, Camden Town (*accepted*)	2,404	0	0
Borough surveyor's estimate	2,680	0	0

For erection of disinfecting station, residences, &c., at Grosvenor Canal, for the Westminster City Council.

	Disinfecting Station.			Residences.		
Mowlem & Co.	£6,141	0	0	£6,380	0	0
Bywaters & Sons	5,580	0	0	5,697	0	0
Foster & Dicksee	5,438	0	0	5,898	0	0
Holland & Hannen	5,400	0	0	5,729	0	0
Minter	5,358	0	0	5,393	0	0
Hall, Beddall & Co.	5,350	0	0	5,514	0	0
Howard & Co.	5,318	0	0	5,489	0	0
Higgs & Hill	5,283	0	0	5,514	0	0
Holloway Bros.	5,270	0	0	5,500	0	0
Spencer, Santo & Co.	5,200	0	0	5,250	0	0
Patman & Fotheringham	5,186	0	0	5,220	0	0
Kirk & Randall	5,163	0	0	5,302	0	0
Holliday & Greenwood	5,139	0	0	5,249	0	0
Perry & Co.	4,990	0	0	5,280	0	0
Kearley, 4 Great Marlborough Street (*accepted*)	4,941	0	0	4,980	0	0

LONDON—*continued.*

For cleaning, painting, and redecorating the town hall, Commercial Road East, Limehouse, for Stepney Borough Council. Mr. M. W. Jameson, A.M.Inst.C.E., borough engineer, Whitechapel, E.

Aldin Bros. & Davies	£583	0	0
Barker	469	0	0
Campbell, Smith & Co.	415	0	0
Wickstead & Beardsell	414	0	0
Derby	395	0	0
Finch & Co.	349	0	0
Vigor & Co.	335	0	0
Wollaston & Co., 40 Turner's Road, E. (*accepted*)	296	0	0

MAIDENHEAD.

For additions to the electric light central station. Mr. Percy Johns, borough surveyor.

Bissley	£500	0	0
Partlo	485	0	0
Silver & Sons	459	0	0
Cox & Sons	418	0	0
Creed, Maidenhead (*accepted*)	394	9	0

REDDITCH.

For the construction of liquefying tanks, screening chambers and bacterial filters at the Redditch outfall works, in the parish of Ipsley. Mr. Arthur J. Dickinson, engineer and surveyor.

Woodcock & Riley	£9,436	0	0
Currall, Lewis & Martin	9,125	0	0
Huins & Sons	8,790	0	0
Johnson Bros.	8,790	0	0
Shrimpton	8,710	0	0
Price & Co.	8,589	0	0
Tilt Bros.	8,585	14	6
Meredith	8,285	0	0
Cunliffe & Sons	8,010	0	0
Trentham	7,832	16	2
J. & A. Brazier	7,600	0	0
Mason	7,469	9	11
Vale & Son, Stourport (*accepted*)	7,385	0	0

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SCOTLAND.

For additions and alterations on the public school, Tayport, and the subscription school.

Accepted tenders.

Pearson, Tayport, joiner	£366 0 0
Robertson, Tayport, mason	360 0 0
Farquharson, Dundee, plumber	203 0 0
Macbeth & Son, Dundee, plasterer	81 18 0
Storrier, Dundee, slater	67 7 0
Kirk, Dundee, glazier	13 6 0

STANFORD-LE-HOPE.

For the erection of boys' and girls' schools at Stanford-le-Hope, Essex. Mr. C. M. Shiner, A.R.I.B.A., 10 John Street, Adelphi, W.C., and Gate House, Grays, Essex.

		Pitch Pine.
Potter	£7,023 5 0	£65 0 0
Bruty	7,050 0 0	31 10 8
Dobson	6,580 0 0	47 6 0
Wall	6,500 0 0	47 6 0
Lawrence & Sons	6,267 0 0	52 0 0
Hammond & Miles	6,151 19 6	52 9 6
Spencer, Santo & Co.	5,986 0 0	47 6 0
Archer & Sons	5,973 0 0	47 0 0
Hammond & Son	5,875 0 0	23 13 0
Carter	5,400 0 0	39 0 0
Brown Bros.	5,360 0 0	43 7 0
G. Brown, Grays (*accepted*)	5,241 10 0	47 6 0

SWANLEY.

For the erection of two detached villas in High Road, Swanley, Kent. Mr. C. Wisher, architect, Erith.

Challenor	£3,245 0 0
Hicks & Co.	2,980 0 0
Rowbottom	2,933 0 0
Hill Bros.	2,795 10 0
Smith & Sons	2,763 0 0
Elliot & Co., Woolwich (*accepted*)	2,750 0 0
Button	2,695 0 0
Architect's estimate	2,800 0 0

SWINDON AND CRICKLADE (WILTS.).

For internal and external renovations to the county police-stations in the Swindon division, for the Wilts standing joint committee. Mr. J. G. Powell, county surveyor.

New Swindon.

Tydeman Bros., Swindon (*accepted*)	£37 18 0

Old Swindon.

Tydeman Bros., Swindon (*accepted*)	246 14 4

Cricklade.

Tydeman Bros., Swindon (*accepted*)	28 14 0

WALES.

For erecting a chemical laboratory and manual workshop at Intermediate school, Aberayron. Mr. G. Dickens-Lewis, architect, Aberystwyth.

Davies	£945 0 0
Edwards Bros.	815 0 0
R. & H. L. Owen	789 0 0
Edwards, Fanod, Aberayron (*accepted*)	748 18 0

For the erection of an isolation hospital at Croes Ynyd, near Conway. Mr. T. B. Farrington, architect, Llandudno.

E. Jones & Son	£12,373 0 0
Thornton & Sons	12,350 9 7
Thorpe & Sons	12,098 6 6
Owen	11,989 10 0
Martin	11,814 0 0
Huxley	11,765 0 0
Smith	11,628 0 0
Dallon & Son	11,595 0 0
Roberts	11,533 16 6
Griffiths	10,710 2 6
Hughes	10,379 15 5
D. Jones, Son, & Roberts, Conway (*accepted*)	9,942 6 11

For the rebuilding of Coedybrain farmhouse, near Aber Bargoed, Mon. Mr. Hugh Caldwell, C.E., architect, Blackwood, Mon.

Williams & Sons	£729 0 0
Davies & Williams	590 10 0
Vodden & Lee, Bargoed (*accepted*)	514 0 0



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WALES —*continued.*

For erection of eighteen houses at Penyrheol, near Caerphilly, for the Bargoed and Abertridwr Building Club No. 2. Mr. P. Vivian Jones, P.A.S.I., architect and surveyor, Hengoed.

Davies	£3,772	16	0
Cosslett	3,762	0	0
Isaac	3,555	0	0
Williams	3,544	4	0
Davies & Lloyd, Senghenydd (*accepted*)	3,510	0	0

WINTERBOURNE (GLOS.).

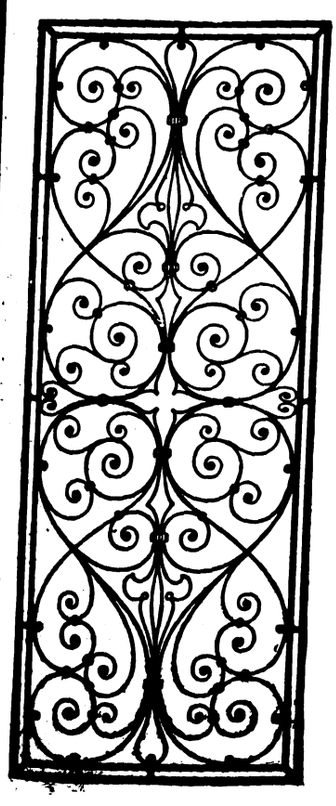
For new Council school at Winterbourne, for the Gloucestershire education committee.

Marsh & Stone	£3,990	0	0
Browning	3,785	0	0
Turner	3,719	0	0
Clark & Sons	3,715	0	0
Love	3,585	0	0
Orchard & Peer	3,500	0	0
Long & Sons	3,486	0	0
Byard & Sons	3,345	0	0
Nicholls	3,290	0	0
Adams & Jeffe[illegible]s	3,240	0	0
Walters & Sons, Bristol (*accepted*)	3,217	0	0

"America's Motherland." By T. W. D. Smith. (London: T. M. Middleton & Co. 1*s.* net, or 25 cents.) Protests have been raised from time to time against the suicidal frankness which puts valuable information concerning this country at the disposal of those who might some day, and that no very distant one, use it against Great Britain. Commercial rivalry is now so keen that too much care cannot be taken not to allow competitors any unreciprocated facilities for learning the secret details of trade. Again, there seems to be no doubt that foreign nations have opportunities for minutely planning an armed invasion of this country such as are offered nowhere else. Indeed, we have reason to believe that foreign officers know certain parts of the coast and certain counties far more intimately than they are known to ourselves. But there is one invasion which brings nothing but pleasure—viz., that successfully carried out by the American tourists. Though here also it must be acknowledged with humiliation that the *soi-disant* stranger usually comes with (and certainly leaves with) a more precise idea of what Great Britain has to offer than is possessed by the majority of its inhabitants at the present day. "America's Motherland" is the title of a concise guide for American visitors to England which has been published under the auspices of the Great Central Railway Company. Out of the 250 pages a little more than 100 are devoted to London, and in them the information is bright and pithy, thoroughly up-to-date, and is illustrated by photographs, so as to prevent the visitor forgetting altogether what he saw. There must be many omissions in a handbook where whole-page photographs and advertisements are sandwiched among the letterpress; but we are surprised to find that not a word is said about Trafalgar Square, with its Nelson Column—surely a prominent feature in the historical topography of the metropolis! The view of the latter is scarcely adequate. However, London is, after all, only an incident in a tour in England. The provinces must call for equal notice. A chapter has been contributed by Mr. Clement Shorter, entitled "In a Land of Famous Men," while that on "The Home of Shakespeare" is written and signed by Marie Corelli. This latter would alone make the booklet attractive, more especially as the final photograph is of "Mason Croft, Stratford-on-Avon. The Home of Miss Marie Corelli." There are finally mentioned about ten other places of personal or historic interest. The book will provide purchasers on their return with an agreeable memento of what was seen in America's Motherland.

The Berkshire County Council have been informed, in connection with the competition for the proposed new county offices at Reading, that after considerable negotiations with the Royal Institute of British Architects, paragraph 1 of the printed conditions has been approved in such a form that when the assessor has selected the three best designs two members of the Council will join him in making the final selection of the architect, but the Council do not bind themselves to carry out any one of the designs submitted. The Chairman and Vice-Chairman of the Council have been appointed to act in conjunction with the assessor.

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VARIETIES.

Mr. F. W. Pomeroy has been commissioned to execute a memorial statue in Liverpool of the late Earl of Derby.

Walsall Corporation gas committee have decided to recommend an extension of the area of supply to include Pelsall and High Heath, at an estimated cost of 3,365*l.*

The Rotherham Rural Council have received the sanction of the Local Government Board to borrow 4,050*l.* for sewage works at Dalton and Thrybergh.

The Mayor of Ludlow has announced that to signalise his tenure of office he will present a drinking-fountain to the town.

The vicar and churchwardens of St. Mark's, Old Street, London, have received 500*l.* from Sutton's Trustees as payment to the church of compensation in regard to interference with ancient lights. The money is to be expended on repairs and alterations.

The road from Keswick to Seatoller past Lodore Falls and through Borrowdale Valley in the Lake District is to be made 18 feet wide, at a cost of 6,600*l.*, by the Cockermouth Rural District Council. The Cumberland County Council grants 2,500*l.* towards the scheme and will afterwards take the road over.

The Arts and Crafts Exhibition Society (Mr. Walter Crane, president), which was founded in 1888, will open its ninth show of contemporary work in design and handicraft (limited to the last twenty years, and not having been previously shown in London) at the New Gallery on January 8. The receiving day will be December 28.

The Grimsby Borough Engineer (Mr. H. Gilbert Whyatt, A.M.I.C.E.) reported to the finance committee on the 4th instant that fifty-one designs had been received from fifty architects in connection with the competition for the extension of the town hall. After some discussion the finance committee, by a small majority, decided to submit them at once to the Assessor (Sir W. Alfred Gelder, F.R.I.B.A., of Hull). We understand his report may be expected in about five weeks.

A report from Messrs. Crouch & Hogg, civil engineers, Glasgow, is to be obtained by Dundee district committee with reference to Pitairlie bridge. There are three schemes proposed. The first is to deviate the road, which would cost 2,400*l.*; second to build a girder bridge at an estimated expenditure of 1,400*l.*; and third, to repair the bridge, which would involve an outlay of about 1,400*l.*

At a Consistory Court at St. Paul's Cathedral, Chancellor Tristram sanctioned an agreement that bells at the new church of St. Jude-on-the-Hill, which it is proposed to erect in the centre of the Hampstead Garden Suburb, shall not be rung before 7.55 a.m., or for more than five minutes before any service. It was stated that most of the householders in the garden suburb supported the agreement.

The Ealing Town Council has offered in exchange for three acres of allotment land at West Ealing (to be converted into a recreation ground) to give the trustees of the ground six acres in another part of the borough. Application is to be made to the Local Government Board for a loan of 4,000*l.* to carry out the necessary work. The Council has also agreed to the expenditure of 2,600*l.* on the purchase of land for the purpose of a smallpox hospital.

Mr. George Balfour, M.I.E.E., of College Hill, Cannon Street, London, intends to apply to the Board of Trade on or before December 21, 1909, for a provisional order to authorise the production, supply, and distribution of electricity in the parishes of Ballingry and Auchterderran, N.B. The Kirkcaldy district committee have granted their consent to the proposed application.

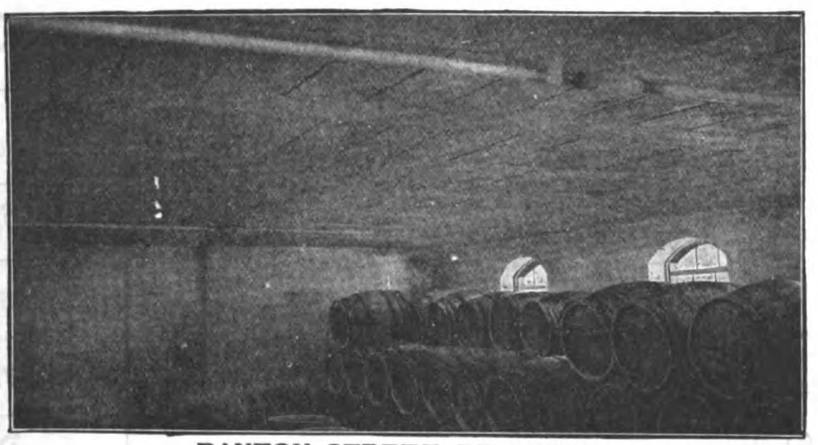
According to a return presented to the Islington Borough Council the net capital expenditure for the year 1907-8 of the fifteen electricity undertakings owned by as many Metropolitan borough councils was 5,925,009*l.*; units sold numbered 61,931,061; the average price per unit was: public, 1.71*d.*; private, 3.43*d.*; power, 1.15*d.*; total, 2.49*d.*; the average cost of production per unit was 1.20*d.*; the gross profit realised was 336,533*l.*, and consumers totalled 28,846. The capital written off amounted to 124,207*l.*, and there was transferred to reserve and other funds 30,879*l.*

The *Board of Trade Journal* announces that the *Oesterreichischer Zentral-Anzeiger* (Vienna) contains a notice to the effect that Mr. Isidor Rendes, the proprietor of the Meteor Hotel in Budapest, intends to build an hotel at the corner of Rákóci-Strasse and Csokonai-Gasse. It appears, also, that the Ritz Hotel Construction Company, of

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ILLUSTRATIONS.

ALLANGATE, RUSTINGTON, SUSSEX.—GARDEN FRONT—FRONT ENTRANCE GABLE—ENTRANCE FRONT.

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Paris, have decided to build, at a cost of 2,500,000 kronen (about 104,000*l.*), an hotel, also in Budapest, on the banks of the Danube.

THE Consistory Court of London have granted a faculty to authorise the pulling down of Holy Trinity Church, Kingsway. The church was built in 1831, and in 1905 showed signs of cracking. The foundations of the church rested on sand and gravel, and in consequence of the large amount of water drawn away in connection with the construction of tube railways and other works, the building became unsafe. The Bishop of London gave instructions that the church should be pulled down and rebuilt. It is estimated that the new church would cost about 8,000*l.*

THE promoters of the forthcoming Business Exhibition at Olympia have this year decided to try the experiment of setting apart a certain amount of space which inventors will be able to use free of rent for the display of their models, products, specifications, or other material which will give the information necessary to interest possible investors who will visit the exhibition. It is not intended to include patents which have already been placed on the market, but will consist of new inventions and ideas in their rough state with the view that those which are practical may be brought to the notice of men who are able to finance them and place them on the market under the best auspices.

THE report of the directors of the Great Western Railway Company for the past half-year gives unusual prominence to schemes for the development of the company's interests in South Wales. Among the expenditures for which the sanction of the shareholders will be asked at the forthcoming meeting will be the following:—Widening portions of Monmouthshire Railway, 50,000*l.*; quadrupling line at Newport, 35,000*l.*; locomotive depot and marshalling sidings at Rogerstone, 50,000*l.*; coal tips at Swansea's new dock, 80,000*l.* These four sums represent a total estimated capital and expenditure of 215,000*l.* In addition, the company also propose during the current half-year to sink other sums in improving siding accommodation at Aberdare, Llancaiach, Pontypool Road, Port Talbot.

CONSIDERABLE damage has been done in the parishes of Minsterley and Pontesbury for many years past in times of heavy rain owing to the River Rea—which runs through the Rea Valley and joins the Severn at Shrewsbury—flooding over the land for miles. The worst section is between Horsebridge and Pontesbury, a distance of several miles. A drainage scheme has now been prepared by the Board of Agriculture. At a meeting of the committee held at Shrewsbury, a clerk and a surveyor were appointed for the first year, and instructions were given for the river to be measured and staked for the purpose of obtaining tenders for the necessary work. The river, which winds very considerably, will have to be straightened, the side drains and brooks cleaned out, the river bed deepened to a certain depth and a uniform width maintained.

UNDER the winding-up order made against the Piccadilly Hotel, Ltd., the Assistant Receiver has now issued a summary of the statement of affairs. This shows liabilities 1,906,569*l.*, of which 854,641*l.* are returned as expected to rank for dividend, and estimated assets 539,380*l.* After the payment, however, of loans on debenture bonds and other claims, there is nothing for the unsecured creditors, while in relation to the shareholders a total deficiency of 1,502,676*l.* is disclosed. The directors attribute the failure to the alterations in the plans and designs of the building insisted upon by the Crown, which they state entailed an expenditure of about 160,000*l.* in excess of the original contract price. In addition, there resulted a loss of rentals and interest of over 40,000*l.* Further, they stated that the alterations in the shops made them unsuitable for the class of shop desired in the neighbourhood, thereby decreasing the valuers' estimated annual rental value of 31,500*l.* to a present one of 10,000*l.* only.

THE National Association of Master House Painters and Decorators of England and Wales will hold their sixteenth annual convention at Sheffield from September 13 to September 18, under the presidency of Mr. James Puttrell. The meetings will begin on Monday evening, September 13, with the president's reception, when Mr. and Mrs. Puttrell



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will receive the members and friends in the Exhibition Hall, Shoreham Street. The exhibition of Decorative Art and Manufactures, which is to be opened on Tuesday by Sir Wm. Richmond, R.A., K.C.B., will well sustain the interest created by previous exhibitions. This year there will be—for the first time—the work sent in for competition for the Extension prize scheme. There will also be an interesting exhibit of the studies made in Italy, by three prize-winners of the International Travelling Scholarship, Messrs. Bert Hamlyn (Bideford), Tom Stoney (Bingley), and Ivor Beaumont (Huddersfield). The sixteenth competition of apprentices' work will be held in the conference hall. The exhibition side of the convention programme will be of greater interest than usual, and the business and literary side of the convention will in nowise fall behind its predecessors. Among the most important events will be the address on September 14, by Sir Wm. Richmond, on "House Decoration for the Masses."

The Sanitary Inspectors' Examination Board announce an examination for certificates of qualification for appointment of sanitary inspector or inspector of nuisances under section 108 (d) of the Public Health (London) Act, 1891, will be held in London, on Tuesday, January 18, 1910, and the four following days. In the event of a sufficient number of candidates making application, at least a month previously, examinations may also be held at the following centres:—Birmingham, in June, 1910; Bristol and Cardiff, as arranged in 1910; Liverpool, in April, 1910. The conditions upon which candidates are admitted to the examination, and all necessary particulars will be forwarded on application to the Hon. Secretary, The Sanitary Inspectors' Examination Board, 1 Adelaide Buildings, London Bridge, E.C.

The Council of the Institute of Sanitary Engineers have for a long time felt that it would be very desirable if a summer conference could be arranged at some convenient centre and time, suitable to the majority of the members in different parts of the country. Some of the summer meetings already held have been very successful, but others, owing to small attendance, have been far from satisfactory, the difficulty being apparently to fix upon a suitable town in which to hold the meetings. London has not yet been tried and the Council have decided to canvass the members in order to ascertain, if possible, how many would be willing to attend a conference in London about June 10 to 13, 1910 (inclusive). The Institute have arranged a course of twenty-one lectures in practical sanitary science and engineering, for which the fee is 17*s.* 6*d.* A syllabus may be obtained from Mr. N. W. Hoskins, hon. secretary, 120 and 122 Victoria Street, Westminster, S.W.

In the course of repairs to the wall between the Norbury chantry and chancel of Stoke D'Abernon church, under the supervision of Mr. Philip Johnston, architect, some discoveries have been made. In the space between the pre-Conquest chancel roofing and the vaulted stone ceiling of the thirteenth century lay the larger half of a Norman piscina, which probably was in use previous to 1210, when the remodelling of the chancel was commenced. On the face of the Saxon wall between the ceiling and the roof were found traces of Saxon painting. Beneath is an inscription, of which as yet only a few letters have been deciphered. The fact has been disclosed that originally the two Saxon walls of the chancel converged, and probably terminated in an apse. The stripping of the north wall of the chancel, which is built at an angle to the nave, has revealed the Saxon wall within. The latter does not follow the line of the north wall, but traverses it at an opposite angle, and converges towards the south chancel wall. The fireplace in the north wall of the chantry, now blocked up, is to be opened. It is, according to Mr. Johnston, "probably the only example of mediæval date in a Surrey church, and one of the very few ecclesiastical fireplaces in England." Instructions have also been given to leave exposed to view a small portion of the Saxon wall of the chancel when making good the work of repair, so that its converging character may remain visible.

The Royal Sanitary Institute, 90 Buckingham Palace Road, S.W., have arranged a series of lectures and demonstrations on Sanitary Science as Applied to Buildings and Public Works. The fee for the entire course is 2*l.* 12*s.* 6*d.* The first lecture is on October 8, by Dr. G. F. McLeary, on "Elementary Statistics." It is followed by four on "Science," by Dr. E. J. Steegmann. The other lectures are, "Calculations, Measurements and Plans and Sections," by Mr. W. C. Tyndale, M.Inst.C.E.; a set of three by Mr. H. D. Searles-Wood, F.R.I.B.A., on "Building Materials,"

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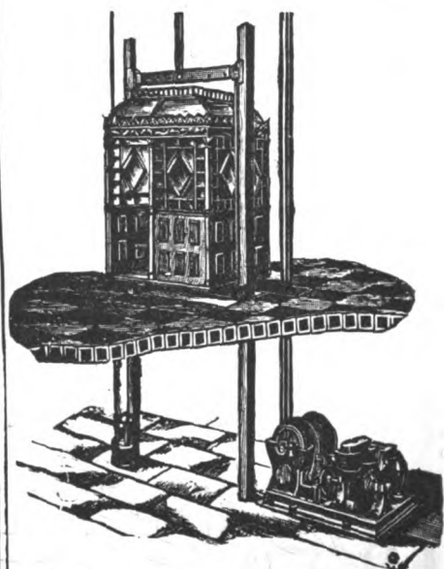


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"Sanitary Building Construction (Advanced)," and "Sanitary Building Construction and Planning; Soil and Local Physical Conditions"; "Sanitary Appliances," by Mr. W. C. Tyndale, M.Inst.C.E.; "Ventilation, Warming, and Lighting," by Col. J. Lane Notter, M.A., M.D.; "Details of Plumbers' Work," by Mr. J. Wright Clarke; "House Drainage," by Mr. W. C. Tyndale, M.Inst.C.E.; "Water: Composition, Pollution, and Purification," by Prof. H. R. Kenwood, M.B., D.P.H. Four lectures by Mr. John Ed. Worth, M.Inst.C.E., district engineer, London County Council, on "Water Supply, Sources of Supply and Distribution," "Sewerage," "Sewage Disposal," and "Scavenging, Disposal of House Refuse."

BUILDING AND BUILDERS.

A NEW bakehouse is to be erected at Macclesfield Workhouse at a cost of 1,804*l.*, inclusive of machinery and offices.

THE Iron and Steel Institute offer a prize to the value of about 30*l.* for the best original paper dealing with any branch of the Mechanics of the Supply or Distribution of Water.

THE Louth Town Council are to apply to the Local Government Board for a loan of 20,540*l.* for carrying out an amended drainage scheme prepared by Mr. Baldwin Latham.

COWDENBEATH Literary Society, Cowdenbeath, N.B., have decided to extend their premises at an estimated cost of 500*l.*, and including furnishing, 800*l.* The available ground to the rear of the present building will be utilised.

THE Southport magistrates have granted a music and dancing licence for a skating rink, to accommodate 3,000 people, which is to be built on a central site leased from the Corporation.

THE Kirkcaldy Dean of Guild Court at their last meeting passed the following plans:—Alterations on shop at 18 Bridge Street; extension and alterations on factory at Links Street for Messrs. Robert Stocks & Co.; alterations on the north factory for Messrs. M. Nairn & Co.; and internal alterations at King's Theatre.

THERE has been quite a revival in the building trade at Willesden during the past few weeks. The District Council have just passed plans for eighty new houses, in addition to which they sanctioned the erection of 100 dwelling houses a month ago.

THE Reading Town Council have agreed to apply, on the Board of Education approving the estimates, to the Local Government Board for sanction to a loan of 10,250*l.* for the alterations to the main block and the erection of class-rooms and offices at Reading school.

AT a special meeting of Fraserburgh Town Council on Monday it was unanimously agreed to proceed at once with the bringing of the new water supply from Federate, New Deer, for the burgh of Fraserburgh, according to plans prepared by Mr. William Allan Carter, C.E., Edinburgh, at an estimated cost of 46,000*l.*

A NEW plan has been submitted to the building committee of the Grindleford Church, Derbyshire, and approved. It is smaller and less costly than the one rejected on account of the expense. It is hoped that the building operations will soon commence. The sum of 1,839*l.* has been collected towards the fund.

AT the last monthly meeting of the Darlington Corporation street committee, thirty plans for new houses in different parts of the town were approved. One set of plans was for twenty houses at Bank Top. It was also stated that the erection of new offices by the North-Eastern Railway Company for their new works on the Stoppendale estate is to be gone on with at once.

THE restoration of St. Mary Magdalene Church, Launceston, is to be continued. The object of the Church Council is to commemorate the four-hundredth year of the rebuilding of the fabric, in which the curious and well-preserved sculptures are a feature. Mr. E. H. Sedding is to carry out the proposals contemplated by the late J. D. Sedding.

THE finance and works committees of the Dundee Harbour trustees recommend to the Board that the reconstruction of the west roundhead at Camperdown jetty should be carried out in ferro-concrete at an estimated cost of 4,600*l.*; and that a new crane barge should be obtained, chiefly for work in the river in mooring and repairing buoys, to cost 5,000*l.*

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For Index of Advertisers, see page X.

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The meeting also decided to recommend an expenditure of 600*l.* for improvements on the patent slip, and of 1,000*l.* for the improvement of lighting and buoys.

At the last meeting of the Lambeth Borough Council the finance committee reported that under the umpire's award the London County Council would have to pay Lambeth 81,342*l.* as purchase money and compensation in connection with the acquisition of Lambeth's wharves and premises in Belvedere Road, as a site for the new county hall. As the sum awarded by the umpire exceeded that offered by the County Council that body will have to pay the costs of the arbitration. A small committee will consider how the money should be dealt with.

The Manchester City Council last week considered the sanitary committee's application for borrowing powers for housing purposes. The sanitary committee started a scheme some five years ago for building houses on what is known as the Temple Estate, Cheetham Hill. Land was bought and plans for the erection of cottages were prepared. The committee's proposals, however, did not at first find favour with the Council. New plans were prepared, and these the Council were last week invited to pass and let the committee take the usual steps for borrowing 16,615*l.* to cover the cost of the 82 cottages and putting streets in order. On the recommendation of the finance committee it was decided by the Council that representations be made to the Local Government Board that the obligation to provide the houses referred to might be waived in view of the number of houses now empty and suitable for the housing of the class of persons to be displaced.

The Newcastle Town Council have leased to Mr. G. W. Parkinson 4,770 square yards of land abutting on Northumberland Road, and bounded on the east side by the riding school, and on the west side by Ginnett's circus. It belongs to the Magdalene Hospital estate, and the rent to be charged is 500*l.* per annum. It is proposed to erect on the site a "White City." At the same meeting last week a report from the estate and property committee was adopted, recommending that 11¾ acres of land be leased to Messrs. Sir W. G. Armstrong, Whitworth & Co., Ltd., at Walker. This, with leases already sanctioned, makes a total of 33¾ acres at a rental of 886*l.* per annum. It is understood that the Elswick firm intend to make alterations so that there will be space to build a Dreadnought and to accommodate the largest vessels afloat, as well as for carrying out other important Admiralty work.

The Glasgow Corporation at their meeting on the 5th inst. considered a letter from the Glasgow and West of Scotland Building Trades Employers' Council regarding the bylaws under the Building Regulations Act, 1909. The letter stated that they understood that the draft bylaws were to be put before the Council that day. Owing to the holidays intervening, the members of the Building Trades Employers' Council had had no opportunity of examining the bylaws. The Council would be extremely obliged to the Corporation if they would delay further consideration of the bylaws until, say, a month from that date, and by that time the members would have gone over them. On the proposal of the Lord Provost it was agreed to delay consideration of the bylaws for five weeks. At the same meeting the parks committee recommended that bandstands be erected in Rouken Glen and Bellahouston Park, and two additional drinking fountains in the latter park, and also that the offer by Messrs. A. & J. Main & Co., Ltd., for the erection of the new gates at the Victoria Road entrance to the Queen's Park for 500*l.* be accepted, on condition that the quality of the stone for the pillars and certain minor alterations on the design will be to the satisfaction of the city engineer, and that a modification will be made as to the style of the lamps on the pillars, to meet the requirements of the lighting department.

Exmouth Urban District Council have received a report from Messrs. G. H. Hill & Sons, on the result of the boring at Dolton Lane. The engineers mentioned that the boring had reached a depth of 338 feet below the surface, the last 34 feet being in the pebble beds. The official test showed a yield of 960,000 gallons per day, so that as the estimated additional requirements of Exmouth alone in the year 1931 were estimated at nearly 300,000 gallons a day the supply furnished by the boring was adequate. The final cost of boring was 1,605*l.* 14*s.* 8*d.* The parliamentary estimate of the scheme prepared last year amounted to 43,000*l.*, of which, however, 5,000*l.* was provided to cover future exten-

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sion of piping, &c., in the district. The amount attributable to the new source of supply was therefore 38,000*l*. It had now been estimated that the boring alone would supply all the water required, and that 8,700*l*. for the well and adits provided for in the parliamentary estimate would not be required. The 38,000*l*. was thus reduced to 30,906*l*. Again the level of the water in the borehole when three times the supply was being taken was only about 45 feet from the surface. This fact allowed economical use of a much less costly type of pumping machinery, which was estimated now at 3,252*l*. A reduction would also be shown in the estimated cost of the trunk mains. The 38,000*l*. was therefore still further reduced to 28,033*l*.

TRADE NOTES.

A LARGE chiming clock has been erected in the parish church, Rangemore, Burton-on-Trent, as a memorial to the late Lord Burton. It was formally started by Lady Burton. It shows time on four large dials and is fitted with all the latest improvements, being made generally to the designs of the late Lord Grimthorpe, by John Smith & Sons, Midland Clock Works, Derby, who made the Burton town hall clock for the late Lord Burton many years ago.

A NEW clock and chimes were dedicated on August 2 by the Rev. the Dean of Carlisle, at Bampton Church, Westmorland, as a memorial to the Dalton family, and made and fixed by Messrs. Potts & Sons, Ltd., clock manufacturers, of Leeds and Newcastle-on-Tyne, who are making a large illuminated clock for Lincolnshire, and large clock and chimes for Middlesbrough, Yorks, and for the ancient collegiate church of St. Cuthbert, Darlington, from the late Lord Grimthorpe's plans.

A COMPANY has been registered as the Clean Air Ventilator Co., Ltd., with a capital of 5,000*l*. in 1*l*. shares. The offices are at 115 Liverpool Road, Manchester.

A NEW Wesleyan church, at a cost of 4,000*l*., is to be erected at Cromer. The foundation stone was laid on Wednesday.

THE GATEHOUSE, WETHERAL PRIORY.

THE Gatehouse—all that now remains of Wetheral Priory—appears to have been constructed by Abbot THORNTON very shortly before the suppression of the monasteries by HENRY VIII. It has a round semi-circular-headed arch, surmounted by a square label in the same wall. The Gatehouse is situated the same as at



THE GATEHOUSE · WETHERAL · PRIORY

Carlisle, to the south-west of the church. The priory was founded by RANULPH DE MESCHINES, Earl of Cumberland, in the reign of WILLIAM II. It was erected as a cell to the abbey of St. Mary at York, and dedicated to St. CONSTANTINE. In 1546 A.D. HENRY VIII. gave it to the Dean and Chapter of Carlisle, in whose possession it still remains. Our illustration is from a sketch by Mr. H. SCOTT-SAWYER.

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TRANSATLANTIC PASSENGER AND MAIL TRAFFIC.

Various references have recently appeared in the public Press as to the relative advantages of different ports for the call of the larger and faster Transatlantic steamers, and there seems to be little doubt that the facilities afforded by the harbour at Fishguard show a material saving when compared with other ports, as will be seen from the following table:—

New York	to	Fishguard	direct	2,902	miles.
,,	,,	,, Holyhead	,,	2,943	,,
,,	,,	,, Plymouth	,,	2,957	,,
,,	,,	,, Liverpool	,,	3,015	,,
,,	,,	,, Southampton	,,	3,076	,,

Compared with Liverpool, therefore, the saving in distance to Fishguard is 113 miles, and owing to the slackening of speed necessary on the Mersey the time occupied in sailing this distance is material.

It is recognised that the steamship companies have to cater for the continental as well as the English traffic, and there is no doubt that Plymouth is the best available port of call for liners making their home at Southampton. For vessels making their home at Liverpool, however, there can be no question that the most convenient and serviceable port of call is Fishguard.

As at Plymouth, the most complete arrangements exist at Fishguard for dealing with vessels of the largest capacity, and the experience of the Booth Line, which regularly makes use of the port, is that the facilities are quite up-to-date. Commodious tenders meet the vessels which anchor inside the breakwater, where there is ample depth of water for the largest ships, and the conveniences at the station are of the most modern description. The quay space is over half a mile in length, and an additional station has recently been opened on the breakwater itself, equipped with the necessary waiting rooms, customs depot, and telegraph office. The depth of water alongside this ocean quay station is 40 feet.

The distance by rail from Fishguard to London is 261 miles, and the time occupied on this journey by an ocean special, with a stop at Cardiff to set down passengers for South Wales and the Midlands, is no more than 4¾ hours.

Then again, the splendid service which is given twice a day by the turbine steamers between Fishguard and Rosslare is available for passengers and mails for Ireland if landed at Fishguard.

The commercial prosperity of the country is so much dependent upon the facilities afforded for the landing of mails and the quick transit of passengers, that, having regard to the information given above, it is not surprising that the attention of the principal steamship companies is at the present time being focussed on Fishguard as a port of call.

LONDON MASTER BUILDERS' ASSOCIATION.

The following meetings have been held since the June report:—Special Council, July 8; Organisation Committee, July 29; Ordinary Council, July 29.

The Special Council Meeting was held for the purpose of considering matters relating to the Land Taxation Clauses in the Finance Bill before Parliament, and, after approving the Emergency Committee's report, the subject was widely discussed and the following gentlemen were elected to represent this Association at the forthcoming conference:—Mr. F. G. Rice (President), Col. G. Haward Trollope, Mr. Joseph Randall, and Mr. H. W. Horner.

The Organisation Committee's report was submitted orally by the chairman (Mr. F. Higgs) and instructions were given to send out a statement of the recommendations with the notices convening the Council Meeting.

The Ordinary Council Meeting received and approved the Committee's reports and endorsed the views expressed by its representatives at the late Portsmouth half-yearly meeting of the National Federation that, taking into consideration the satisfactory results of the operation of the agreement between this Association and the Operative Plasterers of London, the new N.A.O.P. General Rules should not supersede the Working Rule Agreement already existing between these two bodies.

The Council then elected Mr. E. A. Hough a member of the L.M.B.A., and gave instructions to the solicitor to investigate and report upon the particulars of the case in which an appeal was made against the decision of an arbitrator.

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From a feeling of international courtesy, and because of the warmth of hospitality extended to British builders by them last year, the Council gladly decided to invite the party of Belgian master builders, who are now visiting London, to dinner at St. Ermin's Hotel, Victoria Street, Westminster, on Thursday, August 12, of which the members of the Association were duly advised.

Among the correspondence was a letter from the President of the R.I.B.A. to Mr. J. Carmichael, congratulating him upon the evidence he gave in connection with the L.C.C. (General Powers) Bill 1909. The Council had much pleasure on learning the fact, and added its high approval and appreciation of Mr. Carmichael's action.

ELECTRICAL SMELTING.

The British Consul at Stockholm, in his report for 1908, gives a long note on the electrical smelting of iron ore. He says that the technical practicability of smelting iron ore by electricity was proved some years ago. It is now claimed that a commercially economical method has been discovered in Sweden by which it is hoped that with the aid of the vast water power of the country its enormous mineral deposits of ore, of which the richness and quality has been recognised for centuries, may be smelted without the importation of so much coal or such a consumption of charcoal. If this economical problem has been solved, credit must in the main be given to the three Swedish engineers, Assar Gronwall, Axel Lindblad, and Otto Stalhane, who for the past two and a half years have steadily experimented.

An oven of sufficient size for practical purposes has been erected at Domnarfvet. Into an ordinary oven, without blast, however, ore and charcoal are mixed from above in the usual manner, electric wires are introduced into the bottom of the oven, which should give a temperature of at least 2,000 deg. Cent. in the smelting oven. During the process air must be entirely excluded. The charcoal which is used is simply for reducing the ore, the consumption being calculated to be about one-third of that usually required in a blast-furnace. Electrical power required may be considered to be 1.3 h.p. per ton of pig iron. If the price of electricity be 50kr. (2*l.* 7*s.* 10*d.*) per horse-power, the total cost consequently of producing a ton of pig iron may be reckoned as about 29kr. (1*l.* 12*s.* 3*d.*). The use of electrod is not expected to exceed 1kr. (1*s.* 2*d.*) per ton. The life of an oven is considered longer than that of a blast-furnace. It is, moreover, claimed that the product is of excellent quality. Sulphur is almost entirely eliminated and the iron freed from gas and slag. Good iron can even be produced from excessively sulphurous ores, whereas its phosphorous qualities are not diminished. Instead of charcoal, coke may equally well be used.

The problem has, at any rate, been solved to such an extent as to attract much attention, and Dr. Eugene Haanel, Director of Mines, Ottawa, Canada, who for years past has encouraged experiments on these lines, came to examine the process, and is reported to consider that "if the process is carried out on a sufficiently large scale, the cost of producing iron in this way would justify its use in Canada in some of the districts where energy is supplied at cheap rates." It will, however, still remain a question whether it will pay better to smelt great quantities of iron ore in Sweden and export it as pig iron than to continue exporting ore as hitherto; unless, of course, Sweden can use the pig iron herself. Even if Sweden by this process can produce pig iron much more cheaply than hitherto possible in Sweden, it does not follow that such pig iron would be cheaper than pig iron produced from Swedish ore in other countries. Again, the total horse-power to be developed from Swedish waterfalls is only estimated at 4,000,000 horse-power, and naturally much of this is not situated conveniently for the ore, so that additional transport must be considered. Another problem is, what proportion of the electrical horse-power, in view of other industries, can be profitably expended on producing pig iron? Assuming that the new method of electrical smelting proves successful, no great subversion of trade would be likely to immediately follow, when one remembers the enormous quantity of ore that the country possesses, provided that the mining of it be permitted.

The Westhoughton Urban Council, Lancs., have instructed their surveyor to prepare plans and estimates for the erection of baths. A site has not yet been purchased.

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THE STORY OF LONDON.

The last of an interesting series of lectures at the Garden Suburbs Institute, Hampstead, given in connection with the Town-Planning and Housing Exhibition held there, was delivered on August 4, before a crowded audience, by Mr. S. K. Ratcliffe. The lecturer explained that only a hasty sketch was possible in the time at his disposal, and that even in that there must be many big gaps, for the story of London was a continuous history from the time of the Roman occupation. The Roman city which grew up on the site of the British tribal stronghold rapidly became a place of importance as a centre of commerce, admirably situated as it was for the two great streams of trade from the Mediterranean and the Baltic. What happened to London after the Romans left Britain it was exceedingly difficult to say. The most probable conjecture was that the city was not destroyed by the Saxon invaders, but that its citizens made terms, as so often afterwards, with the conquerors.

To King Alfred belonged the credit of rebuilding and resettling the city after its partial destruction by the Danes. He rebuilt the wall, and was evidently the first English monarch to realise the importance of London as the metropolis of England. At the Norman Conquest the city, against the advice of its sheriff, opened its gates to William, who signalised his overlordship by building the Tower and granting London its first charter. Both events had been somewhat misinterpreted by some of the historians of London. The Tower was not intended for the defence of the city, but to overawe the citizens; the charter, instead of granting fresh privileges, merely confirmed the rights and liberties which had been enjoyed by the citizens of London during the Saxon times. It was the first of a long series of charters, and the relations between William the Norman and the citizens were the starting-point of a protracted struggle for liberty between the city and the monarchy, a struggle which issued in the grant to the commune of the gradual consolidation of the power of self-government embodied in the three estates of the City—namely, Lord Mayor, Aldermen and Common Council.

After describing and illustrating, with the aid of lantern slides, some aspects of Mediæval London and sketching briefly the life of the citizen, the lecturer went on to speak of the development of the merchant-citizens in the sixteenth and seventeenth centuries and the principal characteristics of the Elizabethan city. It was during the Elizabethan epoch that the civic authorities found themselves confronted with the problem of expansion, the spread of the city beyond its ancient boundaries, and attempted to deal with it by means of proclamations and Acts of Parliament, forbidding the building of houses within a certain distance of the walls. Expansion being inevitable, such a policy was necessarily futile; but it was interesting to speculate as to the probable development of London had the problem been correctly understood 300 years ago.

The Mediæval city disappeared with the Great Fire. London had an architect of genius in Sir Christopher Wren, who, if he had been permitted to carry out his scheme of city design, would have made a noble beginning for the modern city. But the opportunity was not given to him, so that Wren was compelled to devote to the building of churches the scientifico-artistic genius which should have been employed in the remaking of the streets. What happened in the City itself after the fire was typical of what had been happening all along outside the boundaries. Greater London had grown up without control or direction, and one consequence of this undirected expansion was that the metropolitan area had never been a unity. Only in the City proper was there a tradition of civic government and civic sentiment; the parishes and villages which had become absorbed into the ever-growing metropolis had had to wait until our own day for the machinery of administration. Hence it was not possible that the dwellers in Greater London should ever share in the feeling of civic pride which was characteristic of the ancient city. Their task was to create new cities out of the boroughs and urban areas which to-day made up the province or region of modern London.

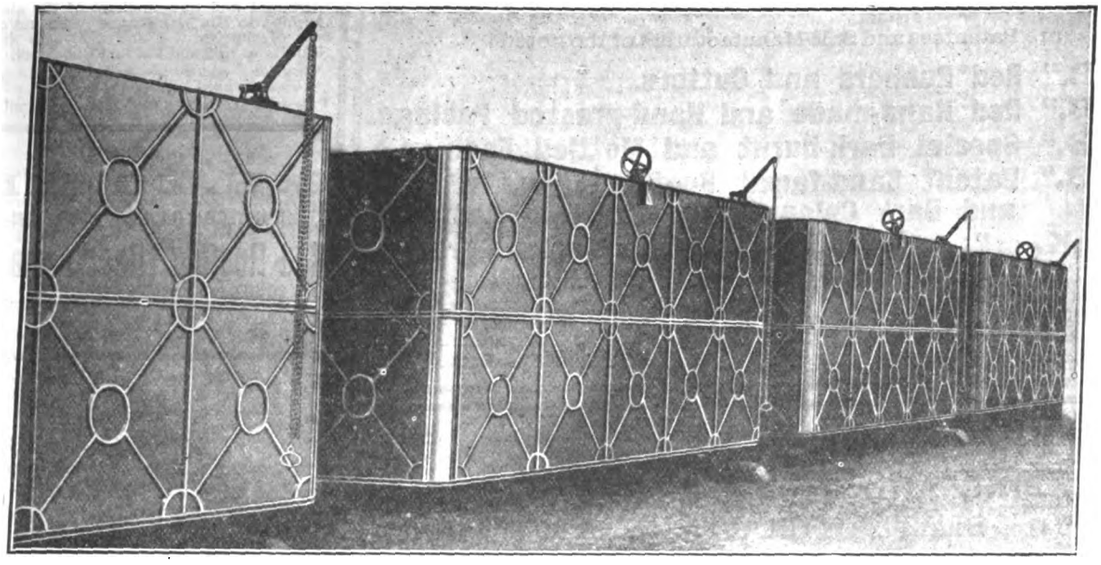
The excellent slides shown by the lecturer illustrated some of the more important ancient buildings and streets, the spread of the city westward, old Charing Cross and Whitehall, the planning of West Central London in the eighteenth century, rural Hampstead and its neighbourhood, and the seamy side of the expanding metropolis, as shown by such satirists as Hogarth and Rowlandson.

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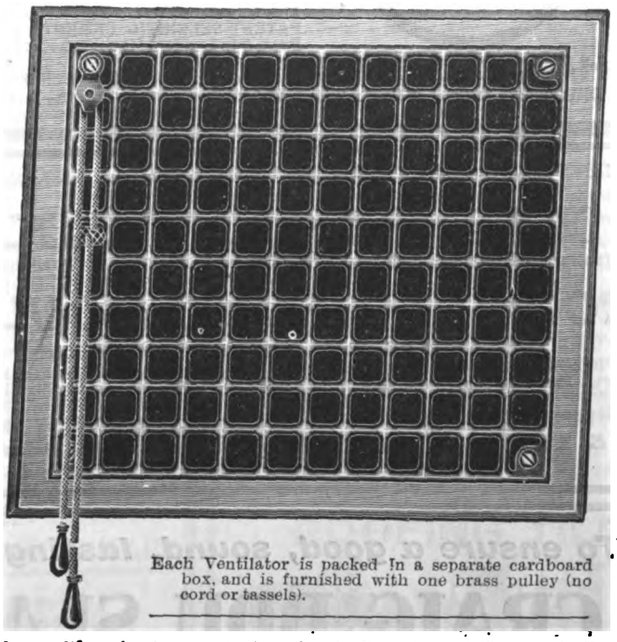
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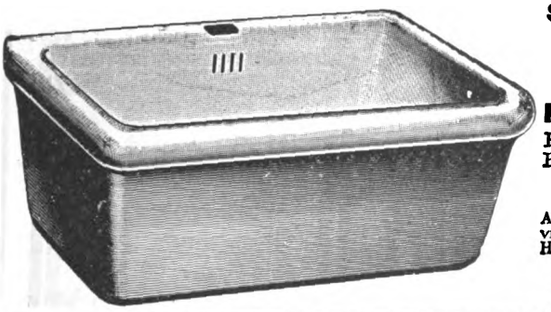
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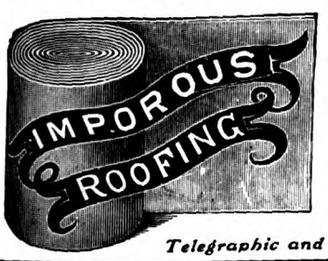
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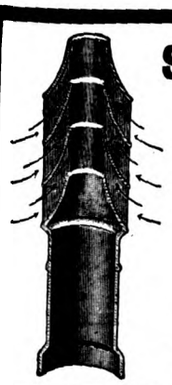
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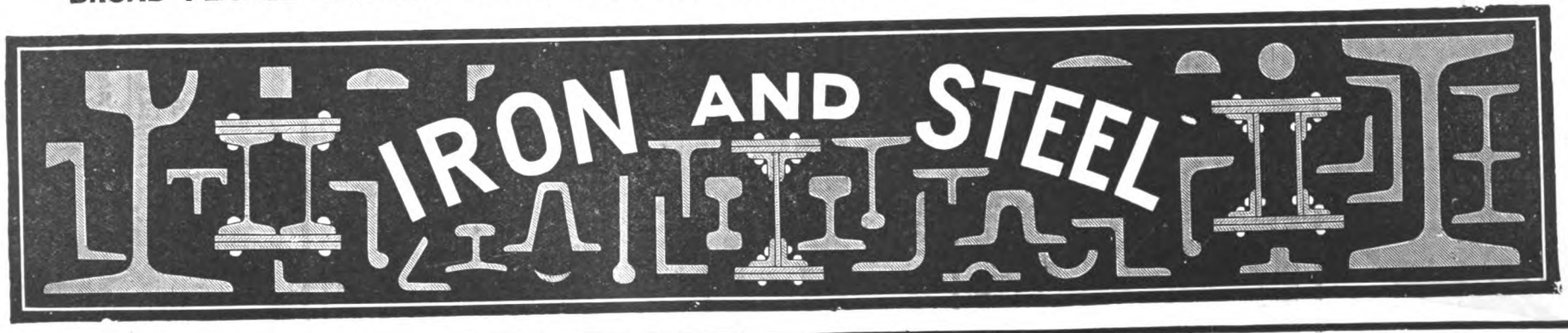
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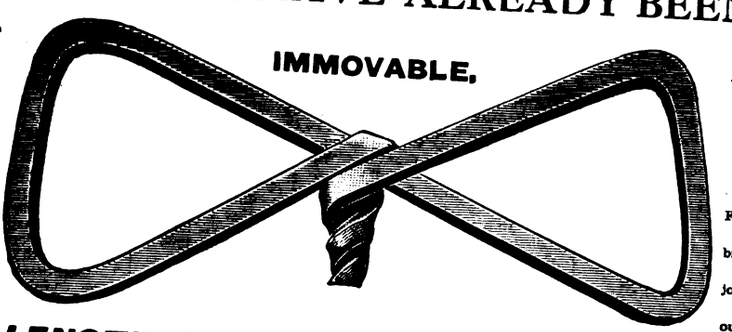
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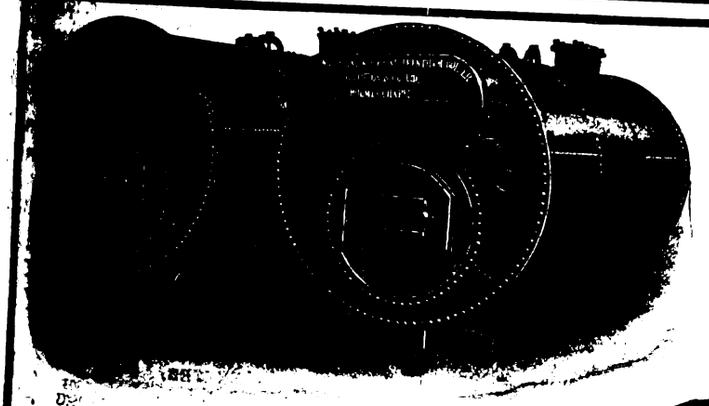
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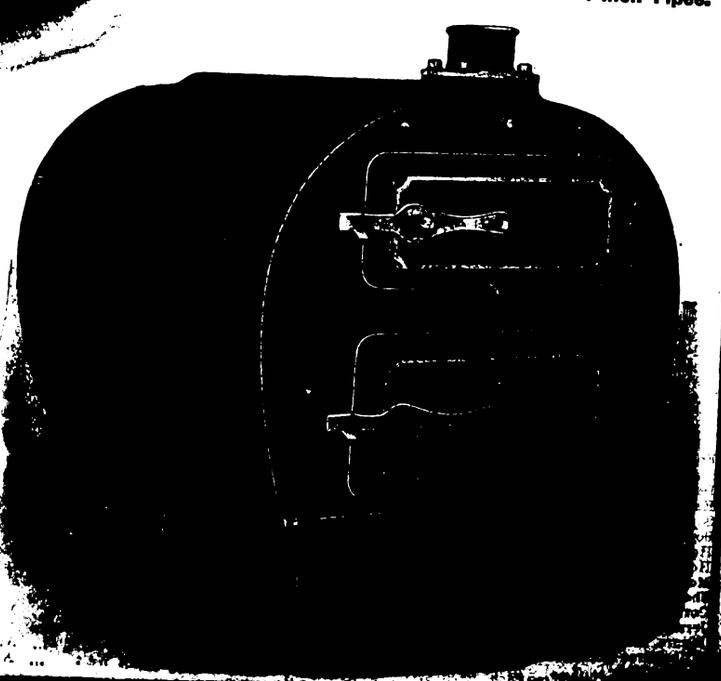


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Cathedrals and Abbeys of England—continued.

BRISTOL—*continued.*

Plan	October 6, 1899
East Side Cloisters	October 6, 1899
From Road looking South-East	October 6, 1899
Nave looking East	October 13, 1899
West Front	October 20, 1899
Detail of Front and West Door	October 20, 1899

WELLS.

Looking North-West from Wells	October 27, 1899
Choir looking East	October 27, 1899
North Porch and Tower	November 3, 1899
From Lady Chapel looking West	November 3, 1899
Looking North-East from Burial-ground	November 10, 1899
Details North Porch	November 10, 1899
Hugh Lugar's Chantry and South Aisle	November 17, 1899
The Triforium	November 24, 1899
The Lady Chapel	December 1, 1899
Bishop Bubwith's Chantry	December 8, 1899
Clock in North Transept	December 8, 1899
Steps to Chapter-house and Bridge	December 15, 1899
Tomb of Henry Husse, Dean 1302-05	December 15, 1899
Doorway, Chapter-house	December 22, 1899
View of Chapter-house, looking North-West	December 22, 1899
Section of Chapter-house	December 22, 1899
Bridge to Vicars Close	December 29, 1899

WESTMINSTER ABBEY.

Sixty Years Ago	January 5, 1900
Choir, looking East, Part North Transept	January 5, 1900
Entrance South Ambulatory	January 5, 1900
Triforium, North Transept	January 5, 1900
Tower and Buttresses from Cloisters	January 12, 1900
The Triforium	January 12, 1900
Choir looking East, Part South Transept	January 19, 1900
North Door	January 19, 1900
Transept looking North-East	January 26, 1900
Triforium, North Side of Sacrarium	January 26, 1900
Details North Porch	January 26, 1900
From South Transept looking North-East	February 2, 1900
North Ambulatory looking towards Henry VII.'s Chapel	February 2, 1900
Poets' Corner	February 2, 1900
Triforium, South Transept	February 9, 1900
North Side of Cloisters	February 9, 1900
Part Old Arcade, Chapel St. Edmund	February 9, 1900
Interior looking East Modern Screen	February 16, 1900
Details North Porch	February 16, 1900
South Ambulatory looking towards Henry VII.'s Chapel	February 23, 1900
North Ambulatory looking East	February 23, 1900
Abbot's Courtyard	February 23, 1900
Deanery and Corner of Cloisters	February 23, 1900
Bishop Islip's Chantry in North Ambulatory	March 2, 1900
Monks' Common Room	March 2, 1900
Crypt under Chapter-house	March 2, 1900
Chapel of St. Edmund, looking North-East	March 9, 1900
Entrance to Cloisters looking Dean's Yard	March 9, 1900
Tomb of Edward III.	March 9, 1900
Chapel St. John Baptist	March 16, 1900
View showing Porch	March 16, 1900
Bronze Gates	March 16, 1900
Cloisters and End South Transept	March 23, 1900
Entrance to Chapter-house	March 23, 1900
Shakespeare Memorial	March 23, 1900
Ambulatory to Henry VII.'s Chapel	March 30 1900
Doorway in Chapter-house	March 30, 1000
Arcade in Chapter-house	March 30, 1900
Chapel of St. Nicholas	April 6, 1900
Reredos from Confessor's Chapel	April 6, 1900
North Side, Confessor's Tomb	April 13, 1900
Abbot's Pew	April 13, 1900
North-East Side Confessor's Tomb	April 13, 1900
Chapel St. Edmund, looking North-West	April 20, 1900
Chapel of Pyx	April 20, 1900
Entrance to Little Cloister	April 20, 1900
Modern Reredos	April 27, 1900
Doors of Chamber of Pyx	April 27, 1900
Ancient Norman Capital	April 27, 1900
Tombs in Sacrarium	May 4, 1900
Gateway to Chapter-house	May 4, 1900
East Cloisters	May 4, 1900
Triforium, North Transept	May 11, 1900
End of Tomb of Henry VII.	May 11, 1900
Confessor's Shrine from North-West	May 11, 1900
Henry V.'s Chantry	May 18, 1900
Details	May 18, 1900
Tomb, Henry VII. and Queen Elizabeth	May 18, 1900
From Playground	May 25, 1900
Showing Tower and Roadway	May 25, 1900
Details of Stalls	June 1, 1900
Exterior	June 1, 1900
South Aisle	June 8, 1900
South Aisle looking West	June 8, 1900
Henry VII.'s Tomb	June 15, 1900
Henry VII.'s Tomb nd Chapel	June 15, 1900
Monuments of Duc de Montpensier	June 22, 1900
Showing Pendentive, &c.	June 22, 1900
Corner of Little Cloisters	June 29, 1900
Jerusalem Chamber	June 29, 1900
Figure, Mary Queen of Scots	June 29, 1900
Wilberforce Monument	June 29, 1900
Ground Plan	June 29, 1900

LICHFIELD.

Choir looking West	July 6, 1900
Nave looking East	July 13, 1900
West Doorway	July 20, 1900
View from West	August 10, 1900
West Front	August 17, 1900
Part Lady Chapel	August 24, 1900
South Door	August 31 1900
East End	August 31, 1900
North Transept Door	August 31, 1900
Portion of West Front	September 7, 1900
North Side of Nave	September 14, 1900
From Cathedral Close	September 21, 1900
Choir and Reredos	September 21, 1900
South Side of Nave and South Transept	September 21, 1900
Lady Chapel	September 28, 1900
From Minster Roof	October 5, 1900
South Choir Aisle	October 12, 1900
Showing Minstrel Gallery	October 19, 1900
Entrance to Chapter-house	November 2, 1900
The Reredos	November 30, 1900
The Transepts, looking North	December 7, 1900
North Nave Aisle, looking East	December 14, 1900
Detail of Corner of Front	December 14, 1900
One of the smaller West Doors	December 14, 1900
The Chapter-house Entrance	December 28, 1900
The Chapter-house Passage	December 28 1900
View in South Transept	December 28, 1900
Looking to Nave	December 28, 1900
Ground Plan	December 28, 1900

YORK.

General View of Exterior from South-East	January 4, 1901
General View from North-west	January 11, 1901
Detail of South-west end of Front	February 1, 1901
The Nave, to Organ Screen	February 8, 1901
View in North Transept, showing Clock and Triforium Windows	February 15, 1901
The Choir, half-length	February 22, 1901
From South-West	March 1, 1901
South Nave Aisle, looking East	March 8, 1901
South Choir Aisle, looking West	March 15, 1901
Entrance to the South Choir Aisle	March 22, 1901
The Choir to Organ Screen	March 29, 1901
The Great Stone Screen	April 5, 1901
View across Nave to North Transept	April 5, 1901
Detail of Nave Arches	April 12, 1901
Detail of Arcading under West Window	April 12, 1901
The Choir, full length to East Window	April 19, 1901
The Lady Chapel	April 26, 1901
Cross View to Nave from South Transept	May 3, 1901
View across Nave to South Transept, showing Font	May 10, 1901
The South Door	May 10, 1901
West End of Nave	May 17, 1901
West End of South Nave Aisle	May 31, 1901
South Choir Aisle, half length	June 7, 1901
The Chapter-house	June 21, 1901
The Chapter-house Door	June 28, 1901
Details in Chapter-house	June 28, 1901

CHICHESTER.

From St. Richard's Walk	July 5, 1901
The Screen and Choir	July 12, 1901
View from North-East	July 19, 1901
South Transept	July 26, 1901
Triforium, South-West Tower	August 2, 1901
Looking up the South-West Tower	August 2, 1901
Window Tracery, South Transept and Lady Chapel	August 9, 1901
Capitals, South Choir Aisle	August 16, 1901
Inside the Triforium looking West	August 23, 1901
South-West corner of Nave	August 30, 1901
East End of North Aisle	September 6, 1901
East Cloister and South Aisle	September 13, 1901
North Aisle, Looking West	September 20, 1901
Tower and South Transept	September 27, 1901
Ancient Sculpture in Wall of South Choir Aisle	October 4, 1901
The Raising of Lazarus	October 4, 1901
East End of Retro-Choir	October 18, 1901
The Lady Chapel	October 18, 1901
Cloisters and South-west Tower	October 18, 1901
Tower and East End of Choir	October 25, 1901
Triforium, North-east Corner of Retro-Choir	October 25, 1901
Chapel of St. Clement	November 1, 1901
Looking into South Aisle of Nave	November 1, 1901
One Bay of Nave Triforium	November 1, 1901
North Transep and Campanile	November 15, 1901
South Door in Cloisters	November 15, 1901
East End of South Cloister	November 15, 1901
Triforium, &c., from West Window	November 22, 1901
West End of South Aisle	November 22, 1901
The Reredos	November 29, 1901
The Library	November 29, 1901
East End of Lady Chapel	December 6, 1901
West End of Lady Chapel	December 6, 1901
The Nave	December 13, 1901
Nave Arches	December 13, 1901

RIPON.

General View of Exterior from South-East	January 3, 1902
The Choir to East Window	January 17, 1902
The Nave, looking West	January 31, 1902
General View, from the River	February 14, 1902
The Three Stone Sedilia	March 7, 1902
The Rood-Screen between Nave and Choir	March 28, 1902
The South Nave Aisle, looking East	April 4, 1902
The Choir, looking West	April 18, 1902

RIPON—*continued.*

View of the South Side of Nave	May 2, 1902
North Side of the Nave, showing Double Buttresses	May 2, 1902
General View of Nave to Organ Screen	May 16, 1902
Portion of North Transept, showing Old Stone Pulpit	June 6, 1902
The South Transept	June 6, 1902
The West Front	June 13, 1902
The West Entrance	June 13, 1902
South Choir Aisle, looking West	June 27, 1902

HEREFORD.

View from North-West	July 4, 1902
View from South-East	July 11, 1902
View from North-East	July 18, 1902
Nave Arches, North Side	July 25, 1902
South Aisle, looking East	August 1, 1902
From South Aisle, looking into North Transept	August 1, 1902
East End	August 8, 1902
South Side of Lady Chapel	August 8, 1902
North Porch	August 15, 1902
South Transept and Cloisters	August 15, 1902
The Nave	August 22, 1902
East End of South Choir Aisle	September 5, 1902
The High Altar	September 5, 1902
The Retro-Choir	September 19, 1902
In South-East Transept	September 19, 1902
The Choir Screen	October 10, 1902
From North Choir Aisle, looking South-East	October 17, 1902
The Cloisters and the Ladye Arbour	November 7, 1902
The Vicars' Cloisters	November 7, 1902
Looking into North Transept	November 14, 1902
East Wall of North Transept	November 21, 1902
The North Door	November 28, 1902
A Coffin Lid	November 28, 1902
East Wall of South Transept	December 5, 1902
Ball Flower Ornament on Tomb in North-East Transept	December 12, 1902
Four-Leaved Flower Ornament on Tomb in North noir Aisle	December 12, 1902
Corner of North Transept	December 19, 1902
Gargoyle in Cloisters	December 19, 1902
North Wall of Lady Chapel	December 26, 1902
Diaper Work and Capitals in North Transept	December 26, 1902

WORCESTER.

From North-East	January 2, 1903
The Choir, looking West	January 9, 1903
South Transept and Tower	January 16, 1903
Cloisters and Tower	January 23, 1903
The Nave	January 30, 1903
East End of Prince Arthur's Chantry. Details of Prince Arthur's Chantry	February 6, 1903
Looking North-West across the Nave	February 13, 1903
Entrance to Cloisters. Bosses in Cloister Vaulting	February 20, 1903
Capitals in South Transept. The Crypt	February 27, 1903
The High Altar	March 13, 1903
Nave Arches and North Transept	March 27, 1903
The West Door. The North Porch	April 10, 1903
From Lady Chapel, looking into South-East Transept	April 17, 1903
Chapel of St. John	May 1. 1903
Cloisters and South Transept	May 15, 1903
Looking into North Transept	May 29, 1903
South-East Transept	June 19, 1903
Looking into Lady Chapel	June 19, 1903
The Screen and Choir	June 19, 1903
North Cloister	June 26, 1903
The Chapter-House	June 26, 1903
South Door in Cloisters	June 26, 1903

EXETER.

The West Front	July 3, 1903
The Choir, looking East	July 10, 1903
The Choir Screen	July 17, 1903
The North Tower and North Porch	July 24, 1903
The Nave, looking West	July 31, 1903
Window Tracery, North and South Side of Choir	August 7, 1903
View from South-East	August 14, 1903
Details of West Front	August 21, 1903
Chapter-house and Cloisters. South Tower, from Palace Garden	September 4, 1903
Sylke's Chantry and Chapel of St. Paul	September 11, 1903
West End of Lady Chapel	September 25, 1903
South Aisle, looking East	October 9, 1903
South Aisle	October 16, 1903
Nave Vaulting	October 23, 1903
Speke Chantry, and Chapel of St. Mary Magdalene	October 30, 1903
St. Gabriel's Chapel and End of Bishop Oldham's Chantry	November 6, 1903
North Transept and Clock	November 13, 1903
Nave, looking East	November 20, 1903
The Nave Arches	November 27, 1903
Chancel, and Screen to North Aisle	December 4, 1903
East End of Lady Chapel	December 11, 1903
The Choir	December 18, 1903
High Altar and Sedilia	December 25, 1903

CHESTER.

View from South-East	January 1, 1904
Tower, Flying Arches and Buttresses	January 15, 1904
Mosaics in Aisle	January 29, 1904
The Cloisters. Doorway in Cloisters	February 12, 1904

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Cathedrals and Abbeys of England—continued.

CHESTER.

The Choir	March 25, 1904
Detail of Choir Stalls	April 1, 1904
The Sedilia. Reader's Pulpit in Refectory	April 15, 1904
The Crypt	April 22, 1904
The Nave, looking North-East ...	April 29, 1904
Vestibule to Chapter-House. Window and Door at South End of West Aisle of South Transept...	May 6, 1904
General View of Nave	May 20, 1904
South Cloister. The Cloisters ...	May 27, 1904
West End of South Wall of Refectory, and North-West Angle of Cloisters	June 3, 1904
Clerestory of Nave and Flying Buttresses. North-West Porch and Base of North-West Tower. Doorway at West End of Nave. Abbey Gateway	June 10, 1904
General View of Choir	June 17, 1904
North-East View	June 24, 1904
The Chapter-House	July 1, 1904
South Aisle, The Pulpit	July 15, 1904
The Crossing, looking North-East	July 22, 1904
The Reredos...	July 29, 1904
The Cloisters	August 5, 1904
North-East View. North Transept, with Tomb of Bishop Pearson	August 12, 1904

BANGOR.

General Exterior (South Side) ...	August 19, 1904
Chancel and Nave from Altar ...	August 26, 1904
General Exterior (North Side) ...	September 9, 1904
Interior of Central Tower ...	September 23, 1904
North Side of Choir	October 7, 1904
South Aisle from West End ...	October 28, 1904
General Interior. Nave, and Chancel from West End ...	November 11, 1904
Nave from Chancel	November 25, 1904
South Aisle from East End ...	December 2, 1904
Chancel from Nave	December 9, 1904
North Side of Choir	December 16, 1904

ST. ASAPH.

General Exterior from South-West Corner looking North-East	January 6, 1905
The West Door	January 20, 1905
Interior from West End	February 3, 1905
General Interior from East End	February 17, 1905
Chancel from Nave	March 3, 1905
General Exterior, North Side ...	March 17, 1905
South Aisle from West End looking North-East	March 31, 1905
Nave from Chancel	May 5, 1905
The Altar	June 2, 1905
View across Nave looking South-East	June 23, 1905
The Choir, North Side. Interior of Chapter-House	June 30, 1905

WAKEFIELD.

Chancel and Nave from East End	July 7, 1905
Recent Extension at East End ...	July 21, 1905
Detail of Screen	August 4, 1905
Chancel Arch and Screen... ...	August 18, 1905
The South Choir	September 1, 1905
One of Two Carved Wood Screens, with Doors to the New St. Mark's Chapel... ...	September 15, 1905

WAKEFIELD—*continued.*

North Choir and New Part of Organ	September 22, 1905
Groined Ceiling, St. Mark's Chapel (Modern)	September 29, 1905
St. Mark's Chapel, West End (recent addition)...	October 6, 1905
Nave and Chancel from West End	October 20, 1905
View from South-East Corner of South Aisle, looking North-West	November 3, 1905
View from North Transept across Sanctuary to South Transept ...	November 10, 1905
Altar and Reredos	November 17, 1905
Part of South Transept	November 24, 1905
St. Mark's Chapel	December 1, 1905
General Exterior	December 8, 1905
The Chancel	December 15, 1905
General Interior, looking East ...	December 22, 1905
Effigy of the late Bishop How ...	December 29, 1905

TRURO.

View of the North Side	January 5, 1906
View of East End from the Bridge	January 19, 1906
The North Side, showing Central Tower and Spire...	February 2, 1906
View from North-West	February 9, 1906
South Choi Aisle	February 16, 1906
Baptistery from the South-West	February 23, 1906
Interior of Baptistery and Font ...	March 9, 1906
View of North Transept	March 23, 1906
West Front, South Porch ...	April 6, 1906
Bishop's Throne and South Side of Choir and Nave	April 20, 1906
East End showing Reredos ...	May 11, 1906
The Sanctuary, High Altar, Reredos and Sedilia	May 18, 1906
Nave and West End with Gallery	June 1, 1906
The Nave, looking West	June 22, 1906
Full Length View, looking East...	June 29, 1906

ST. DAVIDS.

View from South-East	July 6, 1906
West Front and part of ruined College of St. Mary. Exterior of Lady Chapel	July 13, 1906
View of Nave from West Door ...	July 20, 1906
The Choir and Parclose Screen from North-East. The Lady Chapel	August 3, 1906
The Triforium and Clerestory from top of Rood Screen. The Rood Screen	August 10, 1906
From South-West (showing South Porch and South Transept). Exterior from South-East ...	August 17, 1906
The Nave, looking West	August 24, 1906
The Choir, Eastwards	August 31, 1906
Showing North Door. The Choir, Westwards	October 5, 1906
The Choir, Westwards from High Altar	October 12, 1906
View across Nave from South Door. South Choir Aisle from South Transept	October 19, 1906

MANCHESTER.

From South-East	October 26, 1906
New Chapter-House from South-East	November 2, 1906
View across Nave from South-East, showing Double Nave Aisle	November 9, 1906

MANCHESTER—*continued.*

South-East Corner, showing Old Chapter-House	November 16, 1906
The South Porch and Tower ...	November 23, 1906
Old Chapter-House Door in South Choir Aisle	November 30, 1906
The Choir, Eastwards	December 7, 1906
The Nave, Eastwards	December 14, 1906
The Choir, Westwards	December 21, 1906

CARLISLE.

Exterior from South-West ...	January 11, 1907
Remains of Norman Nave ...	January 18, 1907
Tower and South Transept ...	January 25, 1907
The East Window	February 15, 1907
View of Choir looking East ...	February 22, 1907
South Aisle looking East	March 8, 1907
Exterior of Choir from South-West	March 15, 1907
Exterior from South-East... ...	March 22, 1907
South Transept Door	April 12, 1907
The Choir, Triforium, and Clerestory (South Side)	April 26, 1907
South Aisle looking West... ...	May 17, 1907
View from South Transept showing Norman Arch	May 31, 1907
View of Choir looking West ...	June 14, 1907
The Choir from Organ Loft (the East End)	June 21, 1907
View across Transepts from South	June 28, 1907

SOUTHWARK.

View of Exterior	July 5, 1907
View of Chancel	July 19, 1907
The New Harvard Chapel. The Gower Monument	August 2, 1907
The Lady Chapel	August 16, 1907
North Side of Chancel, showing Triforium	September 6, 1907
North Transept	September 20, 1907
The Nave from the Chancel ...	October 4, 1907
The Nave, looking East	October 18, 1907
North Aisle	November 15, 1907
North Choir Ambulatory	November 29, 1907
Nave, looking West...	December 6, 1907
North Transept from South ...	December 13, 1907
Fox's Screen	December 20, 1907

OXFORD.

The Cloisters and Cathedral ...	January 3, 1908
View from the Garden	January 17, 1908
The Latin Chapel	February 7, 1908
South Transept and Lady Chapel	March 6, 1908
North Aisle	March 20, 1908
The Nave	April 3, 1908
Norman Arch and Cloisters ...	April 10, 1908
The Choir	April 17, 1908
Interior, looking East	April 24, 1908

NEWCASTLE.

View from Castle Ramparts ...	May 1, 1908
Bishop's Throne, and one Bay of Choir Stalls	May 8, 1908
Screen and Sedilia...	May 15, 1908
Choir Screen from West	May 22, 1908
Full-Length View Eastwards ...	May 29, 1908
The Nave, Westwards	June 5, 1908
Organ in North Transept	June 12, 1908
Font and Tower Arch on South Side...	June 19, 1908
Full-Length View Westwards ...	June 26, 1908

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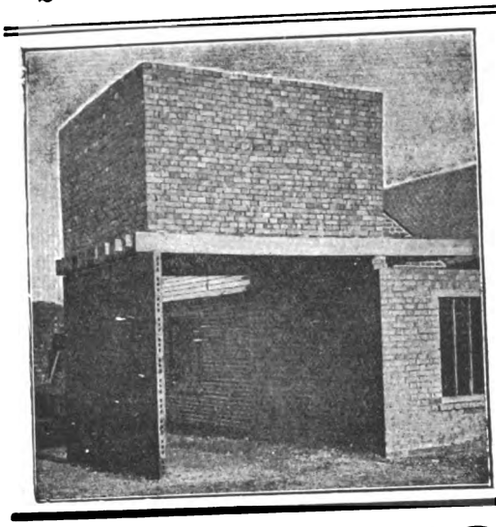
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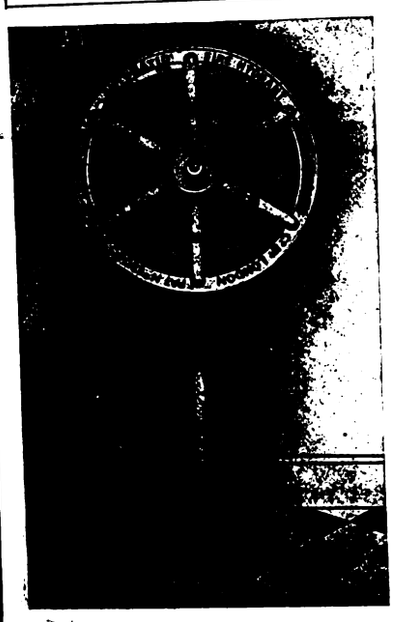
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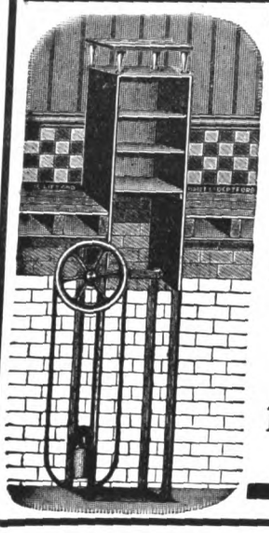
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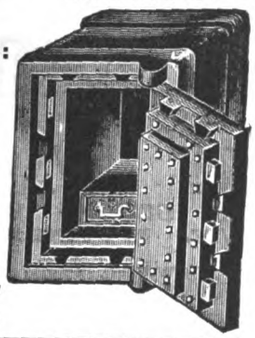
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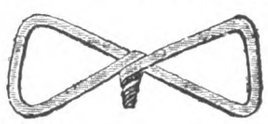
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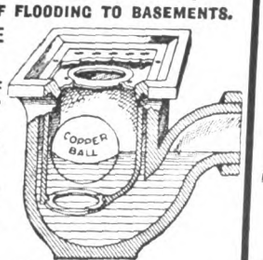
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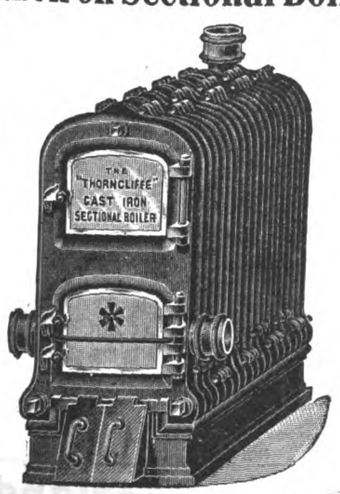
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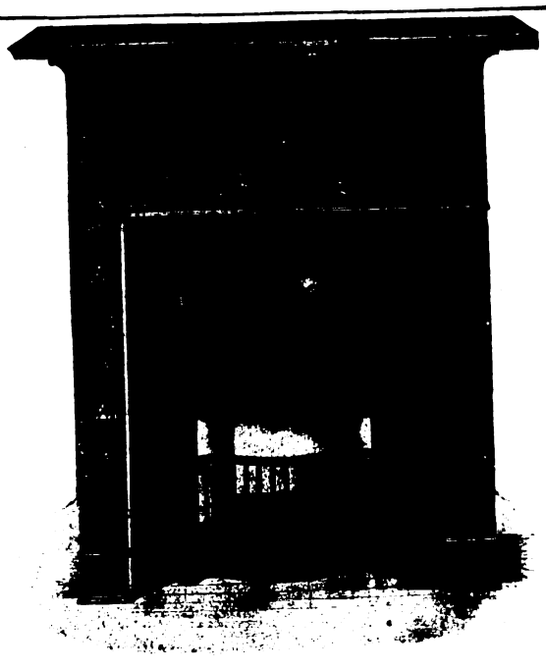
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FOREST HALL.—Aug. 30.—The Northumberland education committee invite designs from architects practising in Northumberland and Newcastle for an elementary school for 250 scholars. Mr. C. Williams, secretary, The Moothall, Newcastle-on-Tyne.

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Barrow-in-Furness.—Aug. 23.—For alterations required at the Roose Road branch of the Barrow Co-operative Society, Ltd. Mr. E. M. Young, architect, Duke Street, Barrow-in-Furness.

Batley.—Aug. 28.—For reconstructing and repairing greenhouses, for the Corporation. Mr. O. J. Kirby, borough surveyor.

Belfast.—Aug. 30.—For erection of offices, Waring Street, for the Clyde Shipping Company, Ltd. Messrs. Watt, Tulloch & Fitzsimons, architects, 77A Victoria Street, Belfast.

Birmingham.—Aug. 24.—The Commissioners of His Majesty's Works and Public Buildings invite schemes and tenders based thereon for the reinforced concrete portions of the Birmingham Head Post Office. Any system or systems of construction may be adopted for the whole or any part of the work. Deposit 1*l.* 1*s.* Mr. J. Rutherford, the Board's architect, 17 Delahay Street, S.W.

Bovey Tracey (Devon).—Aug. 25.—For erection of a farmhouse at Elsford, Bovey Tracey; also for additions to Riley Farm House, Hennock. Mr. Samuel Segar, F.I.A.S., architect, 24 and 26 Union Street, Newton Abbot.

Blundeston.—Aug. 23.—For erection of a Wesleyan chapel, Blundeston, near Lowestoft. Mr. R. Scott Cockrill, A.R.I.B.A., Crossley House, London Road, Lowestoft.

Bradford.—Aug. 30.—For all trades required in forming bathroom, dressing room and douche baths at the Bowling Back Lane school, for the Corporation. The City Architects, Whitaker Buildings, Brewery Street, Bradford.

Burnley.—Sept. 8.—For the several works in connection with erection of a nurses' home and alterations of the infirmary, Rakehead. Messrs. G. & S. Keighley, architects, Nicholas Street, Burnley.

Cheltenham.—Aug. 27.—For alterations and additions at No. 91 High Street. Mr. Thomas Malvern, architect, 21 Winchcombe Street, Cheltenham.

Chopwell.—Aug. 21.—For the erection and completion of six shops, &c. Mr. D. M. Spence, architect and surveyor, Shotley Bridge.

Cleator Moor.—For the erection of a roller-skating rink. Mr. J. Harker, Earl Street, Cleator Moor.

Colchester.—Aug. 21.—For erection of new technical institute. Deposit 5*l.* Send names to Mr. H. A. Cheers, Twickenham, London.

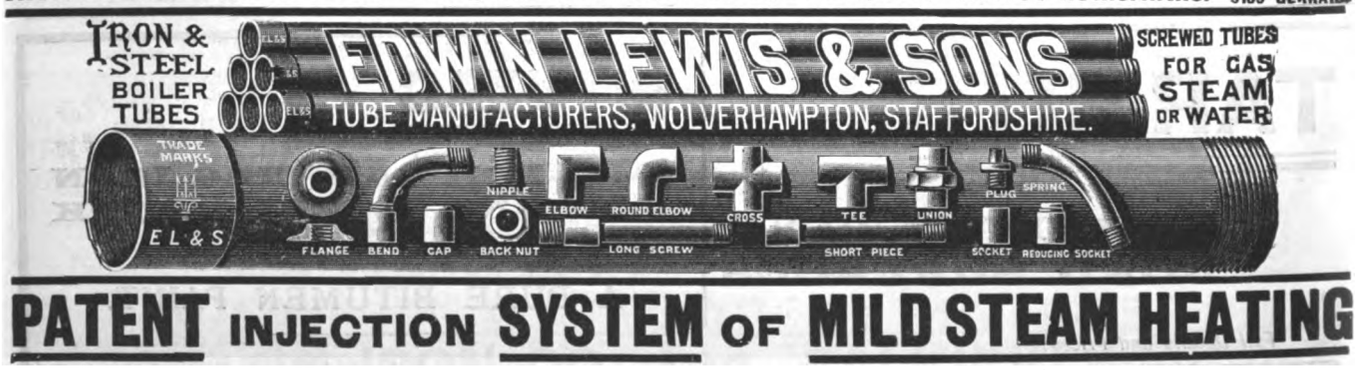
Cottingham.—Aug. 24.—For the whole of the works required in erection of a shed and boundary wall at Market Green. Mr. J. H. Hanson, surveyor, Market Green, Cottingham, Hull.

Dublin.—Aug. 31.—For erection of an additional refuse destructor at the Depot, Stanley Street. Deposit 1*l.* 1*s.* Mr. Fred J. Allan, secretary, cleansing committee, 3 Cork Hill, Dublin.

Dublin.—Sept. 1.—For additions and alterations at the Royal Hibernian Military School, Dublin. Deposit 1*l.* Mr. H. Williams, secretary, Office of Public Works, Dublin.

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EASTLEIGH (HANTS).—Aug. 23.—For the following contracts in connection with boys' and girls' elementary school, Eastleigh, 800 children. Contract No. 1:—Erection of a school of two floors to accommodate 800 children. Deposit 5*l.* 5*s.* Contract No. 2: For construction of about 900 square yards of Hennebique concrete flooring in the new school. Deposit 2*l.* 2*s.* Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

ECCLES.—Aug. 21.—For erection of a secondary and technical school at Park Road, Monton. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

GREAT TORRINGTON.—Aug. 27.—For alterations at Torrington Police Station, Devon, and erection of a superintendent's house. Deposit 3*l.* Mr. E. H. Harbottle, county surveyor, Queen Street, Exeter.

HADLEIGH (ESSEX).—Sept. 8.—For the erection of a school at Hadleigh (near Southend-on-Sea) to accommodate 220 children, for the Essex education committee. Deposit 2*l.* 2*s.* Apply, by August 23, Mr. F. Whitmore, architect, 73 Duke Street, Chelmsford.

IRELAND.—Aug. 23.—For building twenty-two cottages at Newtownmountkennedy, Co. Wicklow, for the Rathdrum Rural District Council. Deposit 1*l.* 1*s.* Mr. Geo. T. Moore, A.R.C.S.I., M.I.C.E.I., engineer, 1 and 2 Foster Place, Dublin.

IRELAND.—Aug. 25.—For rebuilding branch bank and residence at Edenderry, for the Hibernian Bank, Ltd. Deposit 2*l.* 2*s.* Mr. William Butler, surveyor, 58 Mountjoy Square, Dublin.

IRELAND.—Aug. 30.—For the erection of a manse at Alliance Avenue, Oldpark. Messrs. Young & Mackenzie, Scottish Provident Buildings, Belfast.

KEIGHLEY.—Aug. 27.—For the enlargement of the head post office. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

KETTON.—For the erection of a new oak lych-gate to the Ketton Churchyard, and also for the rebuilding of the churchyard wall. Deposit 1*l.* 1*s.* Mr. H. F. Traylen, architect, 16 Broad Street, Stamford.

KINGSTON-ON-THAMES.—Aug. 31.—For a small addition to the laundry drying-room at the workhouse infirmary. Mr. William H. Hope, C.E., architect and surveyor, 12 Clarence Street, Kingston-on-Thames.

LEEDS.—For the erection of two houses in Stoneyrock Road. Send names to Mr. John E. Stocks, architect and surveyor, Greek Street Chambers, Park Row, Leeds.

LEEDS.—Aug. 24.—For the joiner's, builder's and plumber's work required at the Town Hall, Municipal Buildings and judges' house, Clarendon Road. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

LONDON.—Aug. 31.—For erection of the Central London Recruiting Depot, Old Scotland Yard, S.W. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

LONDON.—Sept. 1.—For the construction of isolation rooms at the Eastern Fever Hospital, Homerton, N.E., for the Metropolitan Asylums Board. Messrs. T. W. Aldwinckle & Son, architects, 20 Denman Street, London Bridge, S.E.

LONDON.—Sept. 29.—For the erection of a public convenience in Avenue Gardens, Station Road, Wood Green, N. Deposit 1*l.* 1*s.* The Surveyor, Town Hall, Wood Green.

LUTON.—Aug. 26.—The Town Council invite constructional schemes and tenders based thereon for reinforced concrete floors and a circular dome in connection with the new public library. The Borough Engineer's Office, Town Hall, Luton.

MANCHESTER.—Sept. 1.—For the construction of an underground lavatory for males at the Poultry Market, Shudehill. Deposit 1*l.* 1*s.* The City Surveyor, Town Hall, Manchester.

MANCHESTER.—Aug. 24.—For erection of wash baths and washhouses, Armitage Street, Ardwick. Deposit 2*l.* 2*s.* The City Architect, Town Hall.

MARYPORT.—Aug. 27.—For the various works required in alteration to Central Stores. Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

MILTON (CAMBS).—Aug. 21.—For erection of a house and buildings. Mr. H. H. Dunn, county architect, Central Chambers, Cambridge.

NORTHALLERTON.—Aug. 31.—For alterations and improvements to (1) Stanghow Lane School, Mr. J. H. Fletcher,

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school caretaker, 68 High Street, Skelton-in-Cleveland; (2) Stainton Council school, Mr. J. Jackson, school correspondent, Stainton, Thornaby-on-Tees; (3) Guisborough Northgate school, Mr. J. Grant, schoolmaster, Guisborough Northgate school.

Preston.—Aug. 21.—For taking down the existing buildings between the County Council offices in Fishergate Hill and the Constabulary Offices in Jordan Street, and erecting new offices on the site. Deposit 3*l*. Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Randwick.—Aug. 28.—For alterations and additions at Randwick Church schools, Stroud. Mr. G. P. Milnes, A.M.I.C.E., architect, 6 Rowcroft, Stroud.

Rawtenstall.—Sept. 1.—For the whole of the works and materials comprised in the construction and erection of public conveniences at Queen's Square. Deposit 1*l*. 1*s*. Mr. James Johnson, C.E., borough surveyor, Municipal Offices, Rawtenstall.

Royston.—Sept. 6.—For erection and completion of a County Council school at Royston, Herts (accommodation, 428). Deposit 2*l*. 2*s*. Mr. Urban A. Smith, county surveyor, Hatfield.

Sandwich.—Aug. 25.—For repairs at the Council school and teachers' dwelling-house. Mr. F. S. Cloke, correspondent, Salisbury House, Strand Street, Sandwich, Kent.

Stafford.—Aug. 21.—For erection and completion of a Council school for 520 children in Tenter Banks. Deposit 1*l*. 1*s*. Apply to Mr. Graham Balfour, director of education, County Education Offices, Stafford

Wales.—Aug. 23.—For erection of a Presbyterian chapel hall and schoolrooms at Abercynon. Apply to Mr. Arthur Lloyd Thomas, architect and surveyor, Pontypridd.

Wales.—Aug. 23.—For the work required in the erection of a stable and cart shed at Beaufort and a bandstand at Ebbw Vale. Deposit 10*s*. Mr. T. J. Thomas, town engineer and surveyor, Ebbw Vale.

Wales.—Aug. 23.—For six cottages and additions to eight others at Whitchurch, near Cardiff. Mr. Sidney Williams, M.S.A., architect and surveyor, Wharton Street, Cardiff.

Wales.—Aug. 25.—For alterations and extensive renovations to the Royal Garrison Artillery Drill Hall premises at Barry Dock, Glamorgan. Deposit 10*l*. Mr. W. H. Dashwood Caple, architect, 2 Church Street, Cardiff.

Wales.—Aug. 25.—For work required in completing four pairs of semi-detached villas and ten cottages at Hirwain, Glam. Mr. J. B. Young, Estate Offices, Hirwain.

Wales.—Aug. 30.—For erection and completion of forty-five houses and formation of road, surface-water drains, &c., at Chepstow Road, Pencelli, Treorky, Rhondda Valley, for the Pencelli Building Club. Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre.

Wales.—Sept. 1.—For erection of a caretaker's house in connection with the Public Library, Penarth. Deposit 1*l*. 1*s*. Mr. H. Snell, architect, 13 Hickman Road, Penarth.

Wales.—Sept. 3.—For structural alterations and repairs at the Town Hall, Pembroke. Mr. R. D. Lowless, town clerk, Pembroke.

Walkden (Lancs).—Aug. 30.—For the labour and materials required in erection of public offices and a public hall. Deposit 2*l*. 2*s*. Mr. J. T. Proffitt, architect, 9 Longley Road, Walkden.

Warrington.—Aug. 24.—For erection of an administrative ward at the Sankey Hospital. Deposit 1*l*. 1*s*. The Surveyor, Town Hall, Warrington.

Waterfoot.—Sept. 1.—For the works and materials in the erection of a market hall at Waterfoot, Rawtenstall (Lancs). Deposit 2*l*. 2*s*. Mr. James Johnson, C.E., borough surveyor, Municipal Offices, Rawtenstall.

Wigglesworth.—Aug. 23.—For erection of a Wesleyan chapel at Wigglesworth, Yorks. Rev. P. Back, the Wesleyan School, Settle.

Winchester.—Sept. 1.—For erection of the central hall and other works at Peter Symonds's school. Messrs. Cancellor & Hill, architects, 12 Jewry Street, Winchester.

Wrexham.—Aug. 24.—For the construction of a convenience on land off Town Hill, and also the removal from Brook Street of an iron convenience and its re-erection in Tenter's Square. Separate tenders. Mr. John England, borough engineer, Willow Road, Wrexham.

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TENDERS.

BATH.

For the construction of lavatories and cloakrooms in connection with the technical and city secondary schools, and for replacing the provision for the women in the market, and also for extending the heating arrangements, for the Town Council.

Webb	£2,757 0 0
Blackmore	2,725 17 3
Chancellor & Sons	2,581 19 0
Howard, Son & Parsons	2,533 10 0
Amery	2,411 5 0
Burden & Clark	2,401 0 0
Erwood & Morris	2,326 10 0
Hayward & Wooster	2,294 6 0
Long & Sons (*accepted*)	2,188 0 0

Fire escape staircase in connection with the above work.

Chancellor	157 8 0
Howard, Son & Parsons	155 0 0
Hayward & Wooster	159 5 0
Erwood & Morris	157 18 0
Burden & Clark	159 0 0
Long & Sons (*accepted*)	147 0 0

CHINGFORD.

For making-up, paving, kerbing, lighting, &c., the Forest Avenue, a portion of Gordon Road and the cartway at the rear of Connaught Road, for the Chingford Urban District Council. Mr. J. T. Griffin, surveyor.

Free & Sons	£1,381 0 0
Adams	1,188 14 0
Wilson, Border & Co.	1,181 0 0
W. & C. French	1,117 0 0
Greenfield, Enfield (*accepted*)	1,091 11 6
Wilson	1,084 0 0

CHICHESTER.

For new elementary schools Orchard Street. Mr. Haydn P. Roberts, A.R.I.B.A., County Education architect, Horsham.

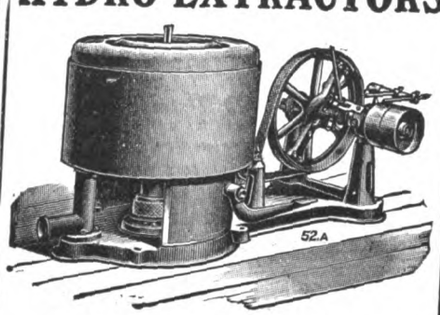
Briggs	£12,136 0 0
F. W. Potter	10,700 0 0
Crane	10,640 8 6
Lindfield & Son	10,150 0 0
W. Potter	9,745 0 0
G. Potter	9,850 0 0
Vick & Sons	9,819 0 0
Hillman & Murrell	9,700 0 0
Rowland Bros.	9,589 0 0
E. & A. Spriggings	9,466 0 0
Salter	9,425 0 0
Hockley & Co.	9,405 0 3
Minter	9,389 0 0
Wallis	9,367 0 0
Privett	9,247 0 0
McKellar	8,997 0 0
Longley & Co.	8,988 0 0
Pethick Bros.	8,884 0 0
Cook & Sons	8,872 0 0
Sandell & Sons, Worthing (*accepted*)	8,650 0 0
Roberts	8,598 0 0
Architect's estimate	9,397 0 0

COLCHESTER.

For the erection of a covered stand upon the newly leased ground at Layer Road, for the Colchester Town Football Club.

Motum	£156 0 0
Chambers	128 17 6
Everett & Son	128 0 0
Cook	127 10 0
Shepherd & Son	126 10 0
Dobson	126 0 0
Diss (*accepted*)	125 0 0

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COOKHAM DEAN.

For proposed gardener's cottage at Cookham Dean. Mr. H. Stanton Webber, F.S.I., architect and surveyor, Maidenhead and Marlow.

Taft	£356 12 0
Harding	340 0 0
W. & T. Sellman, Marlow (*accepted*)	295 0 0

DAGENHAM.

For additions and alterations to Ford's School, Dagenham, for Ford's Charitable Bequest.

Bruty	£3,300 0 0
Goolaston	3,040 0 0
Eyles	3,004 15 0
Spencer, Santo	2,968 11 7
Hughes	2,957 0 0
Smith & Sons	2,921 0 0
Dowsing, Davis	2,887 0 0
Nightingale	2,872 0 0
Hawksey & Oldman	2,857 0 0
Patrick	2,843 0 0
Death	2,839 0 0
Moss	2,825 0 0
Sedcole	2,797 0 0
Irwin	2,733 0 0
Hall & Upson	2,630 0 0
Pasterfield & English	2,543 0 0
Brown Bros.	2,443 0 0
Pavett & Sons	2,416 0 0

GODSTONE.

For the erection of extra hospital accommodation at the union workhouse. A, original tenders; B, amended tenders.

	A	B
Pink	£654 0 0	£611 0 0
Dives	612 0 0	657 10 6
Hawkins	566 0 0	598 0 0
Honour	530 0 0	544 10 0
Cooper	523 0 0	607 0 0
Ginger, Lee & Co.	—	598 10 0

Consideration of the tenders was adjourned.

GILMERTON (SCOTLAND).

For works in connection with proposed addition to and alterations on Gilmerton police station, for the Midlothian County Council. Mr. R. Murray, surveyor, Edinburgh.

Accepted tenders.

Wilson, Niddrie, mason	£300 0 0
Wilson, Portobello, joiner	253 0 0
Moonie, Corstorphine, plumber	91 0 0
P. F. Cavanagh's Trustees, Edinburgh, plasterer	82 0 0
Hogg & Marshall, Portobello, slater	37 16 2
P. & J. Gordon, Edinburgh, painter	30 15 6

HYTHE.

For erecting a special subjects room at the Council school. Mr. Wilfrid H. Robinson, architect to the Kent committee.

Lawrence	£741 0 0
Hayward & Paramor	698 0 0
Hoskins	698 0 0
Scott Bros.	635 10 0
Wise	529 0 0
Jenner	495 0 0
Howland, Aldington (*accepted*)	468 0 0

IPSLEY.

For sewage disposal works, for Redditch Urban District Council. Mr. A. J. Dickinson, engineer and surveyor, Redditch.

Woodcock & Riley	£9,436 0 0
Currall, Lewis & Martin	9,125 0 0
Huins & Son	8,790 0 0
Johnson Bros.	8,790 0 0
Shrimpton	8,710 0 0
Price & Co.	8,589 0 0
Tilt Bros.	8,585 14 6
Meredith	8,285 0 0
Cunliffe & Sons	8,010 0 0
Trentham	7,832 16 2
J. & A. Brazier	7,600 0 0
Mason	7,469 9 11
Vale & Sons, Stourport (*accepted*)	7,385 0 0



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KIRKBURN.

For additions to the Primitive Methodist chapel. Mr. J. Shepherdson, architect, Driffield.

Dry	£298	0	0
Naylor	287	0	0
Leason & Son, Driffield (*accepted*)	245	0	0

LONDON.

For warehouse building, Goswell Road and Compton Street, E.C. Mr. W. Leonard Dowton, architect, City Bank Chambers, Bedford Row, W.C.

Andrews & Co.	£5,123	0	0
Mason & Co.	4,688	0	0
Marsland & Sons	4,574	0	0
Courtney & Fairbairn	4,547	0	0
Rice & Son	4,545	0	0
Denne & Son	4,456	0	0
Groves & Son	4,432	0	0
Mattock & Parsons	4,427	0	0
Patman & Fotheringham	4,381	0	0
Parker & Sons	4,365	0	0
Redhouse & Son	4,344	0	0
Roome & Co.*	4,203	0	0
Chessum & Sons	4,197	0	0

* Accepted subject to revised price, viz. 4,120*l.*

For alterations to the Vine Street Police Station. Mr. J. Dixon Butler, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard, S.W.

Prestige & Co.	£4,486	0	0
Mowlem & Co.	4,483	0	0
Foster & Dicksee	4,457	0	0
Grover & Son	4,277	0	0
Patman & Fotheringham	4,243	0	0
Kilby & Gayford	4,200	0	0
Ashby & Horner	4,110	0	0
Trollope & Sons and Colls & Sons	4,095	0	0
F. & H. F. Higgs	4,054	0	0
Higgs & Hill	4,049	0	0

LONDON—*continued.*

For construction of assembly hall and other additions to Bacon's schools, Grange Road, Bermondsey. Mr. J. Moir Kennard, architect, 13 Railway Approach, London Bridge, S.E.

Greenwood	£867	0	0
Renwick	838	0	0
White & Co.	827	0	0
Whiter & Co. (*accepted*)	746	0	0

For the extension of the Acton Cottage Hospital.

Bolton, Chiswick (*accepted*)	£980	0	0

NEW MALDEN.

For the following works for the Maldens and Coombe Urban District Council, Surrey:—Contract No. 1: For making-up carriageway and a tarred gravel footway in Wellington Crescent; Contract No. 2: paving with artificial stone slabs the footway on the north and west sides of Wellington Crescent, and the construction of a hardcore foundation. Mr. Reginald H. Jeffes, A.M.I.C.E., engineer and surveyor.

Contract No. 1.

Dykes	£999	0	0
Griffiths & Co.	966	3	9
Free & Sons	949	7	8
Mowlem & Co.	895	0	0
E. & E. Iles	874	15	4
Thacker & Co.	820	0	0
Thomas & Son	797	8	4
Kavanagh & Co., Surbiton Hill (*accepted*)	779	16	4
Engineer and surveyor's estimate	788	3	10

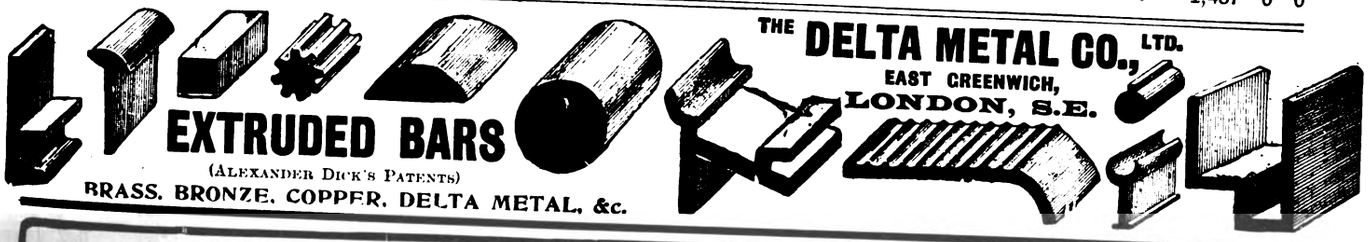
Contract No. 2.

Ellis & Sons, Leicester (*accepted*)	81	13	4
Engineer and surveyor's estimate	80	0	0

PURLEY.

For building a house in Riddlesdown Road. Messrs. Worsfold & Hayward, architects, 80 Cannon Street, E.C.

Roffey & Sons	£2,295	0	0
Roome & Co.	1,673	0	0
Grace & Marsh	1,557	0	0
Everitt	1,520	0	0
Whiter & Co. (*accepted*)	1,487	0	0



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NORTHWOOD.

For the erection of a police station. Mr. J. Dixon Butler, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard, S.W.

Messom & Son	£5,321 0 0
Godson & Sons	5,300 0 0
Potterton	5,300 0 0
G. & J. Waterman	5,269 0 0
Page	5,059 0 0
Fassnidge & Sons	5,003 0 0
Hill Bros.	4,994 0 0
Haynes	4,850 0 0
Willmott & Sons	4,803 0 0
Kearley	4,793 0 0

OATLANDS PARK (WEYBRIDGE).

For house on the Beechwood Estate. Messrs. Crickmay & Sons, architects, 13 Victoria Street, Westminster, S.W.

Annett	£1,875 0 0
Greenfield	1,868 17 4
Hill & Sons	1,745 0 0
Willis	1,686 0 0
Gale	1,650 0 0
Jarvis	1,560 0 0
Lee	1,550 0 0
Gaze & Sons	1,537 0 0
Ranger	1,485 0 0
Drowley & Co.	1,459 0 0
Nicholson, Weybridge (*accepted*)	1,350 0 0

PONTYPOOL.

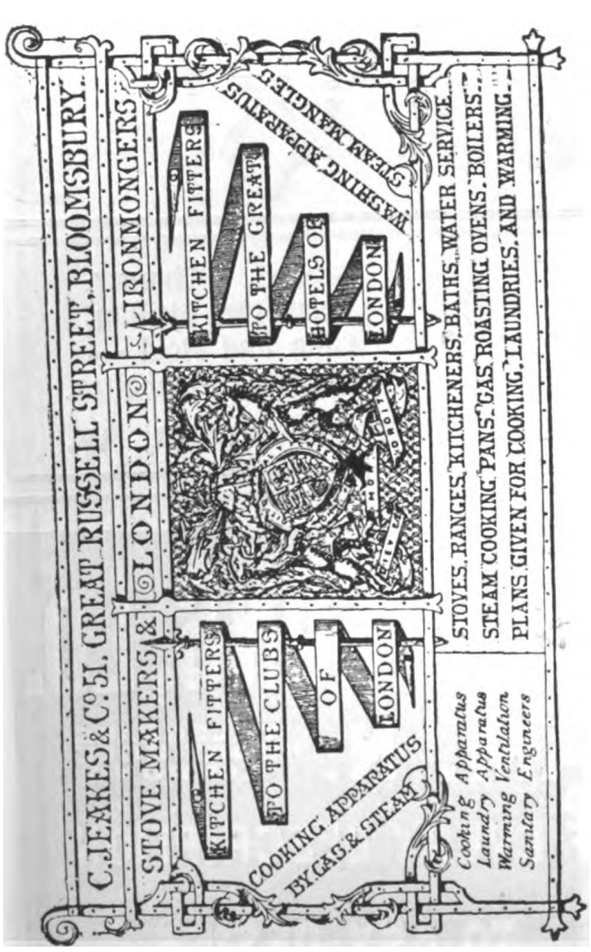
For the erection of three villas at Freeholdland, near Pontypool. Mr. A. Gordon Babbidge, architect, Pontypool.

Saxon	£1,345 10 0
Gregory Bros.	1,221 0 0
Cudby	1,200 0 0
A. & J. Richards	1,128 0 0
W. & A. Davies	1,080 0 0
Sainsbury	1,075 0 0
Meara	1,065 0 0
Branch	1,006 16 0
Powell Bros.	1,002 10 0
Arthur (*accepted*)	989 0 0

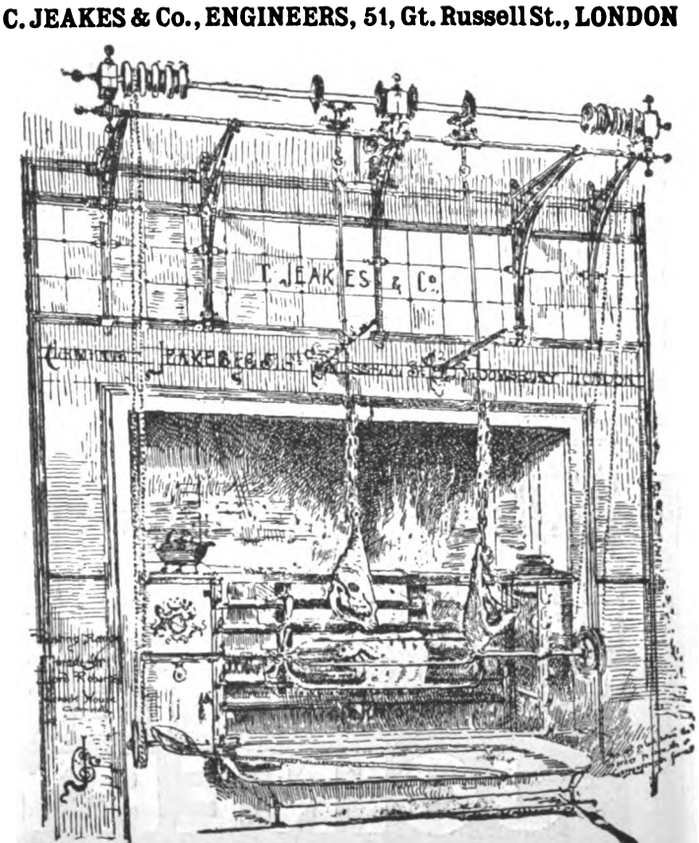
RUDDINGTON, NEAR NOTTINGHAM.

For providing and laying about five miles of cast-iron water mains, with all necessary special castings and valves, together with service connections, &c., in the parish of Ruddington, near Nottingham, for the Basford Rural District Council. Mr. S. Maylan, engineer and surveyor.

Lane	£3,647 10 1
Richmond & Hobster	3,540 0 0
Hawley & Son	3,477 10 3
Nunn & Co.	3,454 1 5
Buckley	3,418 11 9
Palmer	3,414 0 0
Sheepbridge Coal and Iron Co.	3,412 4 0
Price & Co.	3,378 0 7
Bennett	3,368 0 0
Lane Bros.	3,321 10 7
Davis, Ball & Co.	3,317 1 4
Vickers	3,267 15 8
Moss & Sons	3,198 0 0
Mitchell & Sons	3,187 5 4
Staveley Coal and Iron Co.	3,177 11 9
Bower Bros.	3,164 0 0
Smart	3,158 3 7
Blair	3,149 12 7
Ewart	3,135 0 0
Belshaw & Sons	3,122 0 0
Barry	3,075 14 8
Chamberlain	2,994 16 0
Wickstead & Beardsell	2,991 3 1
Nevitt	2,989 17 7
Brebner	2,885 0 9
Hill	2,849 0 0
Langley & Westmoreland	2,788 3 4
Clark	2,734 0 0
Sykes, Scunthorpe (*accepted*)	2,724 0 0
Private connections.	
Sykes (*accepted*)	426 0 0
Case	930 0 0



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SHOOTERS HILL.

For constructing a water-tower, &c., for the Metropolitan Water Board.

Byrom	£3,091 5 8
Mowlem & Co.	2,999 0 0
Wall	2,991 0 0
Munro & Co.	2,930 14 11
Muirhead & Co.	2,736 17 10
Kirk & Randall	2,709 0 0
Lowe & Co.	2,687 0 0
Thomas & Edge	2,630 0 0
Pattinson & Sons	2,576 14 5
Moss & Sons	2,576 0 0
Webster & Son	2,517 11 6
Spencer, Santo & Co., Kensington High Street (*accepted*)	2,287 0 0

SOUTHMOLTON.

For rebuilding of Worlington Bridge.

Berry	£540 0 0
Woolway & Sons	512 10 0
Surveyor's estimate	375 0 0

WALES.

For erection of higher elementary schools, with cookery centre, laundry and caretaker's house, at Stow Hill, Newport, Mon.

Howells	£25,944 12 8
Colborne	20,839 14 9
Davies & Sons	20,805 0 0
Jenkins	19,675 0 0
Reed	19,625 0 0
Blake	19,450 0 0
Moon, Newport (*accepted*)	19,197 0 0
Charles	18,984 0 0

For rebuilding of Coedybrain Farmhouse, Aber Bargoed (Mon.). Mr. H. Caldwell, C.E., Blackwood, Mon.

Williams & Sons	£729 0 0
Davies & Williams	590 10 0
Vodden & Lee	514 0 0

WOLVERHAMPTON.

For the erection of an elementary school at Graiseley, Wolverhampton. Messrs. Fleeming & Son, architects, Wolverhampton.

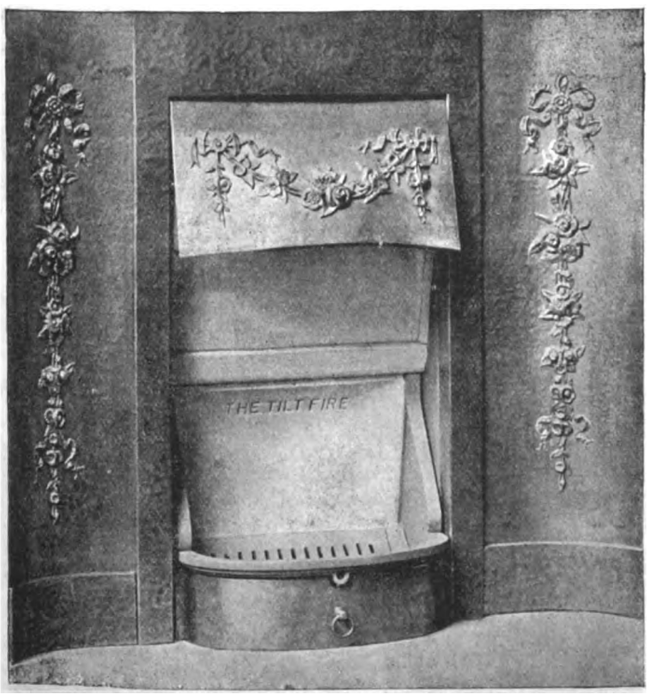
Hammond Bros.	£16,580 0 0
Wistance	14,587 0 0
Boswell	13,622 7 6
Roe	13,327 0 0
Jones	13,300 0 0
Speake & Sons	13,297 0 0
T. & S. Ham	12,900 0 0
Lovatt	12,865 0 0
Gough & Son	12,860 0 0
Cave & Son	12,827 0 0
Willcock & Co., Wolverhampton (*accepted*)	12,750 0 0
Heating.	
Bridges & Son	933 0 0
Killick & Cochran	895 0 0
Dargue, Griffiths & Co.	825 10 0
Brightside & Co.	785 0 0
Lawrence	765 0 0
Beavon & Co.	760 0 0
Ashwell & Nesbitt	755 0 0
Smith & Son	755 0 0
Haden & Co.	751 10 0
Brown	740 0 0
Taylor	700 0 0
Manley & Co., Wolverhampton (*accepted*)	599 0 0
Lighting.	
Manley & Co.	270 0 0
Reed	261 0 0
Hallett	258 15 0
Brown	250 0 0
Gas Company	250 0 0
Ward, Wolverhampton (*accepted*)	219 12 6

For the extensions to the Bingley Street Schools. Messrs. Fleeming & Son, architects, Wolverhampton.

Holder	£4,960 0 0
Wistance	4,498 0 0
Perry	4,429 10 0

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WOLVERHAMPTON—*continued.*

Jones	4,098	0	0
Speake & Son	4,048	0	0
Herbert	4,000	0	0
T. & S. Ham	3,984	0	0
Lovatt	3,925	0	0
Gough & Son	3,875	0	0
Cave & Son	3,837	0	0
Willcock & Co.	3,785	0	0
Tooby, Wolverhampton (*accepted*)	3,753	0	0
Heating.			
Dargue, Griffiths & Co.	665	0	0
Killick & Cochran	635	0	0
Brightside & Co.	576	0	0
Haden	564	0	0
Smith & Son	545	0	0
Lawrence	533	15	0
Taylor	527	0	0
Manley & Co.	485	0	0
Brown, Wolverhampton (*accepted*)	470	0	0
Lighting.			
Manley & Co.	119	0	0
Hallett	115	10	0
Reed	115	0	0
Gas Company	110	0	0
Brown, Wolverhampton (*accepted*)	110	0	0
Ward	109	12	6

WORCESTER.

For secondary school for girls, Victoria Institute, Worcester, for the Corporation. Mr. A. G. Parker, architect, Worcester.

Guest & Sons	£6,950	0	0
Estcourt & Sons	6,936	0	0
Stokes Bros.	6,895	0	0
Sapcote & Sons	6,875	0	0
Broad	6,790	0	0
Bowen & Sons	6,714	0	0
Stephens, Bastow & Co.	6,661	0	0
Wood & Sons, Worcester (*accepted*)	6,437	0	0
J. & A. Brazier	6,400	0	0
Bowers & Co.	6,384	0	0

WORKSOP.

For the construction of an open-air swimming-bath in Prior Well Road, for the Worksop Urban District Council. Mr. G. Rawson, surveyor.

West	£2,061	11	8
Rowsell	1,758	0	0
Messom	1,747	0	0
Bowles Bros.	1,681	9	0
Chadwick, Worksop (*accepted*)	1,550	0	0

WREXHAM.

For alterations to disinfecting chamber, ambulance shed, dining-room and larder at the Joint Fever Hospital, Wrexham, for the Wrexham Rural District Council. Mr. J. Price Evans, engineer, Argyle Chambers, Wrexham.

Jones	£114	10	0
Wooley, Wrexham (*accepted*)	97	10	0

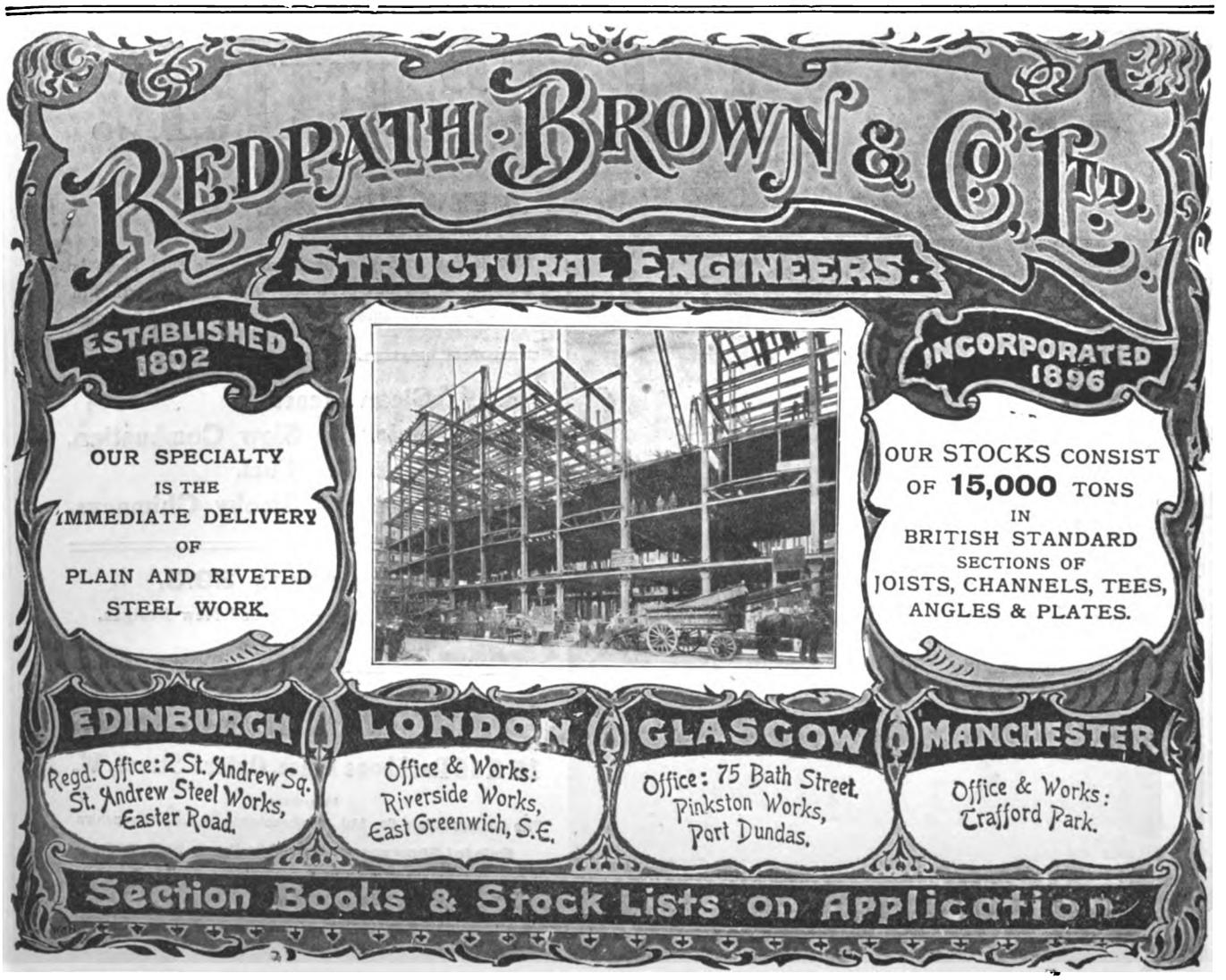
TRADE NOTES.

Messrs. Hill & Smith, the well-known art metal founders, of Brierley Hill, Staffordshire, have registered their business as a limited liability company.

Mr. Frank Stuart Milne, who some time ago left the Newcastle-upon-Tyne Electric Supply Company, Ltd., to take up an important appointment in the Argentine in connection with the Electrical Department of the State Railways, has, in view of the rapid commercial expansion of the Republic, commenced business in Buenos Aires as commercial engineer and agent for British railway mechanical and electrical engineering firms. Associated with him as British Engineer and Secretary is Mr. J. A. Seager, A.M.I.C.E., A.I.E.E., and any firm desiring representation should communicate with the latter gentleman at his office, Emerson Chambers, Newcastle-on-Tyne.

Under the direction of Mr. A. Smith, county surveyor, Boyle's latest patent "air-pump" ventilators have been applied to the new school, Rye Park.

The firms of Lenzberg & Wilson, cornice-pole manufacturers, and Messrs. G. F. Jones & Co., window-blind manufacturers, have been amalgamated, and will be carried on in future at 92 Tabernacle Street, Finsbury, E.C., under the title of Wilson & Jones, Ltd.



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ILLUSTRATIONS.

BOYS' SECONDARY SCHOOL FOR THE BOROUGH OF BROMLEY, KENT.—DETAILS OF PRINCIPAL ENTRANCE.

THE "FILESMITHS' ARMS," SHEFFIELD.

SHOPS AND OFFICES, WAKEFIELD.

REBUILDING OF NETHER SWELL MANOR, GLOUCESTERSHIRE.

VARIETIES.

Mr. E. Douglas Hoyland, architect and surveyor, has removed his offices from 2 Walbrook, E.C., to 10 John Street, Adelphi.

The Woking Urban District Council are going to proceed with the construction of a swimming bath at the recreation ground, at an estimated cost of 450*l*.

The Basingstoke Town Council are going to apply to the Local Government Board for sanction to borrow the sum of 5,200*l*., according to estimate submitted, for the purchase of a field and for laying out 10½ acres. The borough surveyor has been instructed to prepare plans and specifications of necessary buildings accordingly.

The Hampshire County Council have approved the proposal of the education committee to erect at Eastleigh a technical school building and a pupil teachers' centre and manual instruction and science rooms to accommodate 200 pupils, at a cost of 7,550*l*.

The Inspector-General in Bankruptcy in his annual report states that in England and Wales during 1908 the total number for builders was 291, against 308 for the preceding year. Under the heading "Decorators" the total for last year was 102, this number being seventeen less than in 1907.

Mr. William Shearman, of Winchester, builder, who died May 24, left estate of the gross value of 18,444*l*. 12*s*. 10*d*. Probate of his will has been granted to his son, Mr. Sidney Robert Shearman, builder, of 1 Southgate Villas, Winchester, and two others. The testator left 300*l*. and all stock-in-trade, plant, and tools of his business as a builder, and use of yard and buildings in Staple Garden to his son.

The ringing of the bells in the town church steeple, Dundee, is to be performed in future by electricity. At a meeting of the works sub-committee of the Town Council tenders were received for the electric installation, and that of Mr. T. C. Keay, engineer, who offered to do the work for 39*l*. 9*s*. 6*d*., was accepted.

A special conference will be held at Ipswich on September 4 in connection with the annual Trade Unions Congress for the joint purposes of discussing the best means of making effective use of the Housing, Town-Planning, &c., Bill when it becomes law, and of securing an amendment of the Cheap Trains Act.

Messrs. Easton Gibb & Son, the Rosyth Naval Base contractors, have a good record so far as immunity from accidents at their undertakings is concerned, if we except the case of the recent disaster at Newport Dock. In course of last week's inquiry into that accident it was stated that, while insurance companies estimate that a man dies for every 33,000*l*. expended on public works, Messrs. Easton Gibb & Son had lost only one man for 170,000*l*. of work.

The north-east district education sub-committee of the Durham County Council are considering a recommendation to provide an upper standard school to serve New Seaham and Seaham Harbour. The drill field has been suggested as a site which would be central for the whole area. The cost is estimated at 9,057*l*. In addition it is urged that a new school, costing 6,538*l*., should be provided at New Seaham. The sub-committee also propose to build a secondary school at Pelaw.

At a special meeting of Helensburgh Town Council on Tuesday, the 10th inst., Provost Maclachlan presiding, the gasworks committee submitted a report upon the improvement and reconstruction of the carbonising plant and other extensions at the burgh gasworks. After some discussion the Council authorised the committee to prepare specifications and get estimates as to the cost of the proposed improvements and extensions, which it is expected will cost something like 12,000*l*.

At the quarterly meeting of the Morecambe Town Council on Monday, an important improvement scheme was adopted. It was decided to widen the promenade from the Winter Gardens to the West End Pier to a uniform width of 80 feet;

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to build a new sea-wall from a point opposite Highfield to the West End Pier ; to double the tramway track to afford greater facilities for the working of the system ; to erect bandstands and construct underground lavatories, shelters, and flower beds, the whole to cost about 13,000*l*. It was further resolved that the work should be put in hand as early as possible, in order that it may be completed for the opening of next season.

Sir Henry Hibbert, chairman of the Lancashire education committee, distributed last week at Preston the prizes won by students at the plumbing classes in a special series of examinations in practical work conducted at the chief educational centres in Lancashire. Sir Henry said that, so far as he could gather, Lancashire stood alone at present in regard to these practical tests of workmanship. The reason was that the county education committee attached a high degree of importance to successful craftsmanship in plumbing, not only from the hygienic, but from the trade point of view. To a very large extent they had been helped by the Plumbers' Company.

The Burton-on-Trent Town Council have agreed to construct the sewers required on the premises of Samuel Allsopp & Sons, Ltd., and Ind, Coope & Co., Ltd., which are necessary for the separation of the foul water from the clean water, and for connecting the foul water with the Corporation low-level sewer, provided that an agreement could be entered into with the proper parties for the Corporation to carry out efficiently the sewerage referred to on those respective premises. The approximate estimated costs are:—New main sewer at Allsopp's brewery, 1,000*l*. ; separation at Allsopp's brewery, 1,250*l*., and on Ind, Coope & Co.'s, 500*l*., a total of 2,750*l*.

The granite contract for Rosyth is not yet settled. Mr. J. M. Henderson, whose zeal in the interest of Kemnay is unlimited, has received (says the London correspondent of the *Aberdeen Free Press*) a letter from Messrs. Easton Gibb & Co. stating that they were about to give British granite owners an opportunity of offering. Other things being equal, the contract would be given to a home firm. The Norway contract holds good only in the case of the contract going out of the United Kingdom. On the last occasion the quotation received from Sweden was some 20,000*l*. below that of the lowest Scotch tender.

The plans for a new racecourse for Paisley have been approved by the stewards of the Jockey Club. The course is situate at Barnsford Bridge, about two and a half miles north of Paisley Cross and three-quarters of a mile from Houston railway station on the Caledonian line. The plans show a course of one and a quarter miles in circumference. The paddock, stands, &c., adjoin the Greenock Road. The preliminary negotiations are not yet completed, but a start will be made as soon as possible, and it is anticipated that the course will be ready by 1912.

The new schools for the Durham County Council built at Whickham were formally opened on Tuesday. The schools are erected at the top of Whickham Bank, and consist of a mixed department for 400 children and infants' department for 200. The classrooms for fifty each are grouped round a central hall. The building, with playsheds, boundary wall, playgrounds, &c., has been erected at a cost of 9*l*. per head, exclusive of the cookery school, which also forms part of the scheme. The contractor for the whole is Mr. J. A. M. Henderson, of Jarrow. The architects were Messrs. Marshall & Tweedy, 17 Eldon Square, Newcastle.

The Warrington Town Council first considered proposals for the demolition or improvement or the existing Victoria Bridge across the Mersey about twenty years ago. It has now been decided that all firms constructing ferro-concrete bridges are to be invited to send in designs and estimates for a ferro-concrete bridge 80 feet in width. An expert will then be appointed to examine and advise the Council which design to adopt. When these preliminaries have been settled, the Council, it is expected, will at once proceed to build the new bridge.

The Royal Commission on Sewage Disposal held its first meeting on June 21, 1898. There have been ninety-three formal meetings for taking evidence, in addition to a large number of other sittings. Six reports have been issued in several volumes, varying in cost from a few pence to 14*s*. 9*d*. Up to July 31 last the total cost of the Commission was 57,578*l*., including the net cost of stationery and printing, but excluding the cost of accommodation. It is hoped that the final report will be issued in the course of the next eighteen months. In the meantime there may be a further report on standards for sewage effluents.

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The committee of the Japan-British Exhibition to be held at the Great White City, Shepherd's Bush, W., next year, under the auspices of the Imperial Japanese Government, have issued a letter, signed by His Royal Highness Prince Arthur of Connaught, as honorary president, and the Duke of Norfolk, as president, appealing for general support. In the course of the letter it is said:—"The value of the traditional art of Japan and the influence it has exercised on the fine and industrial arts of the world cannot be overestimated, and on the occasion of this Exhibition the nobles of Japan will pour out, from the treasures they have accumulated for centuries, works of art never before seen in this country and only by a favoured few in Japan. The committee joins us in appealing to possessors of the treasures of British art to make a like revelation of those priceless works, many of which are but little known to the general public, so as to equal, and if possible eclipse, the magnificent display of art at the Franco-British Exhibition. The unique character of the Exhibition is sure to attract multitudes of people, not only from Japan and the United Kingdom, and the Colonies and Dependencies, but from every European country and from America, and cannot fail to increase the commerce of the two nations and to create new commercial channels between them and the rest of the world. We therefore trust that the manufacturers and producers of this country, as well as those of the rest of the British Empire, will rise to the occasion by displaying the best of their respective productions in arts and industries, so as to make a representation worthy of this great opportunity."

The official testings of the ferro-concrete bridge at Stakeford over the river Wansbeck were carried out on Monday, under the superintendence of Dr. A. W. Brightmore, Government Inspector. Among those present were Mr. D. Balfour, jun., representing the engineers (Messrs. D. Balfour & Son, of Newcastle); Mr. J. A. Bean, county surveyor; Mr. T. J. Gueritte, of Messrs. Mouchel & Partners, London; Mr. C. W. Brims, of Messrs. Brims & Co., contractors for the work. The length of the structure between abutments is 264 feet, which is divided into six spans of 44 feet each. There is a 20-foot carriageway and a 4-foot footpath. The borings for the foundation showed that rock was found 37 feet from the surface on the south side, 24 feet in the centre of the river, and 20 feet on the north side, with bands of rock nearer the surface. The whole structure is carried by 14×14-inch ferro-concrete piles driven down to the rock by a Lacour steam piling machine with a 1½-ton ram and a drop of 5 feet. In no case has the set of the piles with ten blows exceeded a quarter of an inch. The abutments consist of ferro-concrete carried on a piled foundation properly braced. Each pier has two ferro-concrete cylinders, each enclosing two piles having vertical steel bars embedded in concrete filling and cross-braced together. The main girders rest on piers and carry the cross girders which support the decking of the roadway, on which is laid tar macadam for carriageway and cement concrete for footpath. On each side of the roadway there is an iron handrailing, with pillars at each pier. The bridge was tested first by two 16-ton steam rollers standing side by side in the centre of each of the six spans, when the deflection was found not to exceed one-eighth of an inch on any span. The engines were then run across the bridge at varying speeds, when the above deflection was not exceeded. The maximum deflection allowed by the specification was three-quarters of an inch. The Inspector expressed his entire satisfaction with the result of the testing, and all present were agreeably surprised at the small amount of deflection shown under the severe load and at the absence of vibration when the engines were travelling at varying speeds across the bridge. The official opening of the bridge will take place next month on the completion of the approach roads.

THE BUDGET AND THE AUCTIONEERS' INSTITUTE.

The following important memorial has been forwarded to the Chancellor of the Exchequer by the Auctioneers' Institute of the United Kingdom:—

The Humble Memorial of the Auctioneers' Institute of the United Kingdom, 34 Russell Square, London, W.C.

Sheweth—

1. That your memorialists are the Council of the Auctioneers' Institute of the United Kingdom, which numbers 2,250 members, living and practising in various parts of the United Kingdom, who, by reason of their wide and varied experience in the development, sale, purchase, management and valuation of estates, and their practical dealings with

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land and all interests in land, are enabled to appreciate the probable practical effects of the provisions of the land taxation clauses of the Finance Bill relating to land and interests in land.

2. After careful consideration of the Bill, your memorialists are convinced that many of the provisions therein contained, if enacted and enforced, would operate inequitably, and result in grievous loss and injury to those interested in land either as freeholders, lessees, mortgagees, or trustees; would tend seriously to increase unemployment, particularly in the building and allied trades, and would undoubtedly discourage investment in land or interests in land (including small investments) by depriving property in real estate of the security which has hitherto attached to it, and which is of vital importance.

3. Your memorialists know from their practical experience that the said proposals relating to the taxation of land values, following upon the unprecedented liabilities and restrictions proposed to be placed upon owners by the provisions of the Housing, Town Planning, &c., Bill are viewed in the property market with the gravest apprehension.

4. The insecurity created by the said legislative proposals has already resulted in depreciating the values of freehold and leasehold securities, in the restriction of business, and the withdrawal from the market of many investors, thus effecting the arrest of development and increase of unemployment.

5. Your memorialists have considered the effect of the proposed increment value duty, reversion duty, and duty upon undeveloped land.

A purchaser buys land with all its liabilities and potentialities, and the price paid represents not only the capitalised value of its present productiveness, but also the present capital value of any increase in its income-producing power at any future date. It follows, therefore, that if he be deprived of any portion of that increase by the State (as is now proposed) he is being deprived of that for which he has already paid the full market value.

The proposed reversion value duty is, in the opinion of your memorialists, an encroachment upon a right established both in law and equity, and a violation of existing contracts.

A man buying the freehold interest, subject to a lease, pays the market price not only of the capitalised value of any reserved rental, but also of the capitalised value of the full annual income which the property is expected to yield at the expiration of the subsisting lease. Therefore, to deprive the owner of any portion of that reversionary value is to take from him that for which he has already paid full value.

6. The proposal to tax undeveloped land is also open to serious objection.

In many cases it would in effect penalise the owner of land who would willingly sell, but who could not do so because there would be no immediate demand for land for building purposes.

It is within the knowledge of your memorialists that there are thousands of acres awaiting development, but which cannot be so dealt with immediately because the supply of houses in the respective localities in which such lands are situate already exceeds the demand.

7. The impossibility of calculating with any degree of certainty the amount and incidence of future taxation is a matter of vital importance, and the result must inevitably be not only a depreciation in value of land or interests in land, and consequent loss, but also the total destruction of that element of security which is essential for investment purposes.

8. For the purposes of development of estates and for the provision of houses, it is of first importance that there should always be available an abundance of capital at a low rate of interest. The supply of capital and the rate of interest are governed by the quality of the security offered for ensuring repayment of borrowed capital. Any legislative enactments which impair the security have the effect of raising the rate of interest at which money can be obtained and of restricting the supply of available capital and calling in of mortgages, thus arresting the normal development of land and the provision of dwellings until such time as the demand for houses exceeds the supply, and the consequent enhanced rentals obtainable (owing to scarcity of accommodation) make building enterprise again profitable and therefore practicable.

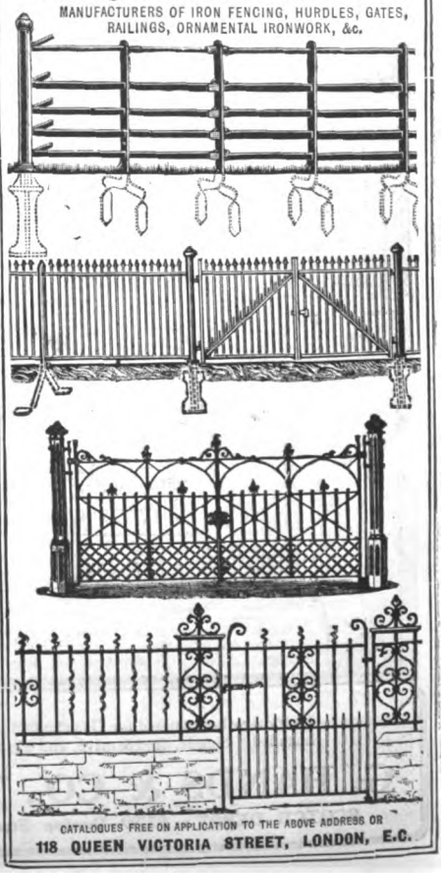
Your memorialists know by actual experience in their business that development has already been arrested as a direct consequence of the proposals contained in the Finance Bill.

9. Your memorialists append hereto a schedule containing examples (based upon recent or current prices), showing to some extent how the taxation proposals will affect values. These examples, however, do not and cannot show fully what

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the effect of the proposals will be, because the insecurity which is being created cannot fail to have far-reaching results. It is probable that investors will not acquire interests in real estate in the future except at prices which will show a much higher rate of interest upon their invested capital than has heretofore been obtained; in fact, the ruling market prices are sufficient indication that such will be the case. Logically, the inevitable result will be—the cessation of building enterprise or an increase in rents.

10. Your memorialists therefore humbly pray that Clauses 1 to 28 (inclusive) of the Finance Bill be withdrawn.

And your memorialists will ever pray, &c.

Given under our seal this 13th day of August, 1909.

The Common Seal of the Auctioneers' Institute of the United Kingdom affixed hereto, in the presence of—

ARTHUR G. WATNEY, President.
ARTHUR GEO. DILLEY. } Members of the Council.
CHARLES HARRIS, Secretary.

THE SCHEDULE

Referred to in Clause 9 of the Memorial.

EXAMPLE 1.—SHOWING EFFECT OF REVERSION DUTY.

In May, 1907, sold at auction, London property comprising freehold ground rents amounting to 39*l.* per annum, with reversion in 1940 to premises of the rateable value of 448*l.* per annum. Price realised 1,810*l.* This sum was 17*l.* more than the auctioneer's estimate, which was as follows:—

For the ground rent till 1940 . .	£763
For the reversion after 1940 . .	1,030
Total value	£1,793

Under Clause 7 of the Finance Bill, as drawn, the reversion duty payable in respect of the "value of the benefit accruing to the lessor by reason of the determination of the lease" would be 766*l.*

Notes.—1. At the time the purchaser bought, he had no reason to think that the Government, by means of the legislature, would deprive him of 766*l.* He was entitled to assume that the Government would not intercept any part of that for which he had paid full value.

2. During the period 1907-40 the income receivable by purchaser (after deducting property-tax) would be only about 37*l.* per annum, representing 2.04 per cent. per annum on capital invested.

3. This investment is depreciated in value now by reason of the proposed taxation, the amount of which might at any time be increased.

EXAMPLE 2.—SHOWING EFFECT OF REVERSION DUTY.

In May, 1907, sold at auction, London property comprising a freehold ground rent of 1*l.* 19*s.* 11*d.* per annum, secured upon trade premises, reversion in 1940 to premises of the rateable value of 241*l.* per annum. Price realised, 600*l.* This was 10*l.* more than the auctioneer's estimate, which was as follows:—

For the ground rent till 1940 . .	£36
For the reversion after 1940 . .	554
	£590

Notes.—1. During the period 1907-40 the income receivable by purchaser (after deducting property tax) is only .316*l.* per cent. (or 6*s.* 4*d.* per cent.) on the invested capital.

2. The reversion duty payable in respect of the "value of the benefit accruing to the lessor by reason of the determination of the lease" would amount to 475*l.*

EXAMPLE 3.—SHOWING ASCERTAINED EFFECT OF PROPOSED TAXATION UPON MARKET VALUES.

In March, 1905, offered by auction and sold freehold ground rents, 150*l.* per annum, with reversion in 1944 to premises of the present assessed annual value of 892*l.*

Price realised in 1905, twenty-seven years' purchase	£4,050
Value in 1909 (on same basis), but having regard to the nearer approach to date of reversion, would be manifestly greater	
Offered by auction in 1909:	
Highest bid	£3,450

Showing ascertained depreciation of at least 600*l.*, or 14.8 per cent. of the price which, but for the Budget proposals, it was reasonable to anticipate.

The effect of the Budget proposals is, therefore, the immediate lowering of the saleable value of reversions, and the consequent deprivation of the owners of that for which many have paid a cash equivalent.

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TESTS ON "CHECK FIRE" DOORS.

A few months ago two doors manufactured by the Check Fire Door Company, Kilburn, N.W., were tested by the British Fire Prevention Committee at their station, and the report has recently been issued. In view of the importance of fire-resisting doors we will briefly give the principal points and the results of the tests. Door A is thus described in the official Red Book:—

On the outer face of the door a sheet of iron $\frac{1}{352}$ in. (.0007 *m.*) thick was placed within the angle iron. Adjoining this the maker stated a sheet of asbestos composition was fixed, and abutting upon this a sheet of corrugated iron, followed by a further sheet of asbestos composition and a sheet of asbestos slate. The inner face of the door was formed by a sheet of perforated iron $\frac{1}{352}$ in. (.002 *m.*) thick. The whole of the above thicknesses were secured to the angle iron frame before mentioned by a cover strip 2 in. by $\frac{1}{4}$ (.051 *m.* by .006 *m.*) rivetted around the angle iron frame; there were also rivets over the surface of the door.

The precise thicknesses and character of the asbestos slate or composition and the precise character and arrangement of the corrugated sheets, &c., were considered by the maker of the door to be of a confidential character.

Across the entire width of the door three strap hinges $1\frac{3}{4}$ in. by $\frac{5}{16}$ in. (.044 *m.* by .008*m.*) were rivetted, one across the centre and the other two 9 in. (.229 *m.*) from the top and bottom of the door respectively.

These were connected by eyes to pivots let into the wall. Fitted into the brick rebate of the jamb was an angle iron outer frame, $2\frac{3}{8}$ in. by $1\frac{5}{8}$ by $\frac{5}{16}$ in. (.066 *m.* by .040 *m.* by .005 *m*), into which the door fitted; this was secured in position by lugs built into the brickwork and pointed in cement. The door was secured by a lock, the bolt of which shot into a staple plate welded on to the frame.

Door B was identical with the above, except that it had no outer frame and the position as to the face exposed was reversed.

The object of the test was to record the effect of a fire of four hours' duration at a temperature rising to 2,000° F., followed by the application of water for five minutes on the fire side.

Twenty-five minutes after the gas was lighted the temperature inside the chamber had risen to 1,180° F., and the top of the door was too hot to allow the hand to rest upon it. In eighty minutes a top corner commenced to buckle inwards, and continued to do so until the end, when it amounted to $1\frac{1}{2}$ inch. Buckling also occurred to a small extent down the sides in the course of the test. After two hours the face of the door had become red hot, yet when paper was laid on the outer face half an hour later it did not scorch. By that time flame appeared over the top of the door, as also happened down one side fifty minutes later. The outside of the door became red hot in places before the test was completed, though the maximum reading of the hanging thermometer in front did not exceed 80° F., while paper attached to a post in front of the lower part did not take fire. The final temperatures after the four hours' test were 2,100° F. inside and 200° F. outside.

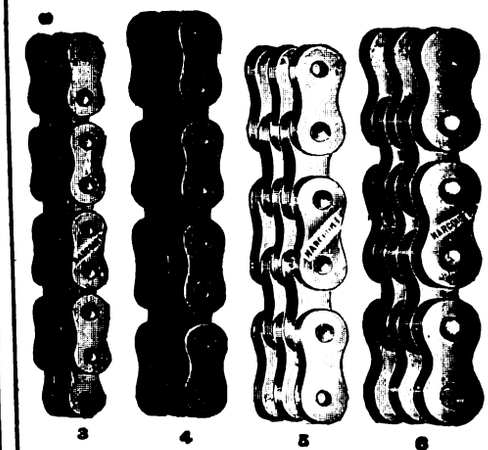
Tests with door B were proceeding simultaneously. In 110 minutes the top corners buckled outwards, the maximum after 215 minutes being $1\frac{1}{2}$ inch. In two hours and a half flame came over this corner. At the conclusion of the test water was applied for five minutes on the inside, with the result that the door contracted to almost its original position and the buckling became invisible. The maximum reading of the hanging thermometer was even less than the other, being 72° F., while as with the other the paper fixed in front did not take fire. The final temperature inside after four hours was 2,080° F. and outside 190° F.

Beulah Spa, on Beulah Hill, Upper Norwood, was a fashionable resort during the first half of the last century, and the Spa House was erected about 1832, under the directions of Decimus Burton, the architect. The existing Beulah Spa Hotel and Hydropathic Establishment indicate the site on the crest of the Norwood Hills, 320 feet above the sea, and but a short distance from the Crystal Palace. It is interesting to record that in 1834 an open-air concert was given in the gardens, when the ill-fated Malibran was prima donna, and a brilliant assembly thronged the lawns to hear her. The gardens, from which there is a view of the country beyond extending to Banstead Downs and even Windsor Castle, appear from contemporary accounts to have resembled a miniature Switzerland, and the old-world grounds, six acres in extent, still retain their charming aspect.

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For Index of Advertisers, see page X.

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THE CITY AND PUBLIC HEALTH.

The report of Mr. Frank Sumner, M.Inst.C.E., city engineer, on the works executed by the Public Health Department of the Corporation of London during 1908 so far as they relate to the engineer's department extends to 60 pages. Several matters of general interest are mentioned, including the following:—

Improvements.

The negotiations with the London County Council as to their contributing towards the cost of widening Bishopsgate Street Without, which were started in 1903, were completed by the receipt in November, 1908, of an intimation that they were prepared to contribute 156,950*l.* towards the widening the street to 70 feet, it being understood that the Corporation will offer no opposition to the construction of a tramway in the portion of the thoroughfare between the City boundary and Middlesex Street. Notices to treat are now being served upon the owners for the acquisition of their interests.

In connection with the widening of Fleet Street, negotiations were entered into with respect to various properties, but they were all deferred, pending a report and estimate dealing with the widening as a whole. This was laid before the committee in July, and in November the Court of Common Council were recommended to complete the improvement forthwith at a cost of 500,000*l.*, subject to the London County Council contributing one-half of the net cost; this was agreed to, and the Council have been written to accordingly, and a conference with them has been suggested.

Claims amounting in the aggregate to about 31,000*l.* have been negotiated during the past year, and were settled for about 14,000*l.* At the end of the year claims to the extent of about 34,000*l.* were under negotiation.

Experimental Pavement.

Permission was given the British Cork Asphalt, Ltd., to lay a specimen of "cork asphalt" in the carriageway of Godliman Street from Knightrider Street to Queen Victoria Street. This portion of the thoroughfare has a gradient of 1 in 22, and is therefore much too steep for asphalt and unsuitable for wood pavement, but the patentees claimed that their material would prove successful even with this gradient. The pavement is composed of bitumen, cork and other materials compressed into blocks, 9 inches by 4½ inches by 2 inches, laid on a 6-inch Portland cement concrete foundation. The experimentors undertake to lay the pavement free of cost and to maintain the same for two years, and in the event of its proving unsatisfactory the Corporation are empowered to take it up and substitute similar material to that which originally existed, or any other pavement, the whole cost to be borne by the applicants. The work was commenced on the 16th and completed on the 30th March, but has not been laid sufficiently long to form an opinion as to its suitability.

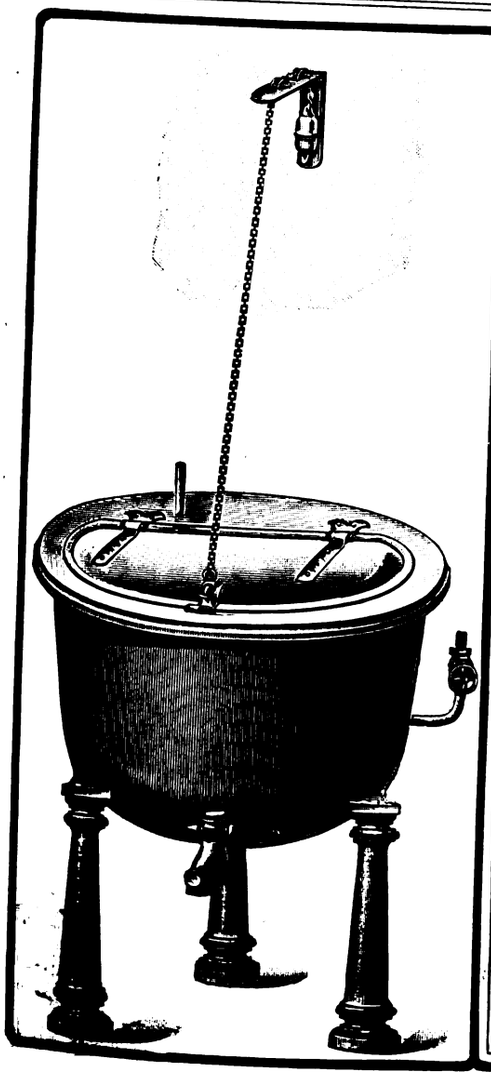
Street Watering.

The quantity of water used during the year for washing and watering streets and courts was 71,582,011 gallons, the number of nights when it was used being 296. From June to September inclusive the gullies were disinfected at least once a week, and in many places a daily disinfection was carried out, while in the streets adjoining Billingsgate Market the gullies are usually disinfected three times a day during the summer months.

In the report last year reference was made to the additional work imposed upon the cleansing department owing to the large quantities of oil deposited upon the pavements from the many motors, particularly omnibuses; this nuisance has during the past year been considerably abated, due to the police authorities taking action against offenders, but although the evil has been reduced, it is stated that there is still room for improvement, either by the introduction of a more effective intercepting tray or improved motive power.

Motor Vans.

The Corporation have at work six motor vans, which are used both in connection with the removal of refuse and the watering of streets. The prices were 750*l.*, 725*l.*, and 600*l.* The expense of maintaining these vehicles is very considerable, due largely to the mechanism continually requiring to be overhauled on account of the strain to which they are subjected by reason of the frequent stoppages and reversing of the gear on account of the enormous traffic and other conditions prevailing in the City streets. Furthermore, the cost of fuel and oils is a considerable item in the accounts, and it is a matter for serious thought as to whether or no the present type of traction is a suitable one for City work.



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Hornchurch Wharf.

With the exception of matter to which a commercial value is attached, all the refuse collected in the City was removed by barges from Letts' Wharf to the Corporation shoot at Hornchurch Marshes. It was decided to invite tenders for the erection of a new wharf 300 feet in length—instead of 400 feet as at present—to be built at the eastern end of the present wharf, and for this alternative plans and estimates were prepared, viz.:—(1) In ferro-concrete; (2) in timber; (3) for a solid wharf wall of masonry or concrete. Tenders were duly received and considered on these lines, and the choice ultimately fell upon a timber structure. The work is now being proceeded with.

Underground Conveniences.

No record is kept of the number of people using the conveniences, but some idea of their utility may be gathered from the fact that 7,351*l.* 13*s.* 7*d.* was received during the year under review for the use of the water-closets and lavatories. The total cost of the upkeep of the structures during the year was 10,714*l.* 4*s.* 11*d.* Plans and specifications were prepared and approved for a new convenience for men, and extensive alterations to the existing convenience in front of the Royal Exchange; also for a new convenience for both sexes at Eastcheap. Tenders were invited, and the work will probably be commenced during the next year.

Demolition of Buildings.

During the year applications were received for permission to erect hoardings for the demolition of buildings at various sites within the City. Owing to casual labour employed on the work, great difficulty is experienced in seeing that the bye-laws are carried out in their entirety, but every effort is being made to enforce them, particularly with regard to the usage of a plentiful supply of water.

Clocks.

Since March, 1903, it has been a condition that all overhead clocks fixed after that date shall be synchronised according to Greenwich mean time. This condition appears to be very necessary, as one cannot help thinking it would be an inestimable boon to the many thousands of persons frequenting the City if the Corporation compelled all owners of clocks overhanging the public way to keep them synchronised. At present it is a rarity to find two unsynchronised clocks alike. Only twenty-eight of the eighty-six private clocks fixed above the public ways of the City, and none of the twenty-nine church clocks are synchronised, but all clocks erected or overhanging the public way have been synchronised since 1903, when the standing order was passed.

Dangerous Structures.

During the year 118 buildings were referred to the dangerous structure surveyor, all of which were certified as dangerous; the usual notices were served, and the necessary steps taken to see that the same were complied with.

Overhead Wires.

Since the year 1899, when the Corporation took in hand the work of supervision, a total of about twenty-five miles of derelict wires have been removed by the inspector of overhead wires. The number of spans of telegraph and telephone wires now crossing public thoroughfares totals about 733,828, compared with 733,200 last year, and 260,000 in 1899. There has been a net increase of about 755¾ miles of National Telephone Company's wires, whilst other companies and private owners have added about twenty-two miles to their lines.

The committee promoting the erection of a church at Barnet Green, Worcestershire, intend to begin at once the erection of a portion of it at a cost of 1,200*l.*

The works sub-committee of the Dundee Town Council were engaged last week in discussing and settling a dispute that arose in the course of the installation of the water supply for the new electric station. The parties at variance were the plumbers and the coppersmiths, and the point at issue had reference to the line of demarcation between the work of the two trades. The plumbers held that all the work concerned fell legitimately within their sphere, while, on the other hand, it was argued that the specifications provided that the copperwork was to be done by coppersmiths. A strike occurred over the matter. After a lengthy discussion it was decided to recommend the Town Council to abide by the terms of the specifications, the brazing and bending to be done by the coppersmiths.

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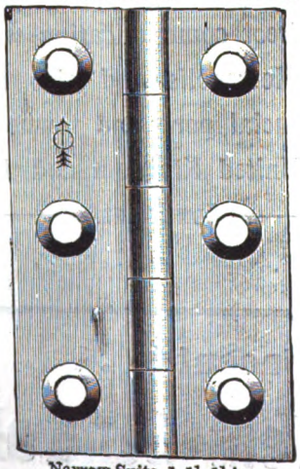
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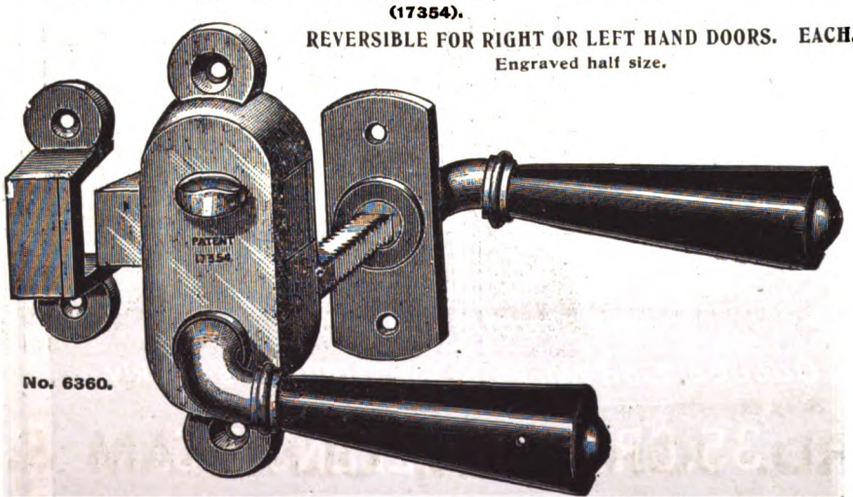
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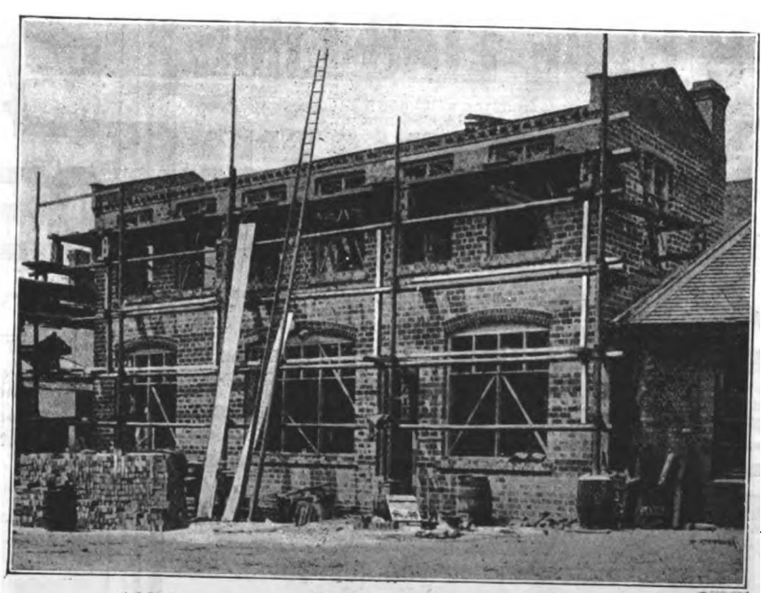
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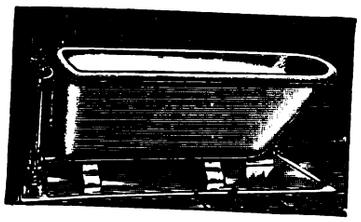
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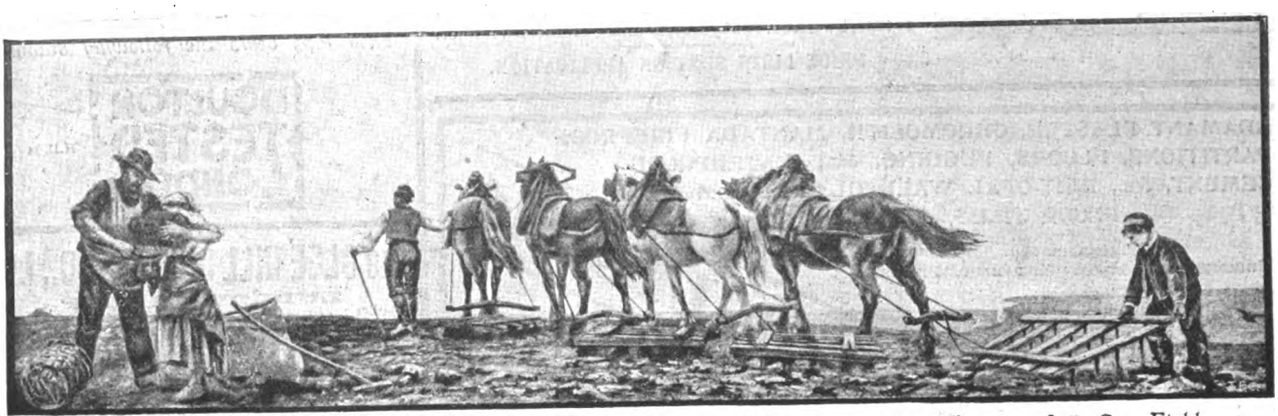
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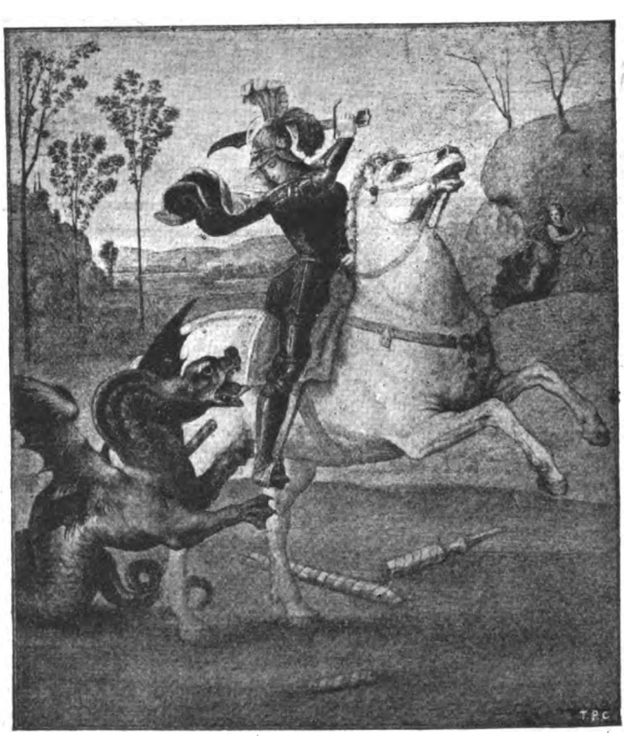
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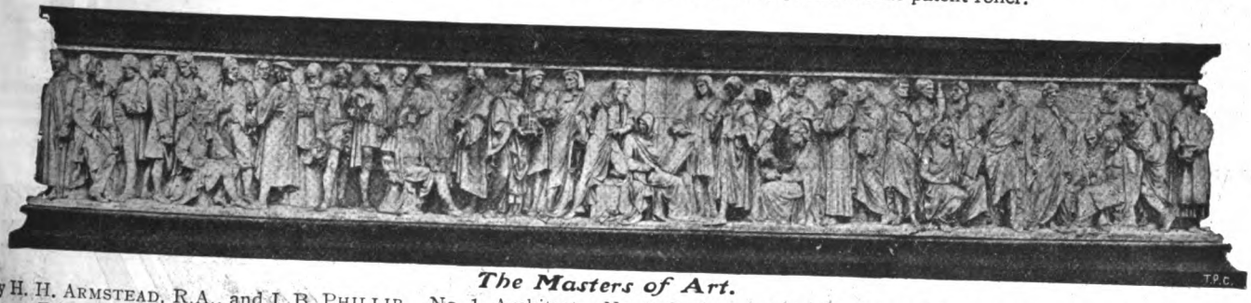
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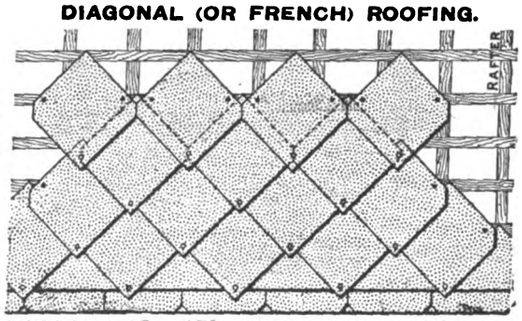
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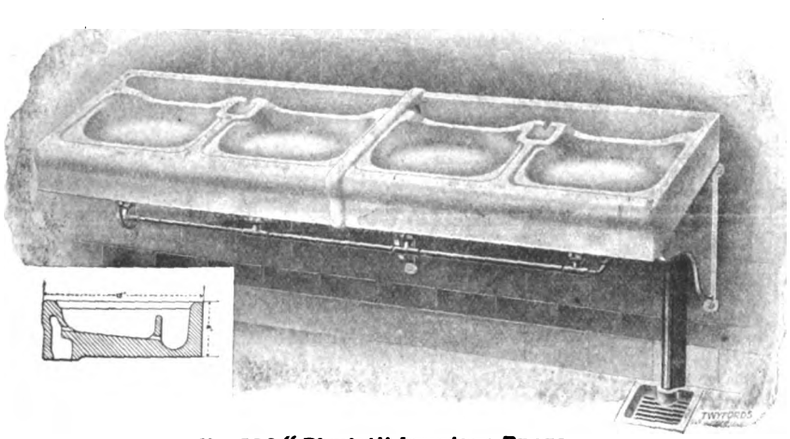


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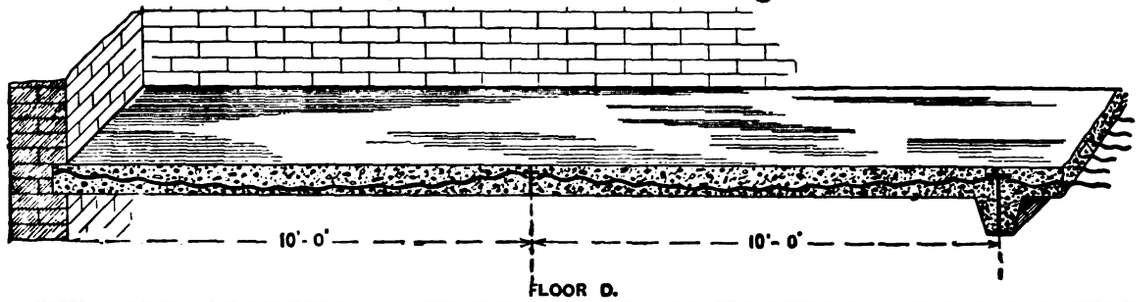
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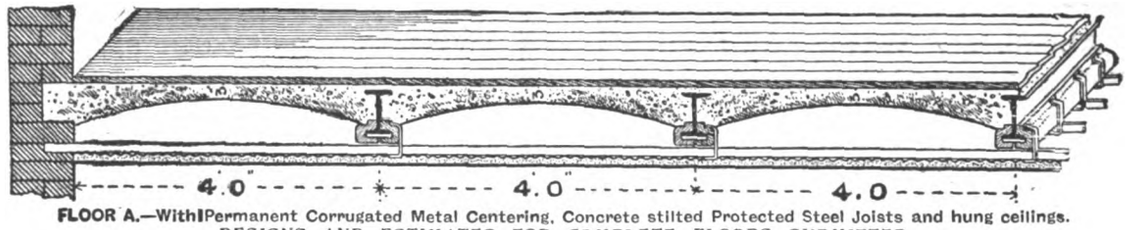
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Architect and Contract Reporter.

FRIDAY, AUG. 27, 1909.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

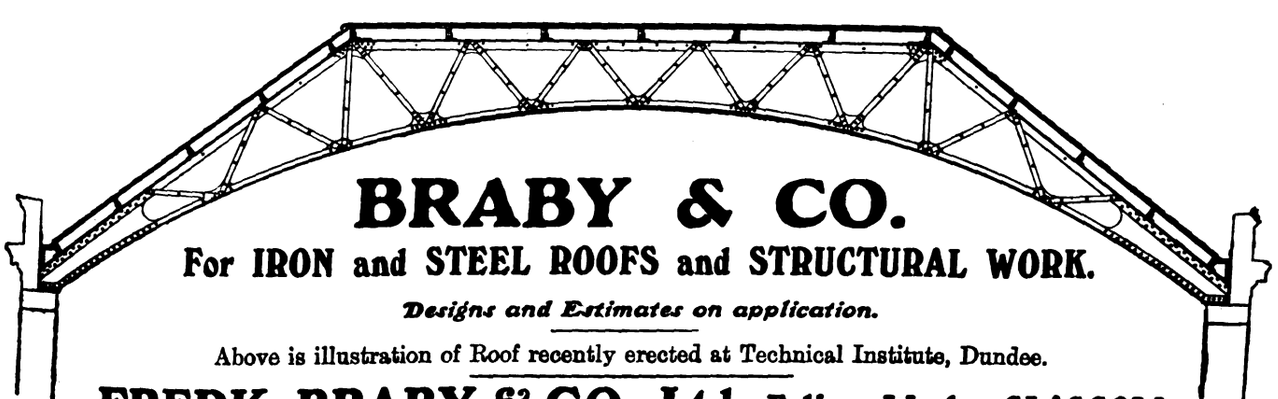
COMPETITIONS OPEN.

DEPTFORD.—Sept. 1.—The Metropolitan Borough Council of Deptford invite designs for a branch library at New Cross, S.E. Premiums of 50 guineas, 25 guineas and 10 guineas will be awarded. Assessor, Mr. J. S. Gibson, V.P.R.I.B.A. Deposit 1*l.* 1*s.* Competition is limited to architects practising in the city or county of London. Mr. Vivian Orchard, Town Clerk, Town Hall, New Cross Road, S.E.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

HULL.—Oct. 11.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

NEWBURN.—Sept. 1.—The Newburn Urban District Council invite designs from architects practising in Newcastle-on-Tyne and Northumberland for new council chamber, offices and caretaker's house. The author of the best design will carry out the work; a premium of 10*l.* will be awarded to the second. Mr. R. J. Leeson (Messrs. Oliver, Leeson & Wood, architects), assessor. Deposit 1*l.* 1*s.* Mr. G. Wilkinson, clerk to the Council, Mosley Street, Newcastle-upon-Tyne.



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Wales.—Oct. 1.—The Urban District Council of Aberdare invite competitive designs for a fever hospital for fifty-two patients, including administrative block, outbuildings, &c. Premiums of 100*l.*, 50*l.* and 25*l.* An assessor will be appointed on the nomination of the President of the R.I.B.A. Deposit 3*l.* 3*s.* Mr. T. Phillips, clerk, Town Hall, Aberdare.

Wales.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

CONTRACTS OPEN.

Alphington, near Exeter.—For the erection of six cottages, residence and business premises. Send names to Mr. J. Archibald Lucas, F.S.I., A.R.I.B.A., Guildhall Chambers, High Street, Exeter.

Adel (Leeds).—Aug. 28.—For any or the whole of the following works required in extension of Lawnswood Cemetery, Adel, Leeds:—(*a*) Excavating and drainage of the grounds; (*b*) formation of macadam roads; and (*c*) erection of lodge. Send names to Mr. W. S. Braithwaite, architect and surveyor, 6 South Parade, Leeds.

Belfast.—Aug. 30.—For erection of offices, Waring Street, for the Clyde Shipping Company, Ltd., Messrs. Watt, Tulloch & Fitzsimons, architects, 77A Victoria Street, Belfast.

Birmingham.—Sept. 13.—For erection of a matron's house at the infirmary, Dudley Road. Mr. W. H. Ward, Paradise Street, Birmingham.

Blackpool.—Sept. 22.—For the erection of central library and art gallery. Deposit 2*l.* 2*s.* Mr. T. Loftos, town clerk, Blackpool.

Bradford.—Aug. 30.—For all trades required in forming bathroom, dressing room and douche baths at the Bowling Back Lane school, for the Corporation. The City Architects, Whitaker Buildings, Brewery Street, Bradford.

Burnley.—Sept. 8.—For the several works in connection with erection of a nurses' home and alterations of the infirmary, Rakehead. Messrs. G. & S. Keighley, architects, Nicholas Street, Burnley.

Cambridge.—Sept. 20.—For erection of additions to the sewage pumping station, Riverside. The Borough Surveyor, Guildhall, Cambridge.

Chesterfield.—For new buildings for the Territorial Force Association. Send name and address to Mr. W. H. Wagstaff, A.M.I.C.E., architect and surveyor, Chesterfield.

Doncaster.—Sept. 11.—For erection of a greenhouse at the Cemetery. The Superintendent, Cemetery, Doncaster.

Dublin.—Aug. 31.—For erection of an additional refuse destructor at the Depot, Stanley Street. Deposit 1*l.* 1*s.* Mr. Fred J. Allan, secretary, cleansing committee, 3 Cork Hill, Dublin.

Dublin.—Sept. 1.—For additions and alterations at the Royal Hibernian Military School, Dublin. Deposit 1*l.* Mr. H. Williams, secretary, Office of Public Works, Dublin.

Epworth.—Sept. 3.—For erection of new schools. The Rev. P. H. Powell, Epworth.

Ilkley.—For erection and completion of cottage, King's Road. Messrs. Garside & Pennington, architects, Pontefract and Castleford.

Ireland.—Aug. 30.—For the erection of a manse at Alliance Avenue, Oldpark. Messrs. Young & Mackenzie, Scottish Provident Buildings, Belfast.

Ireland.—Aug. 31.—For erection and completion of Congregational Church at Ballynahinch, Co. Down. Mr. John Seeds, architect, 1 Donegall Square West, Belfast.

Ireland.—Sept. 3.—For erection of sanatorium buildings of wood and iron at Crooksling, Brittas, Co. Dublin. The Dublin Hospital Board, Municipal Buildings, Cork Hill, Dublin.

Ireland.—Sept. 11.—For the erection of a new Orange Hall, Coleraine. Mr. S. J. M'Fadden, C.E., architect, Queen Street, Coleraine.

Ireland.—Sept. 1.—For rebuilding stores at Chamberlain Street, Londonderry. Mr. J. P. M'Grath, architect, 6 Castle Street, Londonderry.

Leeds.—For the various trades in erection of assembly hall and club premises in Cross Stamford Street. Send names to Mr. Joseph J. Wood, A.R.I.B.A., 10 Park Row, Leeds.



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LONDON.—Sept. 1.—For the construction of isolation rooms at the Eastern Fever Hospital, Homerton, N.E., for the Metropolitan Asylums Board. Messrs. T. W. Aldwinckle & Son, architects, 20 Denman Street, London Bridge, S.E.

LONDON.—Sept. 1.—For constructing a skittle alley and iron shelter at the Northern Convalescent Fever Hospital, Winchmore Hill, N. Deposit 1*l.* Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief, Metropolitan Asylums Board, Embankment, E.C.

LONDON.—Sept. 8.—For certain repairs and painting works at the Union offices, 45 Upper North Street, Poplar, E. Deposit 3*l.* 3*s.* Messrs. J. & W. Clarkson, architects, 136 High Street, Poplar, E.

LONDON.—Sept. 29.—For the erection of a public convenience in Avenue Gardens, Station Road, Wood Green, N. Deposit 1*l.* 1*s.* The Surveyor, Town Hall, Wood Green.

LYDIARD MILLICENT.—Sept. 7.—For erection of a mortuary, disinfecting chamber and laundry at the isolation hospital, Stone Lane, Lydiard Millicent, near Swindon. Mr. R. J. Beswick, M.S.A., 10 Victoria Road, Swindon.

MANCHESTER.—Sept. 1.—For the construction of an underground lavatory for males at the Poultry Market, Shudehill. Deposit 1*l.* 1*s.* The City Surveyor, Town Hall, Manchester.

MANSFIELD.—Sept. 2.—For alterations and additions at Mansfield County Court. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

MARYTAVY.—Aug. 31.—For erection and completion of a small detached house at Marytavy, Tavistock. Mr. Morley B. Collins, architect, Clinton Road, Redruth.

PLYMOUTH.—Aug. 31.—For alterations and repairs at 36 Looe Street. Mr. F. A. Wiblin, architect, 92 Old Town Street, Plymouth.

RAWTENSTALL.—Sept. 1.—For the whole of the works and materials comprised in the construction and erection of public conveniences at Queen's Square. Deposit 1*l.* 1*s.* Mr. James Johnson, C.E., borough surveyor, Municipal Offices, Rawtenstall.

ROYDON.—Aug. 31.—For sundry repairs and renovations at the Roydon Council school, Essex. Separate estimates to be given as follows:—(1) For new closed wooden fence round the playground; (2) drainage and sanitary improvements; (3) repairs and decorating school house; (4) laying on water to school from company's main. Mr. D. Sayle, correspondent, Highbank, Roydon.

ROYSTON.—Sept. 6.—For erection and completion of a County Council school at Royston, Herts (accommodation, 428). Deposit 2*l.* 2*s.* Mr. Urban A. Smith, county surveyor, Hatfield.

SANDBACH.—Aug. 31.—For alterations to Sandbach Heath Church of England schools. Deposit 10*s.* 6*d.* Messrs. Alfred Price & Son, architects and surveyors, Sandbach.

SCOTLAND.—Sept. 8.—For erection of a post-office, Brechin. Deposit 1*l.* 1*s.* H.M. Office of Works, Parliament Square, Edinburgh.

SOUTH ELMSALL.—Aug. 30.—For erection of a brick church, to hold 500, at South Elmsall, Yorks. Rev. Arthur Gould, South Elmsall, Doncaster.

WAKEFIELD.—Sept. 10.—The West Riding education committee invite whole or separate tenders for the following works:—Stanley, Outwood provided school: alterations and asphalting (joiner and asphalter); Bolton-on-Dearne, Goldthorpe provided school: new heating apparatus and heating chamber (builder and heating engineer). Deposit 1*l.* each. The West Riding Architect, County Hall, Wakefield.

WALES.—Sept. 1.—For erection of a caretaker's house in connection with the Public Library, Penarth. Deposit 1*l.* 1*s.* Mr. H. Snell, architect, 13 Hickman Road, Penarth.

WALES.—Sept. 1.—For erection and completion of business premises at Llwynypia. Mr. R. S. Griffiths, M.S.A., architect and surveyor, Tonypandy.

WALES.—Sept. 2.—Separate tenders are invited for decorating and other work at the Wimborne Hotel, Dowlais, and the Queen's Hotel, Blaina. Mr. C. M. Davies, 112 High Street, Merthyr.

WALES.—Sept. 3.—For structural alterations and repairs at the Town Hall, Pembroke. Mr. R. D. Lowless, town clerk, Pembroke.

WALES.—Sept. 6.—For alterations and extensions, including the building of a new school-room and class-room, to the Primitive Methodist Chapel, Pontlottyn. Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

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Wales.—Sept. 7.—For erection and completion of a Welsh Baptist Chapel at Colbren, near Seven Sisters, *via* Neath. Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

Waterfoot.—Sept. 1.—For the works and materials in the erection of a market hall at Waterfoot, Rawtenstall (Lancs). Deposit 2*l.* 2*s.* Mr. James Johnson, C.E., borough surveyor, Municipal Offices, Rawtenstall.

Widnes.—Aug. 30.—For the following, for the Widnes education committee:—(*a*) Removal of the gallery in the boys' department of the St. Bede's R.C. school; (*b*) alterations to the windows of the West Bank Council school. The Education Office, Town Hall, Widnes

Winchester.—Sept. 1.—For erection of the central hall and other works at Peter Symonds's school. Messrs. Cancellor & Hill, architects, 12 Jewry Street, Winchester.

Woolwich.—Sept. 1.—For erection of open-air wards at the infirmary, Plumstead. Deposit 2*l.* 2*s.* Messrs. Church, Quick & Whincop, architects, William Street, Woolwich.

The partnership previously existing between Messrs. Grainger, Kennedy & Little, architects and civil engineers, Melbourne, Australia, has been dissolved. Messrs. Grainger & Little will carry on the late firm's practice at Salisbury Buildings, Melbourne.

The building trade at Bothwell, N.B., is reported to be booming. There is at present in course of erection at Bothwell a large chapel school for the Roman Catholic community of Bothwell and Hamilton Palace Colliery districts. The school is estimated to cost 8,000*l.* There is also in course of erection adjoining the fountain a group of buildings to be known as the Donald Institute, the ground and cost of buildings being gifted to the village by the late James Donald, a native of Bothwell. Owing to the abnormal growth of Bothwell Haugh, "Palace Colliery," the School Board have issued schedules for the erection of a second school, and the work will be proceeded with at once. A petition has also been submitted to the Bothwell School Board to erect a school at Bothwell Park, a large colliery district midway between Bellshill and Uddingston.

TENDERS.

BELVEDERE.

For erecting a porter's lodge at Erith Sanatorium, Little Heath, for the Urban District Council, Erith.

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Pasterfield & English	398 0 0
Shurmur & Sons	396 0 0
Jarvis & Sons	395 0 0
Jones & Andrews	375 0 0
Finnecy	370 0 0
Chandler	367 0 0
Hyde & Co.	359 0 0
Gunning & Sons	358 0 0
Pavitt & Sons	355 0 0
Friday & Ling, Erith (*accepted*)	340 0 0

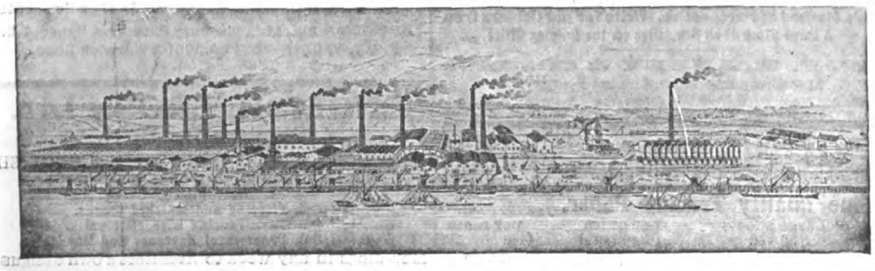
BISHOP'S STORTFORD.

For erection and completion of a high school for girls, for the Hertfordshire County Council. Messrs. Talbot, Brown & Fisher, architects, Wellingborough.

Barker	£7,062 0 0
Lawrence & Son	6,624 0 0
Roberts	6,483 8 7
Parkington & Sons	6,370 0 0
Glasscock & Son	6,360 0 0
Marriott	6,321 14 5
Cracknell	6,265 0 0
Hitch	6,227 7 4
Paul	6,209 8 9
Beardsmore & West	6,096 0 0
Martin	6,017 0 0
Hacksley Bros.	5,969 12 6
Goodman & Murkett	5,964 16 7
Brown & Son	5,890 0 0
Kimberley	5,850 0 0
Henson & Son	5,829 7 6
Day, Bishop's Stortford (*provisionally accepted*)	5,786 0 0

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CULWORTH.

For additions to school. Messrs. Law & Harris, architects, 1 Sheep Street, Northampton.

Bird	£1,425 0 0
Bloxham	1,134 0 0
Gosford	1,063 0 0
Beardsmore & West	1,020 0 0
Watson	999 0 0
Higgs	998 0 0
Heath	997 0 0
Hickman	972 8 0
Hawtin	960 0 0
Martin	942 0 0
G. F. Sharman	936 0 0
Stanton	925 19 0
E. D. Sharman & Son	923 15 0
Green, Northampton (*accepted*)	898 0 0
Chown	860 0 0

DUNDEE.

For erecting central reading rooms, Barrack Street and Ward Road. Mr. Jas. Thomson, city architect.

Accepted tenders.

Symington, mason and brick work	£7,000 0 0
Stewart & Sons, carpenter and joiner	1,354 8 6
Fleming Bros., steel work	652 16 5
Aimer & Sons, fittings	485 14 8
Reoch, plaster work	462 11 11
Maxwells, electric installation	370 0 0
Donald & Smith, glazier	262 1 5
Keay, heating installation	207 18 11
Boath, painter	191 5 5
Farquharson & Son, plumber	175 0 0
Brand, slater	57 14 0

All of Dundee.

GRANGE-OVER-SANDS.

For Cartmel Valley water scheme, for the Urban District Council. Mr. Thos. Huddleston, engineer and surveyor, Council Offices, Grange-over-Sands.

Wright & Co.	£5,373 11 4
Reid Bros.	3,483 0 3
Munn & Co.	3,461 5 4
Robinson	3,339 8 5
Hayes & Sons	3,233 3 6
Mitchell & Son	3,122 10 3
Brebner & Co.	3,106 10 11
Graham & Sons	3,099 0 0
Brigg	3,036 11 0
Worthington's, Ltd.	3,027 18 10
Meikle	2,941 3 10
Keith	2,872 0 10
Vickers	2,833 11 10
Jowett Bros.	2,768 1 6
Starkey	2,739 3 9
Davies, Ball & Co.	2,737 19 10
Etheridge & Clark	2,714 6 7
Bushby & Sons	2,705 19 2
Rigby	2,697 2 5
Blair	2,685 12 8
Wickstead & Beardsell	2,606 1 0
Greenep	2,455 10 1

Labour in trenching and laying and jointing pipes, also carting.

Egan & Sons, Manningham (*accepted*)	491 0 2

Pipes and fittings only.

Wilson's & Union Tube Co.	2,208 10 5
Spencer	2,138 13 2
British Mannesmann Tube Co., London (*accepted*)	1,863 10 1
Stewarts & Lloyds	1,610 0 0
Graham	1,498 11 0
Schultz & Co.	1,375 0 0

Valves, hydrants, &c.

Blakeborough & Sons, Brighouse (*accepted*)	87 13 0

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GRIMSBY.

For shop, warehouse, &c., for Mr. S. Gordon, in Maude Street or Cartergate. Mr. R. A. Robertson, architect, Grimsby.

Smith & Hodson	£1,062 17 0
Emerson Bros.	995 0 0
Carter & Son	990 0 0
Marshall & Son	980 15 0
H. & G. Smith	980 8 6
Parker & Son, Boston and Grimsby (*accepted*)	958 0 0
Edwards & Raynor	912 0 0

HOUGHTON-LE-SPRING.

For the construction of new boundary walls and repairs to existing walls. Mr. J. W. Holbrook, M.I.Mun.E., town surveyor.

Place	£203 2 0
Elrick	163 15 0
Wilkinson	155 0 0
Harrison	145 0 0
Woods & Adams	137 2 3
Brown	134 9 8
Crow	125 19 0
Scarth, Houghton-le-Spring (*accepted*)	116 7 0

KEIGHLEY.

For erection of St. James's Church, Cross Roads, Keighley. Messrs. J. B. Bailey & Son, architects, 3 Scott Street, Keighley.

Accepted tenders.

Waddington Bros., mason.
Taylor, joiner.
Brearley, plasterer.
Thornton, slater.
Binns, plumber.
Turner, painter.
Total, £2,283.

NANTWICH.

For taking down and re-erection of premises in Pillory Street, in connection with the scheme of street widening, for the Urban District Council.

Williams & Sons	£544 0 0
Matthews	470 0 0
Harding	460 0 0
Cox & Vaughan (*accepted*)	449 0 0

NEWARK.

For new high school for girls, Newark, for the Governors of the Lilley and Stone Foundation. Messrs. Brewell & Bailly, FF.R.I.B.A., architects, Nottingham. Quantities by Messrs. C. Pearson Shaw, Son & Hemingway, MM.D.S.H., Nottingham and Bingham.

Brown & Son, Newark (*accepted*) . . £4,445 0 0

PENISTONE.

For the construction and formation of a cattle market.

Accepted tenders.

Eyre, Sheffield, excavating, bricklaying, mason and concrete work	£815 0 0
Tinker & Sons, Thurlstone, carpenter, joiner and ironmonger	96 2 4
Atkinson & Sons, Leeds, founder and smith	95 6 10
F. Tinker, Penistone, plumber and glazier	67 3 7
Beard & Sons, Thurlstone, slater and plasterer	34 15 0
Tinker & Sons, Thurlstone, painting	11 4 1

PERTH.

For erection of stone and brick boundary walls for extension to Wellshill Burial Ground, for the Town Council.

Fraser & Morton	£1,142 2 0
Paton	1,131 0 0
Kerrigan	1,123 18 0
Beveridge	1,121 0 0
McKearney, Perth (*accepted*)	1,103 3 3

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PRESTON (KENT).

For repairs, &c., to the school buildings.

Whiting Bros.	£263 10 0
Dawson	246 10 0
Baker	226 0 0
Ratcliff Bros.	221 2 0
Judges	216 13 0
Fuller & Sons	212 0 0

PUTFORD.

For a mistress's house and other work at the West and East Putford Council school. Mr. Percy Morris, architect, Exeter.

Bennett	£791 0 0
Ridge & Shute	750 15 0
Carter & Morrish, Barnstaple (*accepted*)	608 10 0

TOWCESTER (NORTHANTS).

For alterations and additions at the Towcester infants' school. Mr. J. T. Blackwell, architect, Kettering.

Sturgess & Sons	£670 0 0
Webster	540 0 0
Heath	515 0 0
Green	510 0 0
Haddon & Co.	502 0 0
Holland & Marks	497 15 0
Wheeler	495 0 0
Higgs	490 0 0
Bentley & Co.	477 0 0
Beardsmore & West	459 0 0
Smith & Bunning	429 0 0
Hickman, Market Harborough (*accepted*)	419 19 0

WINDSOR.

For the work in the demolition of the old Theatre Royal. Mr. Harry St. J. L. Percival, architect, 47 Mortimer Street, W.

Wise	£437 10 0
Hollis & Sons	365 0 0
Dovey	350 0 0
Watson	297 0 0
Dunkley	290 0 0

WEMBLEY (MIDDLESEX).

For providing and fixing machinery at the sewage outfall works, for the Urban District Council.

Holland	£215 10 0
Hobbs	176 18 10
Robinson	166 0 0
Spencer & Co.	166 0 0
Haynes, Alperton (*accepted*)	156 14 7
Inglish	181 7 0
Sykes	155 0 0
Graham, Morton & Co.	168 10 0

WOOLFAR-DISWORTHY.

For enlargement, &c., of Woolfar-Disworthy West Council school. Mr. Percy Morris, architect, Exeter.

Bennett	£645 18 6
Ridge & Shute	557 0 0
Carter & Morrish, Barnstaple (*accepted*)	436 10 0

WORKSOP.

For constructing an open-air swimming bath in Prior Well Road. Mr. G. Rawson, surveyor.

West	£2,061 11 8
Rowsell	1,758 0 0
Messom	1,747 0 0
Bowles Bros.	1,681 9 0
Leverton	1,677 0 0
Middleton	1,665 0 0
Chadwick, Worksop (*accepted*)	1,550 0 0

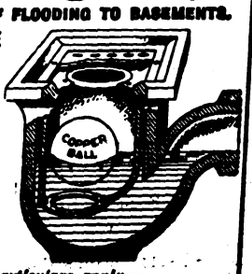
A long discussion took place on Monday last at a meeting of the Sheffield education committee concerning a recommendation that the tender of the Corporation's electric supply department should be accepted for providing and fixing the necessary appliances for lighting the new hostel for men students at Southbourne, Clarkehouse Road, by electricity. Thirteen tenders were received, and that of the department was by no means the lowest. Eventually a tender amounting to 127*l.* was accepted.

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TRADE NOTES.

Messrs. Hobbs, Hart & Co., of Arlington Works, Arlington Street, N., and of Cheapside, inform us that they are supplying the whole of the iron and steel doors that are being extensively introduced into the Mansion House under the direction of the City Surveyor, with a view to fire resistance. A paragraph concerning these improvements appeared in our columns last week.

Among the contracts recently in hand by Messrs. E. H. Shorland & Brother, of Manchester, are the following:—The extensions to the East Ham isolation hospital are being warmed and ventilated by means of their double-fronted patent Manchester stoves with descending smoke flues and special inlet ventilators; the Pear Tree Church, near Southampton, is being ventilated by means of their patent exhaust roof ventilators and special inlet ventilators; the Children's Home for the Lancaster Union is being warmed and ventilated by means of patent Manchester stoves with descending smoke flues; the Chilvers Coton new schools are being ventilated with patent exhaust roof ventilators.

The Directors of the London and Lancashire Fire Insurance Company have appointed Mr. J. S. Proctor as lieutenant to Mr. Bentley, with the title of "local secretary" at the Manchester branch of the Company. Mr. Proctor has for some years occupied the position of local manager of the Aberdeen branch, and his new appointment follows the retirement on pension, owing to ill-health, of Mr. W. Hartley, the Company's local secretary at Manchester. Mr. Archibald F. Rae, hitherto resident secretary at the Dundee office of the Company, has been appointed to the position of local manager of the Aberdeen branch in succession to Mr. Proctor. Mr. Alex. Mackie, at present accident claims assessor, has been appointed to the position of resident secretary of the accident department of the Aberdeen branch, in which capacity he will assist Mr. Rae in the conduct of the accident business. Mr. Frank George Agg, who has until recently acted as the company's resident secretary in Durban, Natal, will fill the position of resident secretary at the Dundee office, rendered vacant by the appointment of Mr. Rae to Aberdeen.

VARIETIES.

Urr School Board, N.B., have approved of plans to extend the accommodation of the public school. The cost will probably be about 1,000*l.*

Pottery works are to be established in Dublin for the manufacture of delph, &c., of which at present about 80,000*l.* to 100,000*l.* is said to be imported every year into Ireland.

The Lochgelly School Board have agreed to feu a piece of ground in High Street, Lochgelly, N.B., from Mr. R. H. Thomson, of Park House, for a proposed school to accommodate 680 pupils.

The Carpenters' Company give notice of their intention of granting two free scholarships in connection with the classes on building construction and constructional drawing to be held at King's College. Particulars may be obtained of Mr. J. Hutton Freeman, Carpenters' Hall, London Wall.

The Royal Colleges of Physicians and Surgeons have disposed of their examination hall on the Victoria Embankment to the Institute of Electrical Engineers. The colleges have acquired a site in Queen's Square, Bloomsbury, Nos. 8 to 11, for a new hall.

Messrs. Somervail & Co., bridge builders, Dalmuir, Clydebank, booked some large orders last week. The Caledonian Railway Company have placed with them an order for nineteen renewal bridges on their system. In addition, they have received from the Clyde Trust an order to erect a large footbridge from Govan Road, Govan, to the docks near to the Allan Line sheds.

The foundation-stone of the new municipal buildings, Bethnal Green, is to be laid on September 23. The new structure is to cost between 30,000*l.* and 35,000*l.* The tender sent in by Messrs. Brand, Pettitt & Co., of Tottenham, amounting to 24,450*l.*, was accepted for the work, which is being carried out under the superintendence of Mr. E. E. Finch, borough engineer and surveyor.

The Liverpool city engineer has been instructed to prepare an estimate of the cost of providing an underground passage between the bottom of Water Street and the locality occupied by the new building of the Royal Liver Society.

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Central Library, Islington. Columns. Henry T. Hare, Esq., F.R.I.B.A.
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Leigh Town Hall. Columns and Pilasters. J. C. Prestwich, Esq.

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ILLUSTRATIONS.

ARCHITECTURAL ASSOCIATION EXCURSION 1909.

MR. W. J. LOMAX, architect, Bolton, has been instructed to prepare working drawings, specifications and quantities for a new library to be erected at Farnworth, Lancs. Mr. Andrew Carnegie, who has approved the preliminary plans, is giving 5,000*l.* to the work.

A MERGER of the cement companies of Canada has at last been completed. The capital is placed at 6,000,000*l.* Sir Sandford Fleming will be the president of the company. It is announced that the bonds will soon be placed on the London market.

ANOTHER extension of building operations is to commence at the Garden Suburb on the estate of Sir A. Paget, Bart., Heath Town, near Wolverhampton. The District Council have approved plans for a further fourteen houses, which, when completed, will form with others already erected a quadrangle with attractive features.

A DEPUTATION consisting of Mr. Carpenter (county surveyor for the West Riding of Yorkshire), Mr. Beaumont (surveyor to the East Riding), Mr. Bradley (surveyor to the Goole Urban District Council), and several members of the Yorkshire County Council, visited Newport on Saturday for the purpose of inspecting the transporter bridge over the Usk.

THE Burnley Town Council have appointed a committee to consider the offer made by Sir John Thursby to sell Bank Hall and the surrounding grounds to the town for 4,000*l.* The estate comprises 31 acres. The owner said that he preferred to offer the property to the Corporation for its future requirements rather than develop it as a building estate. He reserved only the right to the ungotten coal, which, he expects, will be got in about five years' time.

THE plans for the adaption of Seafield House, Seaforth, Liverpool, as an asylum for 345 male patients have now been approved in their preliminary form by the Lunacy Commissioners. The original estimate for altering the buildings was 13,500*l.*; in view of the amendments by the Lunacy Commissioners, the estimate is now 14,500*l.* The committee of the Lancashire Asylums Board, in order to avoid the delay consequent upon an application to the Local Government Board for a loan, recommend that the expenditure and the cost of furnishing, which is not included in the estimate, should be paid out of revenue, spread over three years.

THE British Consul-General at Hamburg referred in his report for 1907 to the formation of a company at Hamburg for utilising the tides at Cuxhaven for the purpose of producing electricity for making ice, liquid air, &c. During the past year, Sir W. Ward now states, the project does not seem to have advanced beyond this initiatory stage, but a meeting of the shareholders of the company was held recently at which it was announced that the construction of the works required for commencing operations will now take place. The managing engineer expressed at this meeting full confidence in the successful working of the undertaking, though some persons were of opinion that the costs would be too great to render it profitable.

IN the House of Commons last week the Prime Minister was asked if his attention had been called to the statement by the directors of the Piccadilly Hotel, Ltd., now in liquidation, that alterations in the designs of the building were insisted on by the representatives of the Crown, as landlord, which entailed an expenditure of about 160,000*l.*, and a further large loss owing to the diminished rental of shops sub-let in the building; and whether it was proposed to continue this system. Mr. Hobhouse replied as follows:—"I have seen the statement referred to, but there must, I think, be some mistake in it, as I am advised that the Crown requirements, which were in the main settled by the previous Government, could not in themselves have entailed the extra cost or loss in rental alleged. It is clearly desirable that, in the case of large rebuilding schemes on Crown property, due regard should be paid to architectural result, and I am not prepared to say that a slight additional expense is not sometimes justified for this purpose. At the same time, I can assure the hon. member that care is taken that commercial considerations are not overlooked; indeed, I am at the present moment considering the best method of securing these two objects in another important rebuilding scheme."

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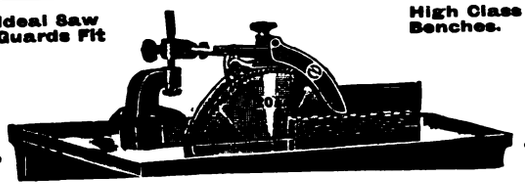
Captain Morrison-Bell recently asked the President of the Local Government Board if he could state the number of houses and tenements now unoccupied in each of the Metropolitan boroughs, and in Birmingham, Bristol, Leeds, Liverpool, Manchester, Portsmouth, Sheffield, and Glasgow. Mr. John Burns, in a printed answer in the Parliamentary papers, furnishes an interesting table. He points out that in some cases the figures are approximate only, and usually houses and tenements in respect of which the payment of rates is compounded for are not included, as information with regard to them is not available. The following are the figures:—Battersea, 2,064; Bermondsey, 426; Bethnal Green, 1,054; Camberwell, 3,911; Chelsea, 652; Deptford, 1,090; Finsbury, 1,650; Fulham, 1,047; Greenwich, 1,212; Hackney, 2,017; Hammersmith, 1,213; Hampstead, 956; Holborn, 789; Islington, 2,554; Kensington, 1,989; Lambeth, 3,500; Lewisham, 3,732; Paddington, 2,000; Poplar, 1,321; St. Marylebone, 1,324; St. Pancras, 1,157; Shoreditch, 1,296; Stepney, 2,684; Stoke Newington, 449; Westminster, 2,175; Woolwich, 1,276; Birmingham, 8,461; Bristol, 4,850; Leeds, 6,875; Liverpool, 6,900; Manchester, 9,928; Portsmouth, 1,652; Sheffield, 4,907; and Glasgow, 17,000. In the cases of the Metropolitan boroughs of Southwark and Wandsworth no information is available.

The principal lining granted at Glasgow Dean of Guild Court last week was for buildings in connection with the reconstruction of the Glasgow Royal Infirmary. The plans passed are for a portion in Castle Street, the estimated cost of which will be about 89,000*l*. Another important lining was for the erection of a Roman Catholic church and presbytery in Dixon Avenue and Belleisle Street, Govanhill, at a cost of 15,000*l*., for Archbishop Maguire and others. Several other plans were also passed on the 19th inst. The plans in connection with the Royal Infirmary above mentioned are for the second instalment of the main building, now in course of erection. The portion already erected comprises about two-thirds of the surgical block, the remaining third being embraced in the portion now about to be proceeded with. In addition to this it comprises the central block, which contains the administrative department and department for special diseases. The central block is cut off from the blocks on either side of it by large archways, which form a conspicuous feature in the quadrangle front. The main entrance is in the centre of the special diseases block, and leads to a large entrance hall which has a gallery at every floor, the circular well running to the top of the building. This hall is lighted on three sides and also from the roof. Mr. James Miller, A.R.S.A., 15 Blythswood Square, Glasgow, is the architect for the building.

The contract for the erection of County Council offices at Winchester (Mr. W. J. Taylor, county surveyor) has been awarded to Messrs. W. Moss & Sons, Ltd., of Loughborough, for 13,436*l*., while the contract for constructing about 2,000 square yards of concrete floors has been given to the Yorkshire Hennebique Contracting Company. The estimated cost of the buildings was 18,000*l*., and furnishing 2,000*l*. The accepted tender was considerably less than the estimate, and at the Local Government Board inquiry the application for the loan was reduced by 1,500*l*. The Local Government Board had now given their sanction to a loan of 16,500*l*. on the buildings, and deferred the application so far as it related to furnishing. The period for repayment was thirty years.

The Rev. Canon A. S. Valpy, M.A., of the Close, Winchester, who left estate of the gross value of 216,000*l*., bequeathed 1,000*l*. to the Dean and Chapter of Winchester for the improvement or decoration of some part of the cathedral (less any sums expended by the testator upon the chapel in the north transept). 10,000*l*. to the Dean and Chapter of Winchester upon trust for a permanent capital endowment of which the income shall be applied for repairs or ornamentation of the fabric of Winchester Cathedral. 10,000*l*. to the Bishop of Winchester for the time being for building a church in that diocese, preference being given to the parishes of Aldershot and Farnborough. But by codicil, dated June 14 last, he stated:—"I fear that owing to the new Budget arrangements the legacy to the Bishop of Winchester, re the new Aldershot church or parish, will not be able to be paid. I, therefore, cancel that legacy, but I desire my executors, when the time for payment shall arrive, to pay such portion of it as they think they can do in fairness to other legacies."

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THE PRACTICAL STERILISATION OF WATER AND OF SEWAGE EFFLUENTS.*

In the following paper it will be the author's object to deal with the practical sterilisation of sewage effluents and of water, as distinguished from the theoretical side of the question, which has been treated at great length by chemists and bacteriologists. It is for the chemist and bacteriologist to tell us of the need for sterilisation, of the best sterilising agents, and of the quantity and strength of sterilising agent required in each case; but it is for the engineer to find out how best to make the sterilising agent, and how best to apply it. It is his duty to make the process of sterilisation as effective, as simple, and as economical as possible. The chemist's training does not qualify him to deal with the details of the design, the construction and working of machinery, and seeing that his knowledge does not extend, in short, to the carrying out of engineering works, it is clear that such works cannot be carried out to the best advantage without the co-operation of both the engineer and the scientist. This fact has so often been overlooked in the past in sewage purification experiments that the author feels it needs emphasising in the present paper.

It may safely be said that the differences of opinion which exist between scientists are generally due to no fault in theory, but to considerable fault in the practical application of the theory.

As a practical illustration, one may imagine that at some remote period a great scientist discovered that a pint pot would contain a pint of liquid, but that his theoretical observations were not borne out in practice, owing to the fact that the pint pot in question was of such faulty construction that it allowed a large proportion of its contents to escape unobserved, for which cause other scientists came to the conclusion that the pint pot in question held a quart.

Evidence for and against Sterilisation.

It is not to be denied that hitherto most people in this country have regarded the idea of sterilisation of water or of sewage effluents with disfavour, and that eminent authorities

* A paper read at the Building Trades Exhibition by H. C. H. Shenton, M.S.E.

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have declared it to be practically impossible. This feeling of prejudice is the more remarkable when one considers that the sterilisation of sewage effluents is practised in America and has been recommended by the Board of Agriculture of that country, while the sterilisation of water supplies has been adopted on an extensive scale at many places on the Continent and in America. Moreover, during the typhoid epidemic at Lincoln in 1905 the water supply of that city was actually sterilised with hypochlorite of sodium with most satisfactory results, and it is not to be doubted that many lives were thereby saved. The water being hopelessly polluted at the time, and no other supply being available, it is absolutely certain that nothing short of sterilisation could have rendered the water fit for consumption. A still more remarkable fact is that while the chemist and bacteriologist have done their best to prove the absolutely unsatisfactory condition of some of our most important sources of water supply, and have even gone so far as to state that no untreated water can be considered absolutely above suspicion from a bacteriological standpoint, and though they have pointed out that nothing short of sterilisation of sewage can protect the oyster-beds and fisheries round our coasts, they have with one or two exceptions condemned sterilisation in a whole-hearted manner. Thus, in Appendix VII. of the Fifth Report of the Royal Commission on Sewage Disposal, the opinions of the experts are all more or less to the effect that the sterilisation of sewage effluents is impracticable, and although these opinions were given as long ago as the year 1903, the Royal Commissioners appear to have based their opinions upon them. Dr. George Reid, in a paper read before the Royal Sanitary Institute at Stafford in the year 1907, condemned in a very decided manner sterilisation proposals set forward by Mr. W. Pollard Digby and the author, in a paper read before the Society of Engineers in 1906, which proposals were to the effect that sewage effluents discharged into tidal estuaries near shell-fish layings and into rivers like the Thames and the Lea, from which large supplies of drinking water must inevitably be drawn, should be sterilised, and that this could be done most economically by the use of electrolytic hypochlorite of sodium, and that the cost of this extra treatment ought not to come on the local authorities, but upon the authorities who draw their water supply from the river. These proposals, Dr. Reid stated, were condemned on general principles. He said "the question of sterilising sewage effluents has been the subject of more or less shadowy talk among public health experts for some time past; it is somewhat remarkable, seeing that the need for such a proceeding can only be justified on medical grounds, that the proposal is being pushed forward by engineering experts, while those medical experts, or the majority of them, who, up to the present, have publicly expressed their views, contend that the suggestion is impracticable." Dr. Reid is quite correct in stating that the opinion of the medical experts has, generally speaking, been to the effect that sterilisation of sewage effluents is impracticable. Professor Bostock Hill, for instance, at the same meeting, said that "instead of endeavouring to raise false standards of purity by going to the expense of sterilisation when the principle was wholly wrong, it was their duty to remove from the list of possible watersheds all those streams which received a large quantity of sewage." Thus, such rivers as the Thames, the Lea, and many others which form the only possible sources of water supply in many important cases, must be removed from the list of possible watersheds. This is, of course, a *reductio ad absurdum*, and merely serves to show the absolutely theoretical manner in which the scientist sometimes looks at these matters. The waterworks engineer and the municipal engineer know, however, only too well that even while such statements are being made, they must supply water of safe quality somehow, and do it immediately, or suffer the consequences. Dr. Reid, in his reply to the discussion on his paper already mentioned, said "the question was asked whether London should continue to drink sewage until some other supply was obtained; well, he was afraid it must, there was no other alternative."

It is interesting to compare the above very decided statements with those made by the U.S. Department of Agriculture, in Bulletin No. 115 of the Bureau of Plant Industry, which are as follows:—"Where sewage is rendering a water supply exceedingly dangerous, however, either the water must be disinfected before being distributed to the customers, or, according to what is the more logical first step in economic and æsthetic purification of the water, the polluting

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sewage must be purified, and at least partially disinfected, before it is discharged into the stream or lake in question."

Again, the same report states that "It is desirable in many instances to remove from the sewage effluent bacteria which might be considered members of the pathogenic group. This is especially necessary when sewage is discharged in the vicinity of shell-fish beds, or when towns and cities are so intimately related that the standard methods of water purification cannot sufficiently protect one community from the sewage of another." This statement is followed by a description of certain sterilising agents, with costs of treatment from extensive experiments on a large scale which will be referred to later.

Messrs. Phelps and Carpenter, at the Massachusetts Institute of Technology, discussed the sterilisation of sewage effluents fully, and the paper was republished in the English *Sanitary Record*, January-March, 1907. Their conclusions were as follows:—"Ordinarily it is not the function of the sewage filter to remove bacteria from the sewage. In the case of the modern rapid filters we are not at all certain as to the fate of the dangerous germs of disease.

"Where extensive shell-fish interests are at stake, it will sooner or later become necessary to protect the neighbouring waters from pollution, and in this case the total absence of pathogenic bacteria must be assured. This result may be attained by the ultimate use of sand filters or by chemical sterilisation.

"Among the possible agents for use in sterilisation, chlorine, either as chloride of lime or as free gaseous chlorine, appears to have the highest cost efficiency. An amount of the former which will yield five parts per 1,000,000 of available chlorine was found to have destroyed 99.96 per cent. of the total bacteria, and practically all of the bacillus coli present in the effluent of a trickling filter treating crude Boston sewage, the time of contact having been two hours.

"The estimated cost of such treatment is $1.05 per 1,000,000 gallons of sewage." Messrs. Phelps and Carpenter add:—"The use of gaseous chlorine, manufactured at the disposal works by electrolytic methods, would, in the case of larger works, considerably reduce this cost. An approximate estimate places the cost of such treatment at about 85 cents per 1,000,000 gallons of sewage, allowing five parts of chlorine per 1,000,000. It is probable that the chlorine in this form is somewhat more efficient.

"The process, as thus outlined, is entirely feasible, and in the case of large works it is cheaper than sand filtration."

It is interesting to note that with regard to the efficiency of electrolytic hypochlorite, as compared with chloride of lime, Mr. Bertram Blount, in "Practical Electro-Chemistry," states that "one molecule of sodium hypochlorite (NaOCl) is equivalent in oxidising power to two atoms of chlorine" (pp. 26-27). This statement absolutely supports Messrs. Phelps and Carpenter's conclusions.

Sterilisation of Storm Water.

Of the objections raised to the sterilisation of sewage effluents, the only one of serious practical importance is that which relates to storm water. It has been urged that in times of storm a large quantity of sewage must necessarily pass into the rivers untreated from storm overflows—not only from overflows which take place at the sewage disposal works, but at overflows taking place from the sewers direct. Against this objection it must be first clearly understood that, even assuming that storm water must overflow from the sewers direct, there is no great difficulty in adding the sterilising agent to the liquid as it leaves the overflow. The sterilising agent has in any case to be added in very small quantities, and can be stored in a tank or in tanks, and discharged into the overflowing liquid by means of an automatic valve, which will add as much of the sterilising agent as is required to the volume of the flow This is an extreme case, and as a rule such overflows can be done away with, and the Fifth Report of the Royal Commission on Sewage Disposal distinctly advises the avoidance of overflows on branch sewers wherever possible. Where the storm water all runs to the disposal works, there is no great difficulty in treating the whole of it in the same manner as the ordinary effluent. This was actually done at Maidenhead over an extended period. It is quite as easy to add a small dose as a large dose, and as the Royal Commissioners have advised the use of tanks wherein the storm water may be stored for treatment, the difficulty vanishes altogether. There may remain the impression that an immense quantity of sterilis-

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ing agent would be required in order to deal with a large volume of storm water, but it must be remembered that, although the rate of flow may, at times, be enormous, such rushes are not of long duration, and that taken over the whole year, the volume of storm water as compared with the volume of sewage is, after all, not very great. The Royal Commission report gives the following instances of the increase in the total volume of the sewage due to storm water:—

	Per cent.
Hampton, separate system, increase due to rain	10
Horfield, partially separate system ,, ,,	64
Little Drayton, combined system ,, ,,	30
Rhyl ,, ,, ,, ,,	32.5
Deal ,, ,, ,, ,,	20.35
Rochdale ,, ,, ,, ,,	52
Oswestry ,, ,, ,, ,,	21
Chorley ,, ,, ,, ,,	45
Croydon, partially separate system ,, ,,	11.6

Pollution of Rivers above Waterworks Intakes.

In order to prove the impracticability of the proposals made in the Digby-Shenton paper, Dr. Reid assumed that a town of 10,000 inhabitants obtained its supply from a stream which, higher up, received the effluent from the sewage works of a city with a population of 50,000. This is exactly the reverse of the case in which sterilisation would be required. The cases where the sterilisation of sewage effluent is essential will be similar to the following instance observed by the author recently. A certain river forms the only possible supply of a large district served by a water company. The water has recently been found to be unsatisfactory in quality, but wells sunk at great expense have not yielded a supply sufficient to enable the water company to dispense with the river supply. The author observed a large sanatorium for consumptive patients on the banks of this river above the intakes, but within sight of the river's mouth. There were here and there other similar sources of pollution along its course. What doubt can exist that in this case the effluent passing to the river from the sanatorium ought to be sterilised? Many people would say it ought never to be permitted to go into the river at all, but it would be absolutely impossible to prevent the sewage from eventually finding its way into the natural drainage channel of the district, and it would be quite impossible to supply the district with water from any other source at the present time. The fact that this stream is polluted with drainage off the land and by many other smaller things is of small consequence beside the horrible pollution taking place from the sources already mentioned. In such cases, assuming that the scientists are correct, the only safe course to adopt must be to sterilise all sewage effluent entering the river, and also to sterilise the water drawn out of the river for drinking purposes. The same principle applies in larger cases. We have a city with a population of 6,000,000, which draws a large proportion of its water supply from the Thames, upon the banks of which is a population of, say, from 20,000 to 40,000 inhabitants. It is obvious that it would be a very small matter for the Metropolitan Water Board to see to it that no dangerous pollution of the river likely to cause disease in London should take place. On the river Lea the Water Board actually do sterilise the sewage of Hertford with chemical hypochlorite.

Where a new sewerage system is constructed, the volume of storm water can generally be reduced within reasonable limits. Where enormous quantities of clean water enter the sewers a proportion of the flow is generally due to subsoil water entering the system and to surface water being admitted, which might easily be taken to natural drainage channels for the district.

Sewage Discharged near Fisheries.

The need for the sterilisation of water and of se..... effluents entering the sources of water supply has been dealt with, but there remains the important case of sewage discharged in the vicinity of oyster-beds and fisheries.

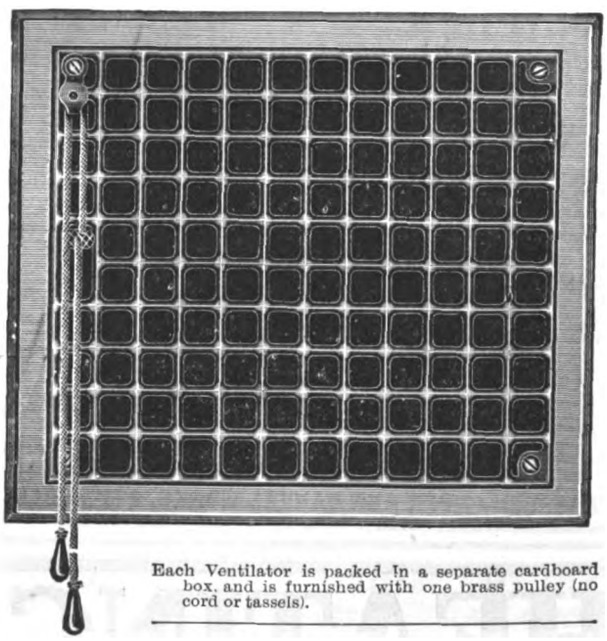
It is needless to re-state the enormous amount of evidence which is at hand to prove that such contamination does take place with most serious results to the public health. The Royal Commission reports alone show that this is so, and the Royal Commissioners state that the only remedy is the removal of the oyster-beds or the removal of the sewage. They do not suggest any other remedy; but it is quite clear that the remedy suggested, if one can call it such, is quite impracticable. We have, in this country, a shell-fish industry, estimated by Captain Anderson, chairman of the Whitstable

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Company, to have a capital value of from 6,000,000*l.* to 8,000,000*l.* We have, on the other hand, a growing population round our coasts which must tend more and more to the pollution of the water in which the oysters exist. It is impossible to remove the population, and it is impossible to remove the shell-fish beds without destroying a valuable industry. On the other hand, it is quite clear that where a local authority does pollute oyster-beds or fisheries, they are liable to very serious penalties. Legal decisions in the cases of *Foster* v. *Warblington Urban District Council*, *Hobart* v. *Southend-on-Sea Corporation*, and *Owen* v. *the Faversham Corporation* have made this quite clear. The policy of shutting one's eyes to existing evils, however unpleasant, and living in a fool's paradise, cannot surely be the right way out of this difficulty. The author has no wish to contend that sterilisation is necessary at any particular place, but he does contend that unless the medical and scientific experts have raised an altogether unnecessary scare with regard to the pollution of drinking water, and to the pollution of oyster-beds and shell-fisheries, sterilisation must be required under given conditions, and that it is the only possible way out of the difficulty, always assuming that the difficulty exists.

Methods of Sterilisation.

Various methods have at different times been proposed for sterilisation. Heat, lime, acids, ozone, copper and its compounds, chlorine and its compounds, &c., have been proposed as agents, but at the present time there is a general agreement of opinion that chlorine is the most economical sterilising agent for sewage, while for the sterilisation of water ozone has been used at the majority of places. For sewage treatment chemically prepared hypochlorite in the form of bleaching powder or of chloride of lime has been largely used in America, while experiments have been made at Guildford, Maidenhead and elsewhere with hypochlorite of sodium prepared by electrolytic methods, which agent is now in common use as a disinfectant for various purposes.

For the sterilisation of water Dr. Rideal, in his paper read before the Royal Sanitary Institute on January 13 of the present year, pointed out that ozone is the ideal agent, since it leaves behind it only oxygen and nothing foreign to the water; but in the author's opinion there is much to be said in favour of hypochlorite of sodium, and especially for that produced by electrolytic methods. This agent is much cheaper, and unless the amount of organic matter present in the water is very large, it will have no unpleasant effect upon the liquid. It is difficult to see how ozone purification can compete with sterilisation by means of hypochlorite in the case of sewage effluents, but the ozone plant manufacturers are undertaking to do such work, and in view of further developments it is quite possible that both systems will be used.

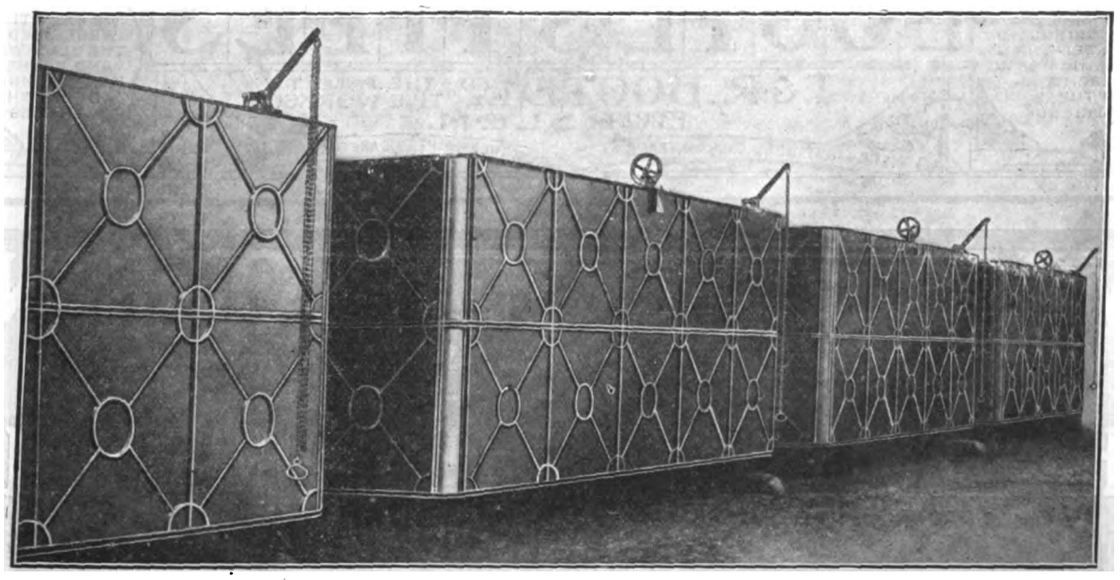
Ozone Sterilisation.

In the paper read before the Royal Sanitary Institute upon the purification of water by ozone, by Dr. Rideal, attention was drawn to the fact that the Paris authorities are sterilising, or have decided to sterilise, a large proportion of their water supply. From this paper and from the discussion which followed it, it seems that about 20,000,000 gallons of water per diem are now to be sterilised by the ozone processes, as the result of experiments which have been carried on for a considerable period. This decision by the Paris authorities in favour of ozone is of great importance.

There are many patents which affect the various processes of ozone sterilisation, and it is necessary in comparing results obtained at various places to bear in mind the fact that one system may be more efficient than another, and that because system A. has failed to give satisfactory results at a certain town, it does not follow that system B. cannot produce a better and more economical result. There are patents and combinations of patents which certain companies or firms have acquired, or are acquiring.

The details of the Siemens De Frise process are given in Dr. Rideal's paper already referred to. Those of other systems are given in Mr. John Don's paper on the filtration and purification of water for public supply, read before the Institution of Mechanical Engineers this year, and in other papers of recent date. The author is indebted to the Lahmeyer Electrical Company for the following information:—

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The Lahmeyer ozone process has been installed or is in course of erection at the following places:—

	Galls. per day
Paris Exhibition: Project voted and passed for treatment of	10,000,000
Nice: Installation erected, treating	5,200,000
Dinard: Treating an output of	528,000
Cosne: Treating an output of	528,000
Sulina: Treating an output of	330,000
Indret Ministry of Marine: Treating an output of	16,500
Chartres: Treating an output of	1,210,000
Armentières: Treating an output of	660,000
Dinard (second installation): Treating an output of	506,000
Avranches: Treating an output of	506,000

Projects have been voted at Villefranche, Beaulieu, St. Jean, Eze, La Turbie, Gabbe-Roquebrune, Menton, Monaco, and Monte Carlo, St. Servan, and installations for 5,720,000 gallons per day are in construction for these places already.

There are many small installations in use in this country at institutions, hotels, &c., many of them being in London. The ozonisers at Wiesbaden, Paderborn and Philadelphia are well known, much having already been written about them. The fact that the Paris municipality have, after continued experiment, decided to sterilise 20,000,000 gallons of water a day by ozone processes is in itself a sufficient proof of the great importance that sterilisation is assuming.

The author is also indebted to the Lahmeyer Electrical Company for the following figures:—

Allowing twenty gallons per head per day for a town of 50,000 people, a supply of 1,000,000 gallons per day could be sterilised at a capital outlay of 4,000*l.* This would include the whole of the electrical machinery, sterilising galleries and motive power (if necessary) where no local electrical supply is available. Should an electrical supply be available the annual cost of treatment would be lower. A population of 25,000, requiring 500,000 gallons per day, would entail an outlay, under the above conditions, of 3,500*l.* The cost per 10,000 gallons of water treated would be about 5*d.* to 7½*d.*, according to the local value of the kilowatt, which usually ranges from 1*d.* to 1½*d.* per kilowatt. The cost of treating 1,750,000 gallons per diem would be about 1,168*l.* per annum. This is inclusive of labour, repairs, rates, taxes, power, depreciation of plant and sinking funds, inclusive of interest at 6 per cent. on the capital outlay of 4,500*l.* The cost of treatment of 1,000 gallons in this case works out at ½*d.*

The cost of sterilisation of sewage by ozone is estimated as follows:—

For the treatment of 600,000 gallons per day: For supplying the whole of the machinery, inclusive of erection, 2,300*l.*

For the treatment of 1,250,000 gallons per day: In accordance with the particulars given above, 3,000*l.*

The above figures give an approximate idea of the cost of ozone sterilisation, but it is impossible to compare them exactly with the prices which follow without having further details as to the quality of the water sterilised, for it is certain that the cost of the treatment must vary in proportion to the quality of the liquid to be treated. In the case of sewage, the figures relate to a liquid containing 3 grains per gallon of solids.

(To be continued).

The number of new houses erected in Torquay during the last twelve months was 133, as compared with fifty-six two years before.

Arbitration proceedings took place recently in London with reference to the Leeds Corporation acquiring 600 acres of land, forming part of the Templenewsam Estate, for the purposes of their new sewage scheme. Mr. Thomas Oldroyd, the chairman of the Leeds sewage committee, has received information that the award of Lord Robert Cecil, K.C., M.P., who acted as umpire, with Mr. Henry Hartley, of Liverpool, as arbitrator for the Leeds Corporation, and Mr. John Farrar, of Oulton, as arbitrator for the Hon. Edward F. Lindley Wood, of Templenewsam, is for the payment by the Corporation for the land required of the sum of 149,644*l.* The claim of the owner was for 235,000*l.* It is estimated that the total cost of carrying out the new project will be about 1,250,000*l.*

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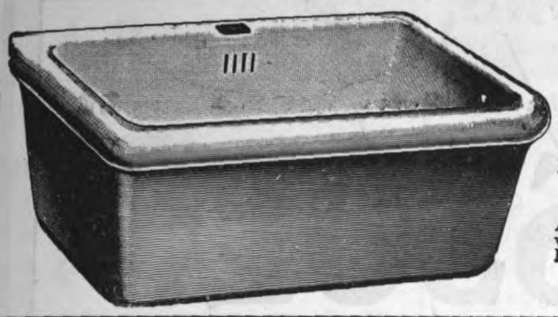
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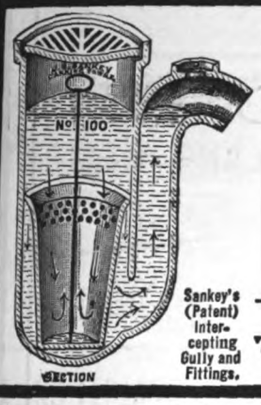


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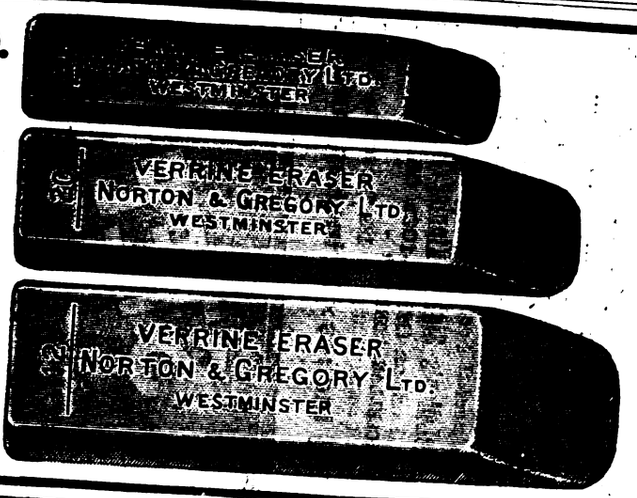
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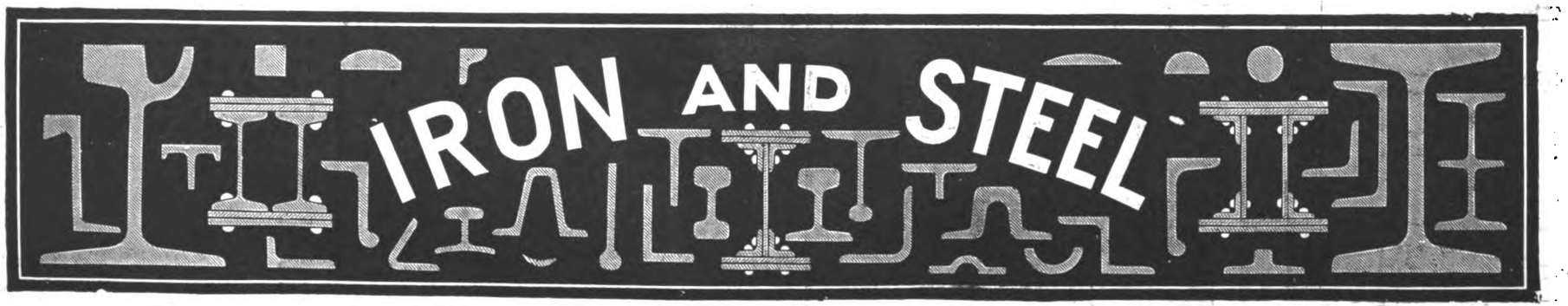
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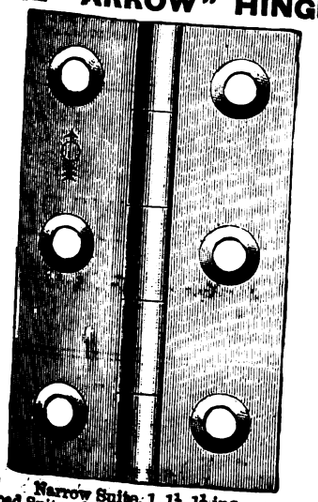
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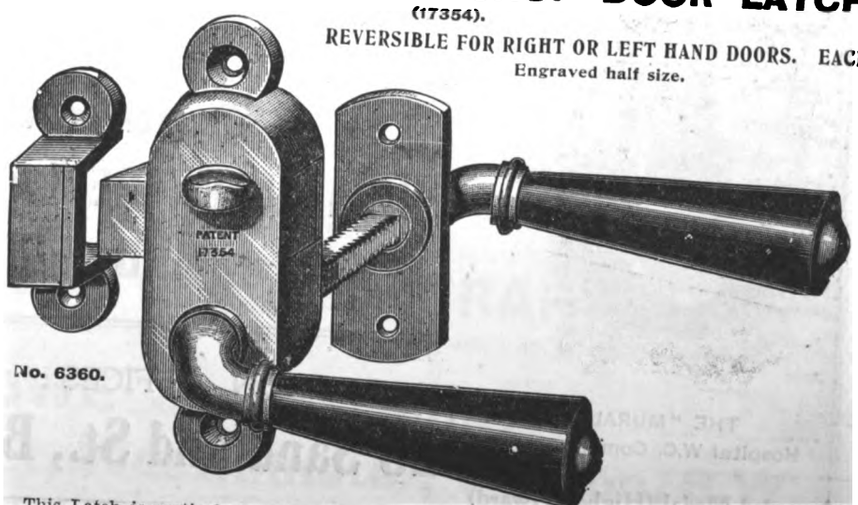
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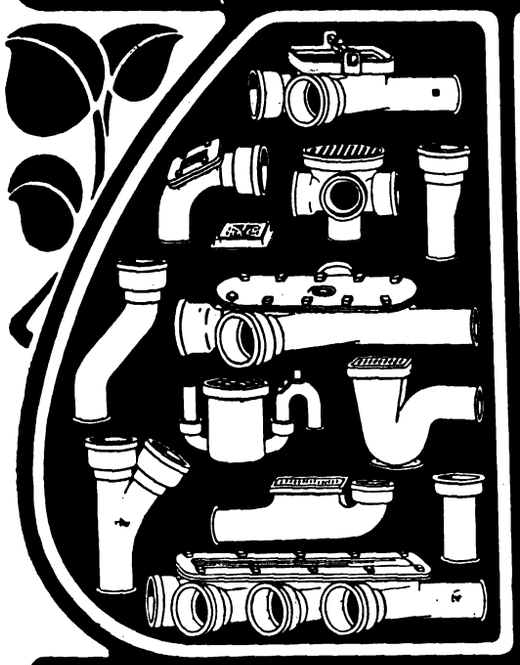
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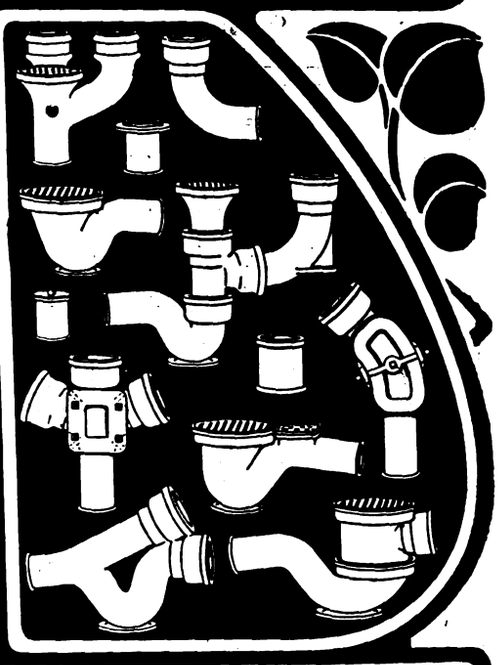
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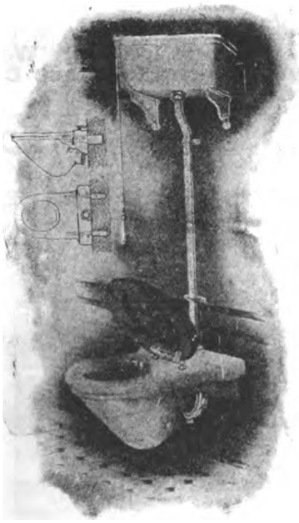


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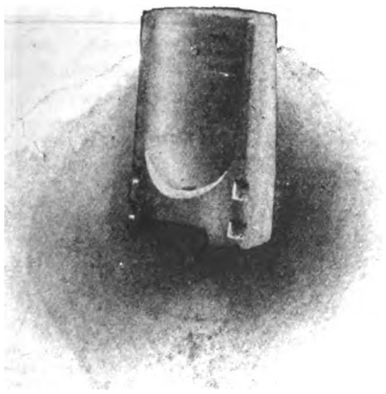
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Architect and Contract Reporter.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

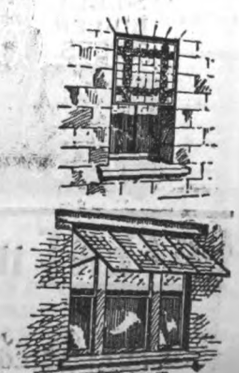
HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

HULL.—Oct. 18.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

WALES.—Oct. 1.—The Urban District Council of Aberdare invite competitive designs for a fever hospital for fifty-two patients, including administrative block, outbuildings, &c. Premiums of 100*l.*, 50*l.* and 25*l.* An assessor will be appointed on the nomination of the President of the R.I.B.A. Deposit 3*l.* 3*s.* Mr. T. Phillips, clerk, Town Hall, Aberdare.

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BELFAST.—For erection of villa residence, Upper Newtownards Road, Belfast. Messrs. Moore & Flanigan, architects, 35 Royal Avenue, Belfast.

BIRMINGHAM.—Sept. 13.—For erection of a matron's house at the infirmary, Dudley Road. Mr. W. H. Ward, Paradise Street, Birmingham.

BLACKPOOL.—Sept. 22.—For the erection of central library and art gallery. Deposit 2*l.* 2*s.* Mr. T. Loftos, town clerk, Blackpool.

BOSTON (LINCS.).—For erection of a public convenience adjoining the weighbridge house, in the cattle market, and other necessary work in connection therewith. Mr. G. E. Clarke, A.M.I.C.E., borough surveyor, Municipal Buildings, Boston.

BURNLEY.—Sept. 8.—For the several works in connection with erection of a nurses' home and alterations of the infirmary, Rakehead. Messrs. G. & S. Keighley, architects, Nicholas Street, Burnley.

CALVERLEY.—Sept. 6.—For erection of small house (all trades except painter's). Mr. Horace E. Priestley, M.S.A., 17 Bertram Road, Bradford.

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CLEVELEYS.—For erection of the church of St. Andrew's, Cleveleys, Lancs. Deposit 1*l.* 1*s.* Messrs. Grimshaw & Cunliffe, architects, Bank Buildings, Accrington.

CROWNHILL.—Sept. 8.—For rebuilding a wall at Whitleigh Gardens, Crownhill, Devon. Mr. Every, Whitleigh Gardens, Crownhill, Devon.

DONCASTER.—Sept. 11.—For erection of a greenhouse at the Cemetery. The Superintendent, Cemetery, Doncaster.

DORCHESTER.—Sept. 11.—For erection of a school in Victoria Park. Mr. Clement G. Bone, secretary, Education Office, Dorchester.

HALIFAX.—Sept. 8.—For erection of two blocks of conveniences, and rearrangement of sanitary tower at Bradshaw Mills, near Halifax. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

HENLEY-ON-THAMES.—Sept. 20.—For additions and alterations to the engine and boiler house at the Lambridge Power Station, including boiler and engine foundations and setting for economiser. Mr. E. F. Pratt, borough surveyor, Henley.

ILFRACOMBE.—Sept. 22.—For erection of business premises, The Promenade. Mr. Allen T. Hussell, F.R.I.B.A., Market Square, Ilfracombe.

IRELAND.—Sept. 7.—For erection of a fever hospital at Scariff, for the Guardians. Deposit 2*l.* Also for extending the main of the water supply system from the town of Scariff to the workhouse. Mr. W. Roseingrave, B.E., 33 Catherine Street, Limerick.

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LONDON.—Sept. 8.—For certain repairs and painting works at the Union offices, 45 Upper North Street, Poplar, E. Deposit 3*l.* 3*s.* Messrs. J. & W. Clarkson, architects, 136 High Street, Poplar, E.

LONDON.—Sept. 22.—For carrying out certain decorations and repairs to the underground convenience at Gibbs Green, West Kensington, and the urinal at Putney Bridge; and also for carrying out certain alterations to wharf and additions to wharf-keeper's house at Swan Wharf, Putney Bridge. The Borough Engineer and Surveyor, Town Hall, Fulham.

LONDON.—Sept. 29.—For the erection of a public convenience in Avenue Gardens, Station Road, Wood Green, N. Deposit 1*l.* 1*s.* The Surveyor, Town Hall, Wood Green.

LYDIARD MILLICENT.—Sept. 7.—For erection of a mortuary, disinfecting chamber and laundry at the isolation hospital, Stone Lane, Lydiard Millicent, near Swindon. Mr. R. J. Beswick, M.S.A., 10 Victoria Road, Swindon.

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NEWCASTLE-UPON-TYNE.—Sept. 15.—For erection of a block of offices in Westgate Road, for the North Eastern Railway Company. Mr. William Bell, the company's architect, Central Station, Newcastle-upon-Tyne.

PADIHAM.—Sept. 7.—For stables, cart shed, &c., to be erected in Park Road. The Surveyor, Council Offices, Padiham, Lancs.

ROCHDALE.—Sept. 8.—For erection of a gentlemen's convenience at Spotland Bridge. Mr. S. S. Platt, borough surveyor, Town Hall, Rochdale.

ROYSTON.—Sept. 6.—For erection and completion of a County Council school at Royston, Herts (accommodation, 428). Deposit 2*l.* 2*s.* Mr. Urban A. Smith, county surveyor, Hatfield.

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WALES.—Sept. 4.—For making additions and alterations at Ely Workhouse, Cardiff. Deposit 1*l.* 1*s.* Mr. E. Seward, F.R.I.B.A., Queen's Chambers, Cardiff.

WALES.—Sept. 5.—For alterations and additions to 80 Queen Street, Cardiff. Mr. J. B. Stephens, solicitor, 80 Queen Street, Cardiff.

WALES.—Sept. 6.—For alterations and additions to the Monmouthshire Reformatory, Little Mill, Pontypool. Mr. W. H. D. Caple, F.R.I.B.A., 2 Church Street, Cardiff.

WALES.—Sept. 6.—For alterations and extensions, including the building of a new school-room and class-room, to the Primitive Methodist Chapel, Pontlottyn. Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

WALES.—Sept. 7.—For erection and completion of a Welsh Baptist Chapel at Colbren, near Seven Sisters, *via* Neath. Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

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WALES.—Sept. 10.—For erection of fourteen (or more) houses at Blackwood, Mon. Mr. D. J. Thomas, architect, High Street, Blackwood, Mon.

WALES.—Sept. 11.—For (1) alterations and additions to Treharris Police Station, and (2) alterations and additions to Gowerton Police Station. The Glamorgan County Council Offices, Westgate Street, Cardiff.

WALES.—Sept. 15.—For the erection of twenty-eight cottages at Bargoed. Mr. Idris Leyshon, architect and surveyor, Hanbury Road, Bargoed.

WALES.—Sept. 16.—For the extension of the Abertillery central girls' school. Deposit 1*l.* 1*s.* Mr. W. H. Hiley, architect, Chapel Street, Abertillery.

WALES.—Sept. 18.—For erection of a county hall in the Cathays Park, Cardiff, upon foundations which have already been laid. Deposit 2*l.* 2*s.* Messrs. Harris & Moodie, architects, 8 New Square, Lincoln's Inn, London, W.C., and at the County Council Offices, Westgate Street, Cardiff.

WINGATE, &c. (DURHAM).—Sept. 21.—(1) For erection of Wingate school (300 scholars). Mr. W. Rushworth, Shire Hall, Durham. (2) For erection of Cold Hesledon school (264 scholars). Mr. J. W. F. Phillipson, Murton Chambers, 8 Grainger Street, Newcastle-on-Tyne. (3) For alterations and additions to Dean Bank school. Mr. T. W. T. Richardson, 57 High Street, Stockton-on-Tees. (4) For alterations and additions to New Penshaw and Westwood Council schools (plans, specifications and general conditions only). Mr. F. E. Coates, Shire Hall, Durham.

WOLVERHAMPTON.—For minor structural alterations at the School of Art. Deposit 1*l.* 1*s.* Mr. T. H. Fleeming, 10 Queen Square, Wolverhampton

WOLVERHAMPTON.—Sept. 7.—For erection of a high school to accommodate 400 girl scholars. Deposit 3*l.* 3*s.* Send names to the Accountant Clerk, Education Offices, Town Hall, Wolverhampton.

MESSRS. UNDERWOOD & INGREY, sports manufacturers, Northampton, propose to construct in the town extensive works or shops, equipped with the latest machinery, electrically driven, for the output of sports goods and gymnastic apparatus.

TENDERS.

BARNARD CASTLE.

For erecting a new auction mart. Mr. F. H. LIVESAY, architect and surveyor, Bishop Auckland.

Hudson	£1,228 12 11
Walker	1,181 10 8
Wilson	1,181 8 4
KYLE & SONS, Barnard Castle (*accepted*)	1,174 0 0

BEDFORD.

For extension to the Shire Hall, Bedford. Messrs. H. PERCY ADAMS & C. HOLDEN & W. H. LEETE, architects.

Beardsmore & West	£8,783 0 0
Foster & Dicksee	8,444 0 0
Longley & Co.	8,388 0 0
Dawes	8,185 0 0
Miskin & Sons	8,148 0 0
Corby & Son	8,089 0 0
Warton & Dunstall	8,085 0 0
Fryer & Co.	8,000 0 0
Roberts	7,823 0 0
Kerridge & Shaw	7,745 0 0
Willcock & Co.	7,685 0 0
Foster	7,667 0 0
Hacksley Bros.	7,589 0 0
Higgs	7,499 0 0
Brown & Son	7,450 0 0
Hickman	7,399 0 0
ARCHER & SONS, Northampton (*accepted*).	7,396 0 0

BLUNDESTON.

For erection of a Wesleyan chapel, Blundeston, near Lowestoft. Mr. R. SCOTT COCKRILL, A.R.I.B.A., architect, Lowestoft.

Spencer, Santo & Co.	£1,000 0 0
Roper	948 0 0
Cole	936 0 0
Todd	920 0 0
Wynes	875 6 3
Carter & Wright	849 0 0

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BLUNDESTON—*continued.*

Croft	847 10 0
Button & Son	825 10 0
Moore & Sons	811 0 0
Hawes & Sons	794 0 0
Balls	776 12 0
Yelf	775 0 0
Beech	765 0 0
BECKETT, Oulton Broad (*accepted*)	757 12 6
Pearman	750 0 0

BOURNEMOUTH.

For erecting a branch library at Boscombe. Mr. CHARLES T. MILES, F.R.I.B.A., Bournemouth.

Mitchell	£4,158 10 3
W. Hoare & Sons	3,952 0 0
Whitaker	3,921 0 0
F. Hoare & Sons	3,849 0 0
Jones & Sons	3,800 0 0
Bowman	3,742 18 0
Miller & Sons	3,726 0 0
Long	3,655 0 0
Jones & Seward	3,575 0 0
McWilliam & Son	3,573 0 0
Jenkins & Sons	3,553 0 0
J. & W. Hayward	3,487 0 0
GRIGG, Bournemouth (*accepted*)	3,455 17 0

EAST COWES (ISLE OF WIGHT).

For the sinking of a 11-inch bore tube from the bottom of the present well at their waterworks, for the East Cowes Urban District Council. Mr. ALBERT E. BARTON, surveyor.

H. Brown & Co.	£1,277 10 0
Le Grand & Sutcliff	918 19 0
Batchelor & Co.	905 1 10
Isler & Co.	870 17 0
W. Brown & Son	807 13 0
Potter & Co.	721 0 0
New England Boring Co.	679 18 0
Cooke & Co.	658 15 0
DUKE & OCKENDEN, Littlehampton (*accepted*)	657 8 0

DENTON.

For a school to be erected by the Kent education committee at Denton, near Gravesend, for 250 children.

Wise	£3,898 0 0
Hooker	3,841 0 0
Edwards	3,800 0 0
Martin	3,598 0 0
Brown Bros.	3,582 0 0
Spencer, Santo & Co.	3,538 0 0
Crossley & Son	3,416 0 0
West Bros.	3,382 0 0
Ingleton	3,382 0 0
Podger & Sons	3,358 0 0
Seager	3,350 0 0
Multon & Wallis	3,333 0 0
Blay	3,299 0 0
F. & G. Foster	3,296 0 0
Jones & Andrews	3,265 0 0
Gates & Sons	3,250 0 0
Archer & Son	3,243 0 0
Nightingale	3,238 0 0
Fryd	3,232 0 0
Skinner	3,217 0 0
Webster & Son	3,199 0 0
Bishop & Sons	3,192 0 0
Pavett & Sons	3,160 0 0
Friday & Ling	3,150 0 0
Tong	3,073 0 0
BAKER & SONS, Strood (*accepted*)	3,059 0 0

FOSDYKE.

For the erection of the new swing bridge across the river Welland at Fosdyke.

Arrol	£18,405 0 0
Horselet Co.	18,049 0 0
HANDYSIDE & Co., Derby (*accepted*)	16,834 1 7
Head, Wrightson & Co.	17,776 2 4

FRODSHAM.

For erection of a new house, Lime Avenue. Mr. SAMUEL DAVIES, M.S.A., architect, Frodsham.

LITTLER, Frodsham (*accepted*)	£580 0 0

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GRIMSBURY.

For the erection of Council school at Grimsbury, Northamptonshire, for the Banbury education committee. Messrs. TALBOT & FISHER, FF.R.I.B.A., Wellingborough. Quantities by Messrs. BATSTONE BROS., Cannon Street, London, E.C.

Williams & Carnall	£9,200	0	0
Creese	8,225	0	0
Orchard & Son	7,323	0	0
Cosford	7,298	0	0
Hope	7,289	0	0
Simms & Son	7,030	0	0
Booth & Son	7,000	0	0
Kingerlee & Sons	6,987	0	0
Beardsmore & West	6,974	0	0
Johnson & Son	6,947	0	0
Smith	6,820	0	0
Hickman	6,747	0	0
Hacksley Bros.	6,699	0	0
Kimberley	6,627	0	0
Goodman & Murkett	6,600	0	0
Marriott	6,582	0	0
Henson & Son	6,464	0	0
HIGGS, Northampton (*accepted*)	6,098	0	0

HANLEY (STAFFS).

For erection of a new Council chamber over the Quarter Sessions Court, Stipendiary Court Room and Grand Jury Room, for the Corporation.

Godwin (*recommended*)	£4,793	0	0

LONDON.

For forming lower fronts and window enclosures at the British Medical Association premises, Strand. Mr. E. A. FERMAUD, architect, 59 Denbigh Street, Westminster.

Arnold & Sansum	£637	10	0
Sprukley & Co.	598	0	0
Jones & Co.	571	6	0
Negus	560	0	0
HIBBERD BROS. (*accepted*)	544	12	0

LUTON.

For erection of the new schools at Luton, for the Chatham education committee.

Parkington	£13,842	0	0
Davison	12,514	0	0
Moss	12,477	0	0
Denne	12,445	0	0
Seager	12,399	0	0
Spencer	12,380	0	0
Ballard	12,380	0	0
Andrews	12,200	0	0
Foster	12,021	0	0
Baker	11,749	0	0
Phillips	11,685	0	0
Gates	11,590	0	0
West Bros.	11,279	0	0

Note.—West Bros. also tendered at 385*l.* for the extra cost of wood blocks, and the buildings and sites committee have recommended the education committee to accept West Bros.' tenders, amounting to 11,664*l.*

NEWBURY.

For the erection of new municipal offices. Mr. S. J. LEE VINCENT, A.M.I.C.E., borough surveyor.

Bance	£2,678	0	0
Chivers	2,600	0	0
H. Elms	2,610	0	0
Houghton & Hitchman	2,598	0	0
Hoskings Bros.	2,598	0	0
G. Elms	2,567	10	0
PLUMB, Newbury (*accepted*)	2,460	0	0

NOTTINGHAM.

For the erection of turning shop and latrines at Deering Street. Mr. F. S. ANTLIFF, architect, Draycott, near Derby.

Hind	£1,967	0	0
Dennett & Ingle	1,830	0	0
Pillatt	1,816	0	0
Vickers & Son	1,801	0	0
Barlow & Co.	1,795	0	0
Woodsend	1,770	0	0
Maule & Co.	1,735	0	0
MESSON, Nottingham (*accepted*)	1,680	0	0

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NORTHAMPTON.

For the rebuilding of the furniture premises of Messrs. Neudegg, Mercers' Row. Messrs. BROWN & MAYOR, architects, Northampton.

Beardsmore & West	£2,199 0 0
Higgins	2,169 0 0
Hawtin	2,130 0 0
H. Green	2,095 0 0
Fisher	2,084 0 0
Archer	2,080 0 0
Martin	2,064 0 0
Sharman & Son	2,049 0 0
E. Green	2,027 0 0
Chown	1,927 0 0
HIGGS, Northampton (*accepted*)	1,899 0 0

NORWICH.

For alterations to Birchfield Farm House, for the Norfolk County Council.

SUTTON, Upwell (*accepted*)	£190 10 0

ST. ALBANS.

For making-up, levelling, kerbing, channelling, &c., Tess, Princes, Albion and Cavendish Roads, Fleetville District. Mr. HENRY F. MENCE, surveyor, St. Albans.

Brummell	£2,639 12 3
Wilson	2,315 8 3
Powdrill	2,149 16 0
Free & Sons	1,609 4 6
WILLIAMS, St. Albans (*accepted*)	1,495 9 11
Deamer	1,383 17 2

SHARLSTON.

For erecting Sunday school, assembly hall, &c., near St. Luke Church, Sharlston, near Wakefield. Mr. J. W. COCKING, architect, Huddersfield.

Accepted tenders.

Martin, Wakefield, joiner	£330 10 6
Higgins & Pashley, Wakefield, bricklayer	316 12 5
Atkinson, Wakefield, plumber, heating, roof tiling	209 18 9
Jeffry & Co., Batley, partitions	100 0 0
Harrison, Halton, Leeds, painter	30 2 6
Illingworth, Wakefield, plasterer	27 3 7

SHEFFIELD.

For the erection of the Training College Hall of Residence for men, and for the heating and electric lighting. Messrs. GIBBS & FLOCKTON, architects, 15 St. James Road, Sheffield.

E. & W. Oxley	£14,180 0 0
Dawson, Jones & Co.	13,998 0 0
G. & D. Sheldon	13,720 0 0
Fidler	13,679 0 0
Salmon & Co.	13,399 7 9
Wilkinson & Sons	13,250 0 0
Wellerman Bros.	12,823 0 0
Gray & Sons	12,700 0 0
Unwin	12,631 0 0
Boot & Son	12,450 0 0
O'Neill & Son	12,400 0 0
Ash, Son & Biggin	12,365 0 0
W. & A. Forsdike	12,290 0 0
Longden & Son	12,200 0 0
Powell & Son	12,110 0 0
Eshelby	12,049 0 0
Freckingham & Sons	11,895 0 0
ROPER & SONS, Sheffield (*accepted*)	11,890 0 0

WEASTE.

For adding north and south aisles and seating the Victoria Memorial Church, Weaste, Manchester. Mr. E. H. LINGEN BARKER, architect.

Trask & Sons	£1,650 0 0
Carlyle	1,567 0 0
Gerrard & Son	1,560 0 0
Thorpe & Son	1,390 0 0
Hatch & Son	1,346 0 0
Ridyard	1,302 0 0
Clayton Bros.	1,300 0 0
Greenhalgh & Co.	1,289 0 0

WIMBLEDON.

For installing heating system at the Isolation Hospital, for the Borough Council.

Strode & Co., Regent's Park, N.W. (*recommended*)	£639 10 0

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WITH THE "TILT" FIRE YOU CANNOT FAIL TO GET A BRIGHT FIRE IN A FEW MINUTES.



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TRADE NOTES.

THE British Uralate Co. (1908), Ltd., have so arranged their plant, which is supplied by a large engineering firm near London, as to produce 1,000 tiles per hour. Amongst the recent export contracts was one of 70,000 feet of their asbestos slate for a West Indian port.

THE Columbian Fireproofing Co., Ltd., have secured a 14,000*l.* contract for nearly five miles of high-pressure water-pipes, 24-inch diameter, on the "Bonna" system of reinforced concrete, for the Corporation of Swansea, under the general contractors, Messrs. J. Aird & Son. In addition to the above the Columbian Fireproofing Co., Ltd., are constructing the "Bonna" pipes, 18-inch diameter, for the Clydebank Water Trustees (19,000*l.*); also for the Belfast Corporation, 21-inch diameter (1,700*l.*).

"GLUICON" is, as its name suggests, an adhesive preparation made for cabinet, joinery and furniture makers, pianoforte manufacturers, parquet flooring firms, and other businesses who have to "stick on" at least as firmly as if they "nailed on." The Gluicon Manufacturing Company, 77 Mortimer Street, W., say that it will resist extreme heat or extreme damp equally well. It is prepared and used in the same way as ordinary glue, but it differs from it in its unusual strength. The material has found very considerable favour among the London and provincial firms who have employed it.

AMONG the stands in the "Women of All Nations" Exhibition at Olympia, which was opened on Wednesday and will close on September 28, is that of Messrs. Major & Co., Ltd., who are showing the artistic pavilion originally erected by them at the Letchworth Cottage Exhibition to illustrate the effect of their wood-preserving stain Solignum, which has been used on the interior and exterior woodwork. Solignum is a valuable preparation for the treatment of all woodwork; it is cheap, easily applied, has great covering capacity and is excellent in appearance. Of special interest is a case containing the result of a most severe test made with Solignum as a protection against the "white ant." Solignum has emerged completely successful.

FOR a firm to select as a motto the two words *Esto Perpetua* shows the possession of a degree of daring that might now seem little short of rash to any but the boldest minds, for these are days of such rapid change and unforeseen developments as to produce distrust of the future. Yet such enviable self-confidence seems to be well justified in at least one case, for the Carron Company, who bear that motto, can now look back on a century and a half of commercial enterprise and steady progress. In honour of that great event a pamphlet has been produced recording and illustrating the history of the company. The prime mover in its creation was Dr. John Roebuck, of Sheffield, an eminent scientist and mineralogist, who was the first to realise the mineral wealth of the district between the Forth and the Clyde. The erection of the works was commenced in 1759 on the north bank of the river Carron, and on January 1, 1760, amidst general congratulations, the first pig iron was produced. Since then the company has played a part in the national, artistic and commercial life of the nation of which it may well be proud, and has helped to build up the reputation honourably held by this country for distributing throughout the world manufactures that are second to none. The souvenir booklet conveys a good idea of the ramifications and achievements of the Carron Company in a hundred and fifty years. It would be unwise to prophesy, so we can only say of the company "Esto Perpetua."

THE American Consul at Port au Prince, Haiti, John B. Terres, reports that during the last three years the United States has lost its entire cement trade in Haiti. On inquiry as to the reason he was informed by merchants who formerly imported American cement that they had to abandon importations from the United States on account of the loss sustained owing to the bad condition of the barrels on arrival. These merchants now buy from Germany, England and Belgium. The European cement is packed in barrels lined with paper and hooped with iron, and arrives in good condition.

ROTHESAY School Board have agreed to abandon the scheme of erecting a new junior school within the grounds and to adopt the alternative scheme of a reconstruction and enlargement of the present Academy building. The plans provide for a large central hall from which access can be had direct to the various class-rooms, those in the upper storey entering from the balcony. The cost of the scheme is expected to approach 6,000*l.*

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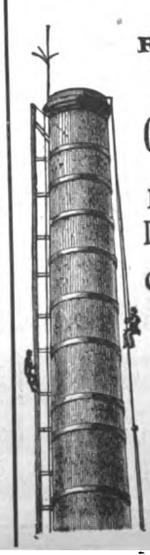
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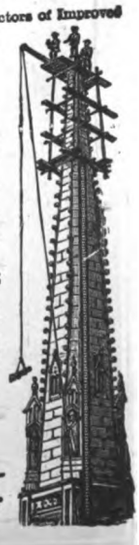
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VARIETIES.

THE plans committee of the Aberdeen Town Council have approved the plans for the extension of the Aberdeen Royal Infirmary. The value of the work is about 11,000*l.*

THE Lancashire Asylums Board have authorised the committee of visitors at Prestwich Asylum to prepare plans and estimates for the approval of the Board for an infirmary to accommodate 100 female patients, and for two villa blocks to provide separate accommodation for fifty private patients of each sex.

ACCORDING to *Kemp's Mercantile Gazette*, the total number of commercial failures recorded in England and Wales during the week ending Friday, August 27, was 124. There were thirteen failures in the building trades, as against eleven in the corresponding week in 1908 and twenty-three in 1907.

THE North Dublin Rural District Council have recently adopted a scheme under the Labourers' Acts which has been postponed from time to time for the last two months. Mr. Morris, clerk of works and architect, estimated the cost of the scheme at 19,278*l.*, and it provides for the erection of ninety-seven new cottages and fourteen additional allotments. There are 550 cottages already erected in the Union.

THE substantial and picturesque new bridge over the river Wey at Guildford was formally opened on the 25th ult. It was erected from the designs of Messrs. Clemence & Moon, architects, Guildford, with Messrs. Henry Adams & Son, of 60 Queen Victoria Street, E.C., acting as consulting engineers. The cost was defrayed by public subscription.

THE directors of the Fife Coal Company have had before them recently plans for the erection of a large number of workmen's houses at Valleyfield, where they are sinking two of the largest pits in Scotland. It is expected that the pits will give employment to between 1,500 and 2,000 men when completed two years hence, and provision will require to be made for the greater number.

"ENGINEERING Day," under the presidency of the Lord Mayor of London, will be held at the Imperial International Exhibition, White City, to-morrow (Saturday). Over 20,000 invitations have been sent out to leading mining and other engineers of the country, and a large gathering of influential gentlemen is expected. There will be a series of special demonstrations in the Machinery Hall and of lectures in the Congress Hall.

THE report of the Philadelphia Bureau of Building Inspection for July shows that the value of the work for which permits were issued during the month was $985,110 in excess of the value of the construction begun in July, 1908. The permits granted last month covered 1,541 operations costing $3,897,590, against 1,298 operations costing $2,912,480 in July of last year. Taking the total value of the work done during the current year to the end of July we find it to be $25,792,340, spread over 10,956 operations, compared with $16,679,990 and 7,908 operations for the corresponding period of 1908.

THE Newcastle Board of Guardians considered on Friday plans for extensions and additions at the cottage homes, involving an estimated expenditure of about 11,700*l.* The scheme included the extension of the school at a cost of 3,750*l.*; extension of the homes by one double block to accommodate thirty children, 2,800*l.*; erection of a sick and isolation cottage and doctor's dispensary, with accommodation for thirty-nine beds, 3,790*l.*; and 415*l.* for road-making. The scheme was, after discussion, deferred for final consideration for a fortnight.

A SPECIAL meeting of the Llandrindod Wells Urban District Council was held last week to consider a letter from the Local Government Board relative to their application for a loan of 10,000*l.* for the erection of a pavilion in the recreation ground. The Local Government Board wrote stating that whilst they saw no objection to the erection of a pavilion, they could not sanction a loan of 10,000*l.* for the purpose, and the Council were asked to reconsider the proposals. The Chairman reported that he had had an interview with Mr. John Burns, M.P., on the subject. Mr. Burns had insisted on the reduction of the scheme to a cost of about 5,000*l.* The design is to be modified accordingly.

AT a recent meeting of the Dundee Housing and Town Planning Committee a report submitted by Mr. Walsh and the City Engineer in reference to their attendance as delegates at the National Town Planning Congress was considered. The report stated that the information gained

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from papers, discussions, and inspections would prove of value when the Town Council proceeded to consider the working of the Housing and Town Planning Act, or to formulate any scheme of town planning or of housing for Dundee. Keeping Dundee and the local situation always in mind, the delegates were confirmed in their belief that few cities more required, or could more quickly profit by, improved housing and town planning. The Congress gave the impression that a new day was dawning, and that municipalities would be able to engage in measures for improvement far more hopefully than hitherto. In their visits to various places the delegates were impressed by the large areas devoted to open spaces, and especially noted the accommodation provided in houses varying in cost from 200*l.* to 350*l.*, and they were satisfied that if suitable ground could be acquired a commencement might be made on a well-arranged plan with houses of about ten to the acre; and towards that end it was suggested that the Council be shortly asked to consider as to acquiring a suitable portion of property in an accessible district at a reasonable price.

A GREAT cement combine is, as we stated last week, being formed in Canada by the amalgamation of a number of cement manufacturers. According to the *Glasgow Herald*, the new company is called the Canadian Consolidated Cement Company. It will include all the large plants in the Dominion, and it will have a capital of $25,000,000. The consumption of cement in Canada last year was 3,134,358 barrels, an increase over the previous year of 25,615 barrels. The production of cement in Canada in the same year was 3,495,961 barrels of 350 lb. each. This was an increase on the previous year of 1,004,448 barrels. The increase in production last year was thus much greater than the increase in consumption, and the capacity of the plants is for greater increase still. There are now twenty-three cement factories, and the capacity of these is 27,100 barrels per day, which is equal to 8,250,000 barrels per annum, or three times the present consumption. Then there are imports, which last year were to the value of $800,000.

A SHORT article appeared in these columns on August 13 relative to the advantages of Fishguard as a port of call for the Transatlantic liners. Everything then said has been abundantly justified by the record created by the arrival of the *Mauretania* at the Pembrokeshire port on Monday. London is now six hours nearer New York than it was a week ago, and the journey from the capital of the United States to the metropolis of the British Empire comes well within the limit of five days. Both the Great Western Railway and Cunard steamship company are entitled to the congratulations of both countries. The railway company will now reap the full benefit of their foresight and enterprise which led them to undertake the construction of a magnificent harbour at Fishguard—a work that is not yet complete. Exactly three years previous to the arrival of the *Mauretania* the Fishguard-Rosslare route to Ireland was inaugurated, and this has been ever since used by a steadily increasing number of tourists. There is no need to mention here the admirable organisation of the Great Western Company, which enabled the passengers, mails and baggage to be transferred from the *Mauretania* and despatched to their destinations in record time, for this was fully described in the London and provincial newspapers of Tuesday last. It should be mentioned that Brunel foresaw the possibilities of Fishguard, but he was prohibited from proving them by the engineering difficulties.

LONDON TRADE SCHOOLS.

AMONG the papers read at the meeting of the British Association was one by C. W. Kimmins, M.A., D.Sc., dealing with London Trade Schools. In the course of his remarks the lecturer said the problem of problems in London and elsewhere is to prevent children of fourteen years of age drifting into unskilled labour in which there is no element of permanence. The difficulty is increased by the decay and gradual disappearance of the apprenticeship system and the altered conditions of employment in workshops which make them unsuitable places for the training of craftsmen.

An elaborate scheme of junior intermediate and senior scholarships established by the London County Council makes ample provision for the brilliant children of the London elementary schools. The really capable child, even of the poorest parents, may reach the highest position by



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means of the scholarship ladder, passing at the age of eleven years into the secondary school, and thence by means of scholarships at the age of nineteen to the University or higher technical school. Provision is also made for the transference of children who do not reach scholarship standard to pass on to a higher form of elementary school in which a special bias may be given in training for commercial or industrial life in a course of instruction extending for a year or two beyond the age of compulsory attendance.

The trade school, however, is of a very special type for children who have to enter upon their life's work at the age of sixteen or seventeen, and who have already decided upon the trade they wish to enter. The age of entry into the trade school coincides aproximately with that at which the boy or girl normally leaves the elementary school, viz. thirteen or fourteen years of age, and the course of instruction lasts for two or three years.

In London the boy or girl of fourteen who is physically strong and has received a fairly good education, has no difficulty whatever in obtaining employment at a rate of remuneration which appears liberal for a child of this age. The consequence is that in the elementary school the vast majority of the children leave immediately they reach the age of fourteen and become wage-earners. In order to keep children at school above the compulsory age for any definite period it is absolutely necessary not only to give them free education, but, in addition, maintenance scholarships which will recoup the parents to a certain extent for the loss of the earnings of the children.

The scholarships for trade schools for boys extending over a period of three years are generally of the value of 6*l.* for the first year, 10*l.* for the second, and 15*l.* for the third year. The trade schools for girls generally have a two years' course, and the value of the scholarships is 8*l.* for the first and 12*l.* for the second year. Unsuccessful candidates who do not obtain scholarships may be awarded free places. For other pupils a low fee of generally 10s. a term is charged.

No candidate is eligible for a scholarship whose parents or guardians have an income which exceeds 160*l.* a year from all sources.

The special features of the London Trade Schools are:—

1. The assistance given in the direction of the trade teaching by consultative committees of business men and women engaged in the particular trades for the training in which the school provides.

2. The appointment of after-care committees, the members of which interest themselves in the scholars and advise them with regard to employment at the conclusion of the school course, and afterwards see that the conditions of their employment are satisfactory.

3. The continuance of the general education of the pupils, only about one-half to two-thirds of the school time being given to actual workshop instruction.

4. The prominence given to art instruction, not only in the technical requirements for the particular trade, but for the general development of a high standard of taste.

5. The employment of teachers who have attained distinction as practical workers, and who approximate the instruction as far as possible to workshop conditions.

6. The holding of exhibitions of students' work to which employers are invited and at which offers are frequently made for the employment of students.

Trade schools for boys have been established in engineering, silversmithing, bookbinding, furniture and cabinet making, carriage building, art woodcarving, and various branches of the building trades. The trades for which schools have been established for girls are trade dressmaking, laundry work, upholstery, ladies' tailoring, waistcoat making, corset making, millinery, designing and making of ready-made clothing, and photography.

The development of trade schools in London is proceeding rapidly. The competition for the scholarships is becoming keener every year, and the work of the students is finding increasing favour with employers. No difficulty is experienced in finding suitable employment for boys and girls who have passed through the schools successfully.

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BUILDING AND BUILDERS.

FURTHER improvements are to be undertaken at the York racecourse, including the reconstruction of the 5*s.* ring and roofing of the enclosure.

THE Birkenhead Town Council have accepted the tender of Mr. P. Rothwell, of Birkenhead, for the erection of a school in Brassey Street. A loan of 17,306*l.* is to be raised for the purpose.

A FIRM of Glasgow builders are in negotiation with Lord Elgin for fifteen acres of land for feuing purposes near Dunfermline Corporation gasworks immediately to the south of the town. There is at present a great scarcity of houses in Dunfermline and district.

THE Bootle Town Council have just approved the plans and estimates of the proposed construction of a new road called Northfield North, at an estimated cost of 6,290*l.*, together with 325*l.* for filling up the land, and in connection with it the widening and reconstruction of Linacre Lane and Moss Lane at an estimated cost of 5,360*l.*

THE ancient tithe barn, first erected in the year 1306, and belonging to the Abbey of Peterborough, was pulled down at Peterborough some years ago and the materials purchased by Mr. Fox, F.S.A., of London, who has now offered them to the Peterborough Town Council, with a view to their re-erection on another site. The building was 40 feet high, 80 feet long, and 32 feet wide. The Council will give a reply in about a fortnight.

THE Bakewell Urban Council have abandoned their scheme for the erection of baths and pump-room. The proposal first came up twelve years ago, and on Tuesday a tender amounting to 3,200*l.* was recommended for acceptance which had been submitted by one of the members, who resigned his seat on the Council prior to the tenders for the baths being opened. The scheme was abandoned on the chairman's casting vote last Wednesday.

A MEETING of the Sugar Beet Growers' Syndicate of England was held at Sleaford on Wednesday, Major W. V. R. Fane, of Fulbeck Hall, presiding. It was announced that contracts had been signed for the requisite acreage of land in the county for growing the beet, and it was resolved to proceed with the erection of the proposed factory at Sleaford. The capital of the company is 100,000*l.* Arrangements were made for the appointment of a consulting engineer.

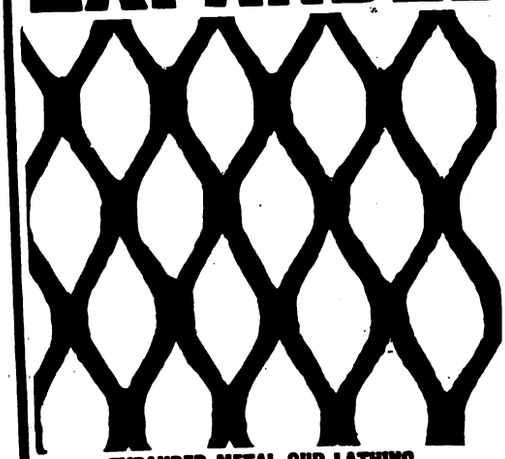
THE Liverpool City Council on Wednesday decided, after considering the report of Mr. J. T. Alexander, city building surveyor, that "while recognising the desirability of having a bath fixed in every house, they do not see their way to recommend that powers should be sought to make it compulsory to provide a bath in every dwelling-house." It was at the same meeting agreed to apply to the Local Government Board for sanction to borrow 12,500*l.* to enable "three chapels to be erected in the Allerton Cemetery, such chapels to be erected upon parts of the ground which are not consecrated or set apart for the exclusive use of any particular denomination, and not to be consecrated or reserved."

AT Bentley an inquiry was held on Wednesday by Mr. E. A. Sandford Fawcett, M.I.C.E., on behalf of the Local Government Board, into an application by the Doncaster Rural District Council for power to borrow an additional 3,000*l.* for sewage disposal work in the parish of Bentley-with-Arksey. Mr. Balfour, of the firm of Messrs. Balfour & Sons, the engineers, said that the original scheme, for which application had been made to borrow 3,400*l.*, was for the drainage of 200 houses to be put up by the Bentley Colliery Company and the drainage of Rostholme. Further developments had since taken place, and plans had been submitted by the colliery company for many more houses, 776 in all, which, together with 200 other houses in course of erection and proposed to be erected in the area, made practically 1,000. The scheme provided for the drainage of 1,300 houses. Several of these houses have been already built, but without a proper system of drainage.

THE Guatemalan Legislature have decided to build a new opera house on modern lines having a seating capacity for 2,500 persons.

THE decision of the Board of Trade arbitrator in the Swansea painting trade dispute was delivered on Tuesday. The men's demand for an extra halfpenny per hour has not been conceded. The men are, however, granted overtime at the rate of a halfpenny per hour increase betwen five and seven in the evening.

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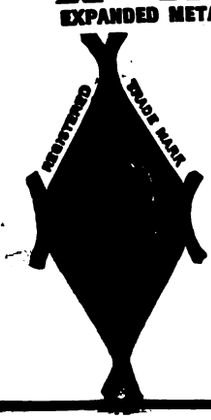
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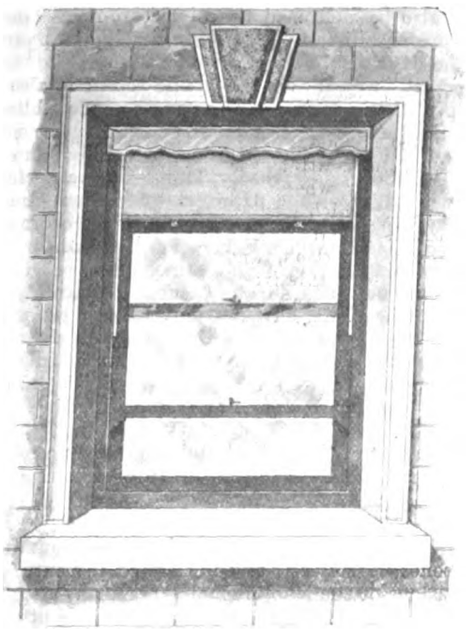
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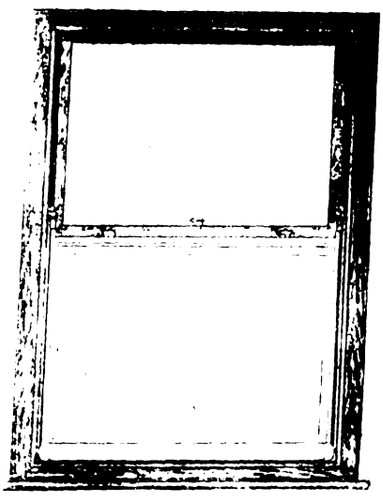
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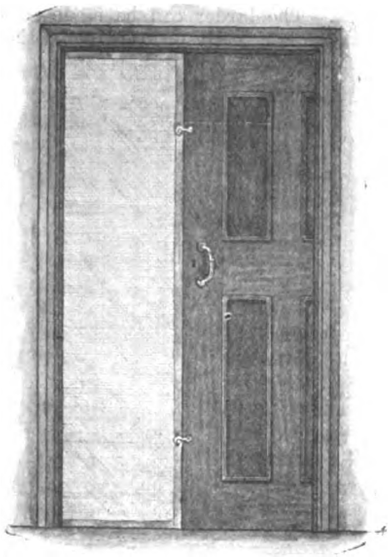
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and becoming disarranged is not experienced. Fine goods show-rooms, where ventilation is so necessary, are freed from the value-destroying "blacks" which accompany all attempts at ventilation where the new hygienic screen is not affixed. Provision shops, confectioners, dairies, and other

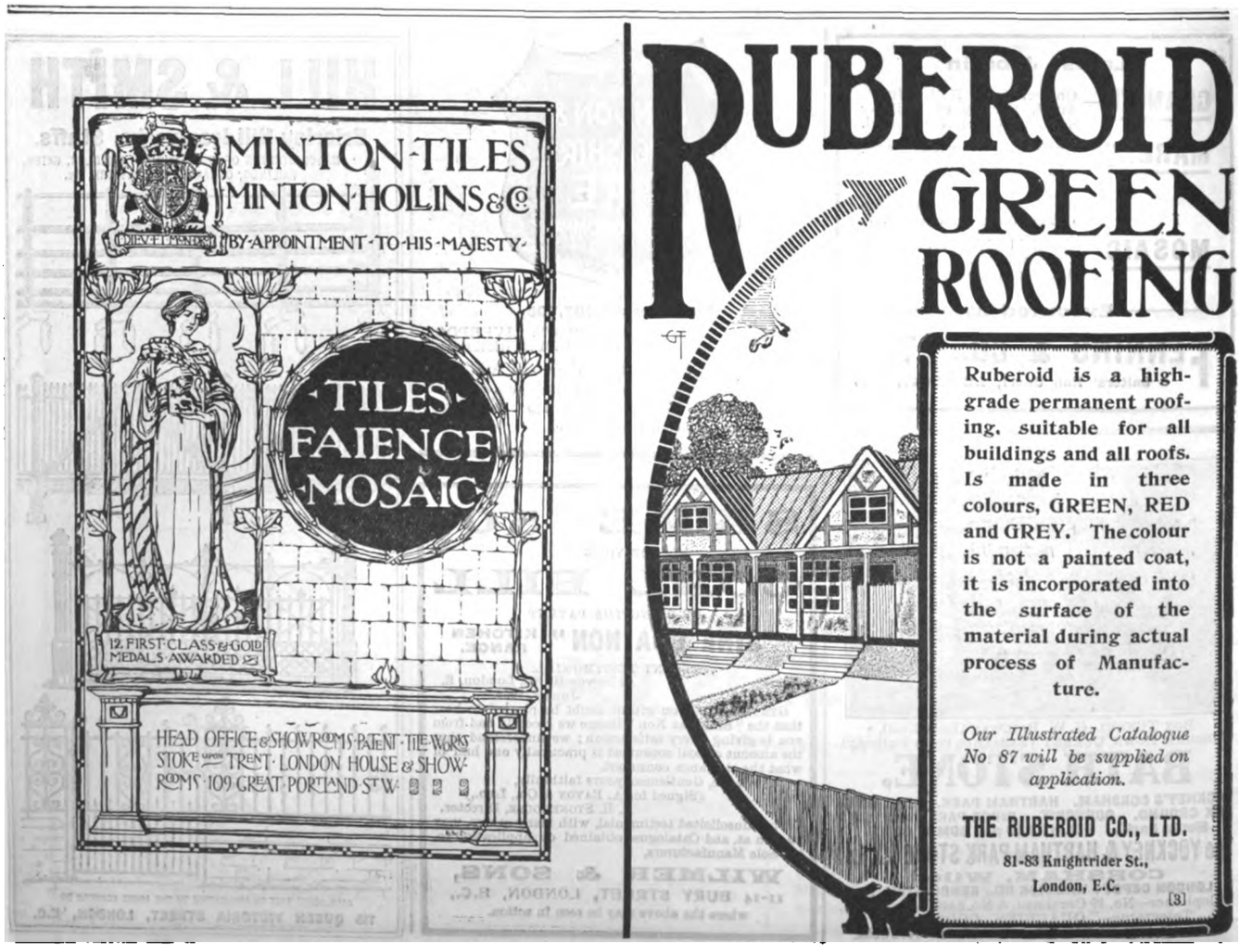


FITTED TO SLIDING DOOR.

similar business concerns can present their goods to the full view of the public, and at the same time have that delightful current of fresh air which preserves their goods and greatly benefits the consumer and customer. Hotels, public rooms, and similar places where large numbers congregate will find the instalment of the new hygienic screen of great benefit. In the tropics and other places where the mosquito holds sway the new hygienic screen will be looked upon as an unexampled blessing. A variant on the hygienic screen is obtained by the substitution of an opaque material for the gauze by which all light is excluded and the chamber made perfectly dark. This will be of great advantage to the amateur photographer who, at very slight expense, can immediately transform his bath-room or any other room into a perfect dark room, or by the substitution of other materials of the necessary colour into a toning-room. This form will also be welcomed by all lecture-rooms and other places where the dissolving view or limelight apparatus is used in the daytime.

The principle of the new hygienic screen is also admirably adapted for use with the ordinary window blind, that is to say, the sides of the blinds are engaged in the side slots, which are fitted down the whole of each side of the window to which the blind is attached. This secures a perfectly flat surface to the blind when drawn down without the "billying" or flapping which is so annoying in the ordinary blind when a wind is blowing. For roofs of greenhouses, photographic studios, markets, and other large buildings with glass roofs the use of this frame secures the blind lying quite flat against the roof and thus preventing dust settling on top of the blind, consequently the blind, which is operated by cords in the ordinary manner, may remain drawn for any period, and when it is allowed to recede into its case there is no fear of dust falling and so spoiling any goods which may be on view in the market or other place. The slight extra cost of the roller blind should be no preventative to a large trade being done, the advantages being so obvious.

IN a large majority of cases the underground rooms in Marylebone are believed to be occupied in contravention of the provisions of the Public Health (London) Act, 1891, but, says the local medical officer of health, "it is utterly useless to attempt to deal with these on the strict lines of the Act, for, even supposing that the staff of inspectors were sufficient to discover all those illegally occupied, the enforcement of notices to quit or to occupy the underground room only in conjunction with a room on the upper floor would involve the displacement of hundreds of families who literally cannot find accommodation such as they require at a rent that they can afford."



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THE PRACTICAL STERILISATION OF WATER AND OF SEWAGE EFFLUENTS.*

(Continued from last week.)

Hypochlorite Sterilisation for Water.

THE sterilisation of drinking water by means of hypochlorite is obviously possible, and seeing that the cost of the treatment and of the plant itself would be so very much less than in the case of ozone, it surely is the duty of any person who has the installation of sterilising plant for a town supply under consideration to make a thorough investigation as to the possibilities. If it was possible to sterilise the water supply of the city of Lincoln for an extended period with chemically prepared hypochlorite administered in very strong doses, the water being of very bad quality, with a large amount of suspended matter in it to give trouble, it must surely be possible to obtain a very much better result with electrolytic hypochlorite, which is much more active. At any rate, in cases where the water to be treated contains a very small quantity of organic matter, there can be no doubt that with the small quantity of available chlorine that would be required it would be quite impossible to detect any change in the taste or appearance of the water. Seeing also how easy it would be to carry out an experiment, owing to the fact that the sterilising agent can be carried from place to place in an ordinary bottle, it is quite a simple matter for anyone to make an experiment with any particular water in order to ascertain the exact effect of such treatment. There are a large number of places in this country which could be supplied with water at comparatively small cost, provided that water could be efficiently purified, and there are a large number of places where at the present time water of questionable quality is being consumed.

It is unreasonable to pretend that the presence of, say, 1 or 2 parts per 1,000,000 of available chlorine could possibly affect the taste of the water. An unpleasant taste could only result in cases where the water contained a large quantity of suspended matter and required treatment with a much larger proportion of chlorine.

* A paper read at the Building Trades Exhibition by H. C. H. Shenton, M.S.E.

Chlorine Sterilisation.

There are several electrolysers for the production of hypochlorites. Roughly, the method of preparation is as follows:—A solution of common salt—i.e., sodium chloride—is prepared and through this an electrical current is sent, with the result that the sodium chloride is split up into its component parts of sodium and chlorine. The chlorine is liberated at the electrode connected to the positive pole of the source of the electricity supply, and the sodium is also liberated at the electrode connected to the negative terminal. Chemists are not wholly agreed as to the exact detail of what takes place, but, for practical purposes, it may be said that the sodium and chlorine recombine with one part of oxygen to form hypochlorite, in which the chlorine is in a particularly active condition, and that this liquid contains a quantity of free chlorine and oxygen, and that it is valuable as a sterilising agent in contact with organic matters: the oxygen present in the hypochlorite is liberated. Very minute quantities of the hypochlorite have to be used, and after the work of sterilisation is effected and the oxygen released, the available chlorine reverts to its inert form of sodium chloride.

Dr. Rideal, who has applied solutions from the Digby electrolyser to the treatment of tap and lake water for the elimination of algæ and confervoid growth, said, in a paper read at the Bristol meeting of the Royal Sanitary Institute:—"This solution, besides having the advantage of cheapness, contains but little undecomposed sodium chloride, and consequently the final addition of chloride to the treated water is very small." In the case of tap water treated for conferva, "practically the only alteration in the chemical analysis is a reduction of the oxygen consumed figure, and an increase of the chloride from 2.1 to 2.4 parts per 100,000."

Hermite.

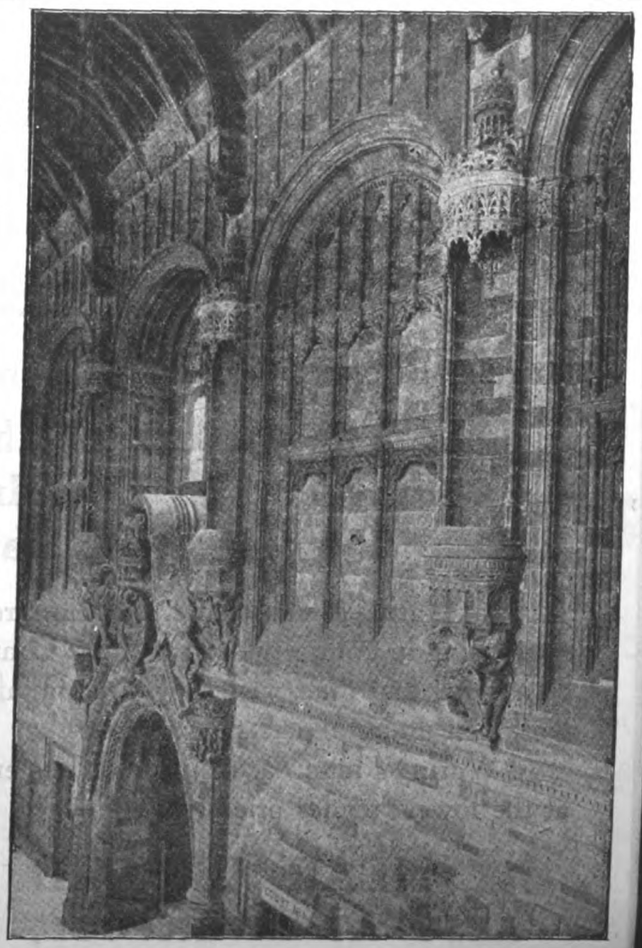
In a paper read before the Faraday Society in 1906 Mr. Charles V. Biggs described the Hermite plant installed by Dr. Alexander and in use at Poplar, and as this gives prices it is of particular interest. The total space occupied by the electrolysing plant, including the tank, is 7 feet by 7 feet. The capacity of the tank is about 215 gallons; the total headroom is 10 feet. During a run of eight hours, 108 gallons of hypochlorite solution, at a strength of over 4 grammes per

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litre (i.e., a 0.4 per cent. solution), are made. The tank is charged by placing in it 100 litres of a saturated solution of sodium chloride and 20 litres of a saturated solution of magnesium chloride. To this is added as much water as is needed to bring the whole quantity up to 840 litres (185 gallons). The liquid flows from a pipe in the bottom of a tank, at the end of which is a ball valve, into a small flushing cistern at the side, in order to obtain an even flow; otherwise, as the tank emptied the flow would be slower. Thence it flows through another pipe into a funnel leading to the first row of cells. The second pipe mentioned has a cock for regulating the flow. The flow adopted is 3⅓ pints (1.9 litres) per minute. This works out at 25 gallons (103.5 litres) per hour, or about 185 gallons (840 litres) in eight hours. The plant is designed to work at 15 ampères and a flow of 1.9 litres per minute. The manufacture of the hypochlorite solutions is carried on by a process which is practically automatic. For an output of 200 gallons per eight hours at 4 grammes per litre (a 0.4 per cent. solution) the capital cost, including buildings and fittings, would be about 500*l*. With regard to running costs, the sodium chloride at 40*s*. per ton, magnesium chloride at 5*l*. per ton, 185 gallons of hypochlorite can be produced for 9*s*.—that is to say, 1*s*. 6*d*. for salt, 1*s*. for magnesium chloride, 2*s*. 6*d*. for electric current, and 4*s*. for attendance and labour. Seeing that 185 gallons of a 0.4 per cent. solution of hypochlorite would contain 3.37 kilogrammes of available chlorine, this plant produces sufficient hypochlorite to sterilise 180,000 gallons per diem, allowing four parts per 1,000,000 of available chlorine. The liquid thus produced is used at Poplar for disinfecting purposes, such as road-watering. It should be observed that the objection formerly urged against this process, that the product was unstable, does not now hold. Such a plant as this would apparently serve a town with a population of 6,000.

Oxychlorides.

Dr. Rideal, in a paper read recently before the Faraday Society, described the oxychlorides process in use at Guildford. In this paper the results of very important experiments were given. It is to be noted that prices were not given in this paper, but there is enough evidence as to the approximate cost of the production of electrolytic hypochlorite for anyone interested in the subject to come to some conclusion as to the cost of carrying out works similar to those recommended by Dr. Rideal. The first series of experiments made by Dr. Rideal in 1904 showed the efficiency of electrolytic hypochlorite as an oxidiser, deodoriser or germicide of sewages and effluents. Early experiments proved that if one part per 100,000 of available chlorine were added at the inlet of a branch pipe through which septic effluent were passing, at the rate of 1,000 gallons per hour, the pipe being 40 feet long and 2½-inch bore, the liquid would be deodorised in passing through the pipe. "At the commencement a strong foul odour existed at the receiving chamber. The liquid was deodorised in passing through the pipe, and in less than an hour the whole tank had lost its odour." A large number of other experiments showed, first, that it was possible to deodorise septic tank effluent without in any way interfering with subsequent filtration. It might have been expected that a sterilising agent would have affected the bacteria in the filter-beds so as to lessen their action, but this was not found to be the case, even though very strong mixtures of hypochlorite and sewage were discharged on to the filter. The possibility of thus deodorising sewage or killing the harmful germs in it by means of a sterilising agent without interfering with subsequent filtration is a very important fact, for it is well-known that the nuisance from septic tank effluents discharged on to filters is very great at many places, and in some cases, especially where brewery refuse is present in the sewage, it would be very beneficial if something could be done to do away with this nuisance. But a much more important fact was ascertained in these experiments—viz., that by the addition of hypochlorite to the tank effluent, clogging growths can be dissolved and washed speedily from filters. It was also found that an addition of strong hypochlorite would prevent the sprinkler from becoming clogged with growths, and it was also established that filters that have been thus treated quickly recover under normal conditions. It was proved that a filter can be successfully matured when hypochlorite is used in such quantities as are required for preventing aërial nuisance, and it even appeared that a bed could be thus matured at a quicker rate than with untreated tank liquor.

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Ohio Experiments—Chlorine and Copper Sulphate.

The investigations of Kellerman, Pratt and Kimberley, for the Ohio State Board (United States Department of Agriculture, Bulletin No. 115, October, 1907), give economical results obtained with a solution of chloride of lime, and these investigators, together with Messrs. Phelps and Carpenter, already quoted, appear to have no doubt that more economical results are to be obtained by the use of hypochlorite produced by electrolytic methods, and it is to be hoped that the Ohio State Board will supplement these experiments with others, carried out with electrolytic hypochlorite. The experiments mentioned in the Ohio State report are of such interest that a brief summary with extracts in the present paper will not be misplaced. Copper sulphate experiments were made before the chlorine experiments, and it was clearly established that chlorine, even in the chemical form, was very much more economical than copper sulphate.

Copper Sulphate Experiments.

At St. Mary's of the Springs sewage from a school was treated, the population being about 175 persons. The sewage is discharged into two tanks operated in series. The tanks are 10 feet in diameter and 6 feet deep, the capacity of each being 3,050 gallons. The flow of sewage is about 12,000 gallons per diem; the sewage discharges from the second tank into a small brook. Dating from September, 1905, it has been the daily practice of the health department of the city of Columbus, Ohio, to apply copper sulphate to the sewage at the inlet of the second tank, the quantity of copper sulphate added daily being 6 lb., 3 lb. of which are introduced at 9 a.m. and the remainder at 3 p.m., roughly approximating to a concentration of 63 parts per 1,000,000. The copper sulphate in a dry state is placed in a perforated enamelled pail, which is lowered into the liquid at a point opposite the discharge pipe from the first reservoir The copper sulphate remains here and is dissolved by incoming sewage. The treatment removed from 98.98 to 98.99 per cent. of the bacteria. With copper sulphate 6 cents a pound, and a daily sewage flow of 12,000 gallons, the expenditure for chemicals is 3 cents (1½*d.*) per 1,000 gallons; the labour cost is 25 cents (1*s.* 0½*d.*) per day; the annual cost of treatment equals $222.65 (44*l.* 10*s.*), representing an investment of $4,500 (900*l.*). This is distinctly a high price to pay for sterilising the sewage, but, on the other hand, it must be remembered that the treatment is reduced to a minimum, and that poison from pathogenic germs is entirely prevented. Such treatment might be very useful in the case of a private house or institution polluting a river used for drinking-water purposes, and would, according to scientific data, be very much more efficient in preventing the possibility of disease than a much more elaborate system of filters. However, the idea of permitting even sterilised sewage to go into a stream is very objectionable, and there can be no doubt that it would be better to incur the cost of filtration works, and to pay less for the sterilisation, seeing that a filter effluent could be sterilised at a much lower rate.

At Westerville, Ohio, the sewage plant comprises two small septic tanks, which discharge through an aërating device on to six primary contact filters, which in turn discharge on to two secondary filters. The plant, at the time the experiments were carried out, was operated continuously instead of upon the contact principle, which may account for the high rate of cost. The computed discharge is 41,000 gallons in twenty-four hours. "Copper crystals were dissolved in barrels connected in series. The solution in the barrels was conducted to an orifice box where, by means of a ballcock, a constant head was maintained upon an adjustable orifice. The quantity of copper sulphate used in each test was based upon the computed flow of 41,000 gallons of effluent in twenty-four hours." After passing through the orifice box the copper solution was discharged into a small storage reservoir at the same point where the discharge from the sewage effluent orifice box was admitted; the rate of discharge was 0.5 gallon per minute. At the point of entrance of the sewage effluent and the copper solution there was placed a small longitudinal baffle, serving to effect a thorough mixture of the chemical and the effluent. The storage period, or time of contact of sewage and copper sulphate, was slightly over one hour. On a basis of treating daily 41,000 gallons of effluent from the primary contact filters, the initial cost of the plant would be about $70 (14*l.*). The cost of the chemicals would be about 82 cents (3*s.* 5*d.*), and the cost of labour about 50 cents (2*s.* 1*d.*) per diem. The

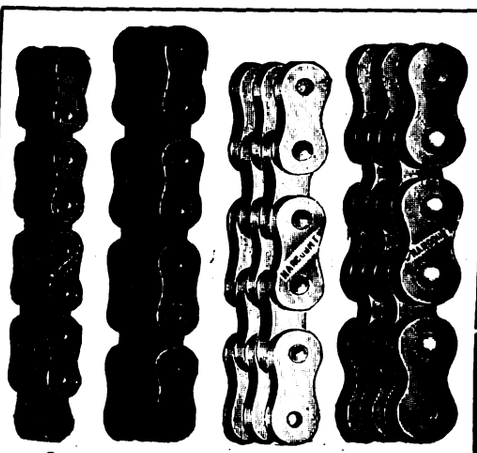
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annual cost with copper sulphate at 6 cents (3*d.*) a pound, and labour 25 cents (1*s.* 0½*d.*) an hour, would be $482.5 (96*l.* 10*s.*); capitalised at 5 per cent this would represent an investment of $9,650 (1,930*l.*).

At the Boys' Industrial School, a State institution at Lancaster, Ohio, with a population of 1,100 persons, the sewage is treated on twenty-three sand filters, which receive screened crude sewage. The sewage flow averages about 160,000 gallons in twenty-four hours. At the outlet of the effluent drain a weir was constructed, having a length of 1 foot and a height of 15 inches. Over this the sewage effluent was caused to flow. Suitable means were provided for observing the elevation of water on the crest of the weir. The effluent drain discharged into a small brook in which a dam was constructed about 200 feet from the weir. This improvised reservoir gave a storage period of from three to four hours, depending on the rate of flow from the filters. The quantity of copper sulphate applied was based on the sewage flow of 150,000 gallons. The rate of flow of the copper solution was practically constant at 75 gallons a minute. The daily application of copper sulphate to the Lancaster sand filter effluent, with its flow of 160,000 gallons a day, would require 17.3 lb. of copper sulphate, and the cost of this chemical would be about $1.04 (4*s.* 2*d.*) a day. The cost of constructing the Lancaster plant used in these experiments, and capable of treating the whole daily flow of 160,000 gallons, was $29 (5*l.* 16*s.*). An estimate is given of the cost of a plant under practical conditions for continuous treatment of this flow as $92 (18*l.* 8*s.*). The maintenance cost per annum would be $379.5 (75*l.* 18*s.*) for copper sulphate at 6 cents (3*d.*) a pound, labour (365 days) at $2 (8*s.*) a day, equals $730 (146*l.*), total $1,109.5 (221*l.* 9*s.*); capitalised at 5 per cent. this would represent an investment of $22,000 (4,400*l.*).

The sewage disposal plant at Marion, Ohio, is a combination of septic tanks, contact filters and sand filters, dealing with about 600,000 gallons of sewage daily. To provide a storage reservoir for the copper sulphate treated sewage a dam was built in the effluent sewer, about 900 feet west of the disposal plant, and a coffer dam, composed of 6-inch sheathing, was constructed at the outlet of the effluent sewer in the creek into which it discharges. The exposed height of the sheathing was such that in all but extreme flood stages the effluent would discharge into the creek in a clear stream. The object of protecting the outlet of the effluent sewer was to prevent the sterilised sewage from becoming contaminated by the water in the creek, which, as it probably contained considerable quantities of domestic sewage, would have spoilt the tests. The storage or contact period of sewage effluent and copper sulphate was about one hour. The copper sulphate solution prepared in a solution tank of about 1,780 gallons capacity was discharged at the rate of two gallons a minute. The application of copper sulphate to the Marion sand filter effluent with a daily flow of 600,000 gallons, on a basis of applying 20 parts of copper sulphate to each 1,000,000 gallons of the effluent, would cost $6 (1*l.* 4*s.*) a day for chemicals, and the cost of constructing a plant for applying the copper sulphate would be about $151 (30*l.* 4*s.*). The cost of treatment annually, using copper sulphate, would be about $2,920 (584*l.*); of this labour would be $730 (146*l.*), and chemicals $2,190 (438*l.*). Capitalised at 5 per cent. this would represent an investment of $58,000 (11,600*l.*).

(To be concluded.)

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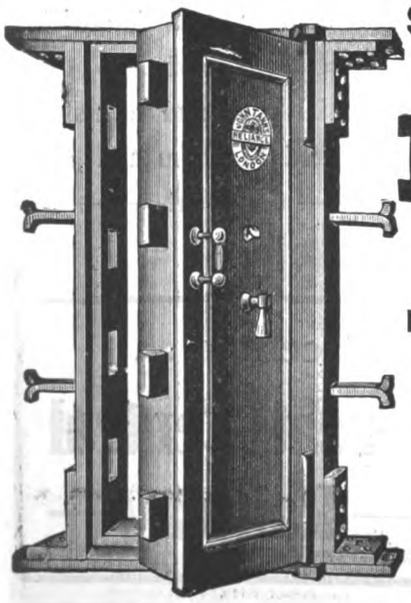
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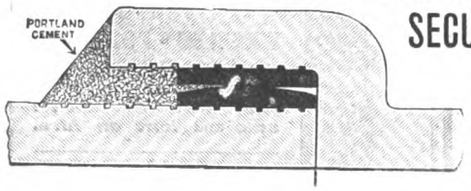
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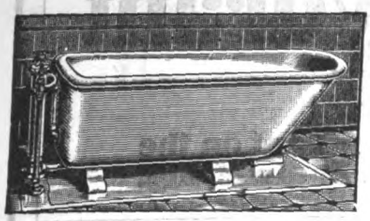
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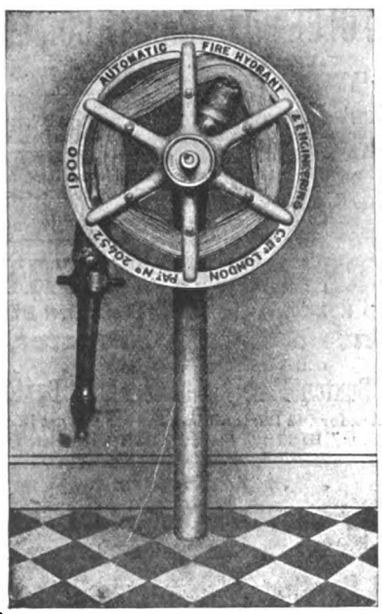
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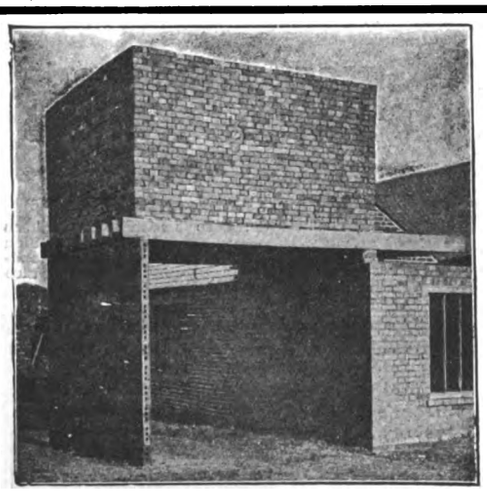
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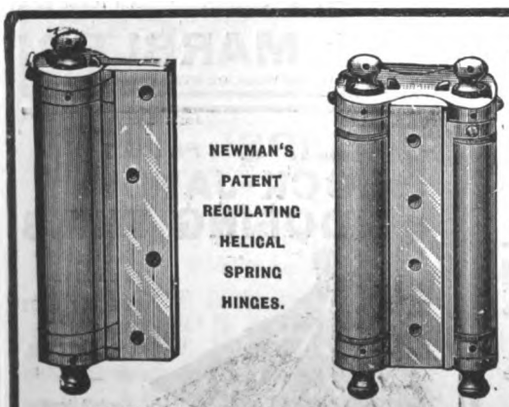
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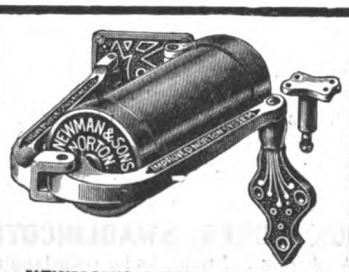
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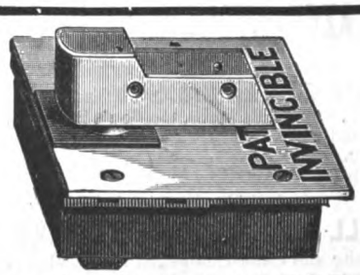


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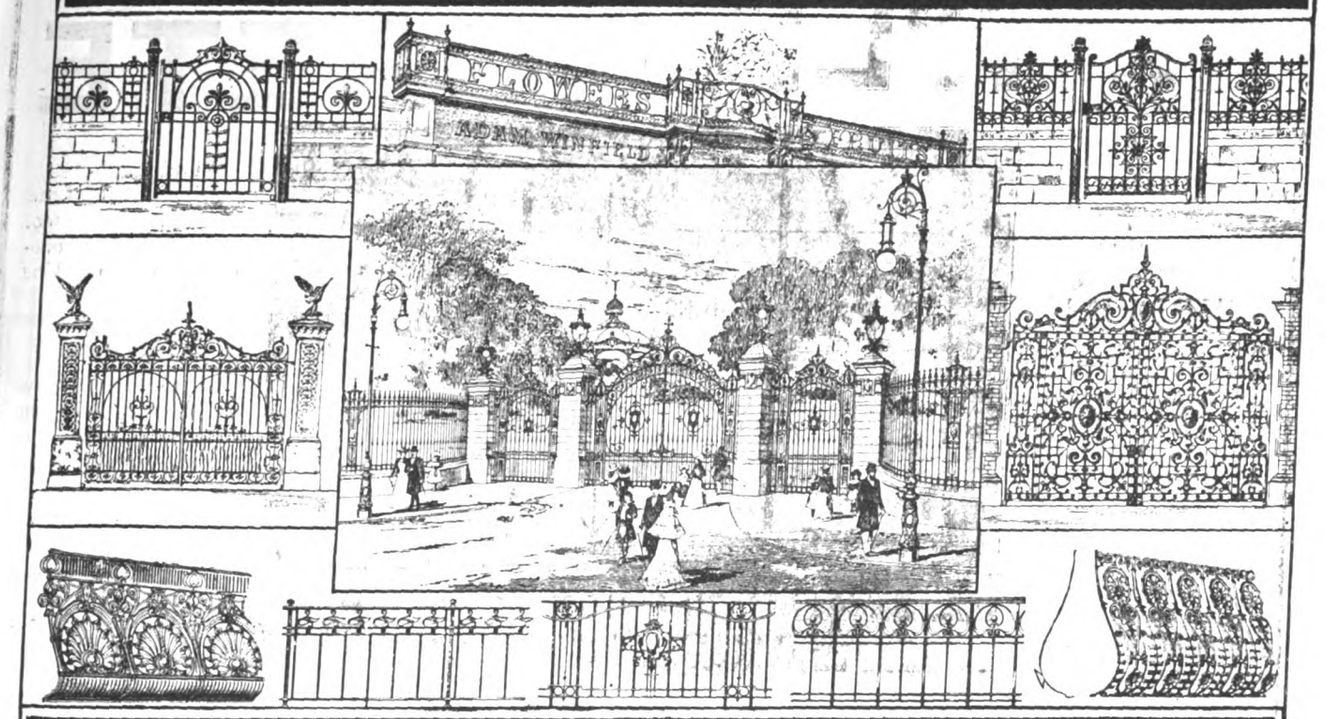


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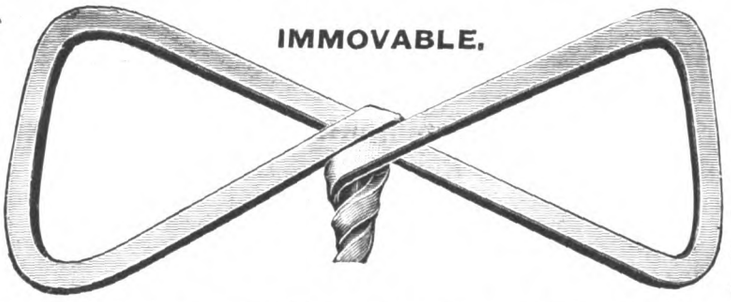
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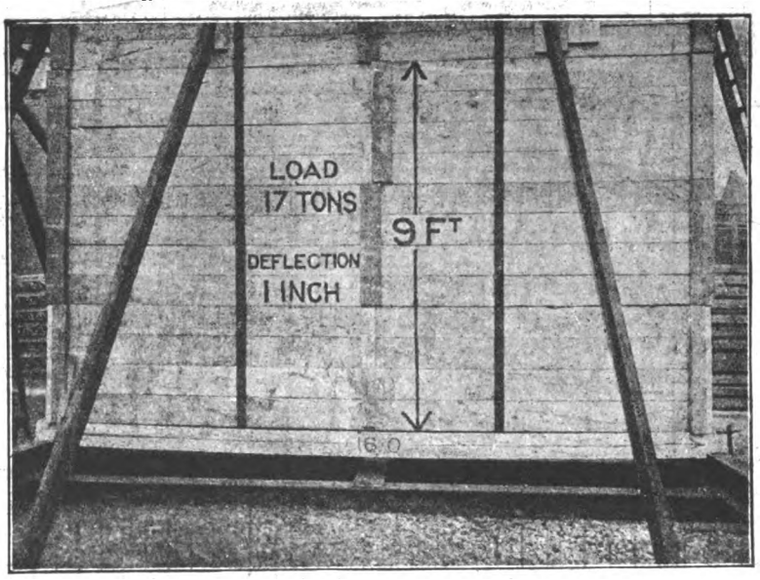
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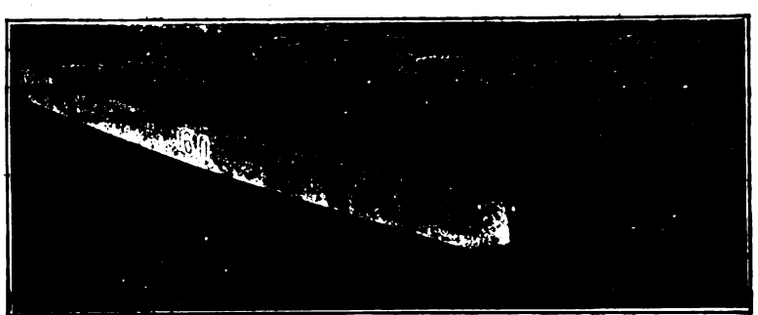
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(63)

Divide by the span in feet and by the working load in cwts. to find the Spacing in Feet.

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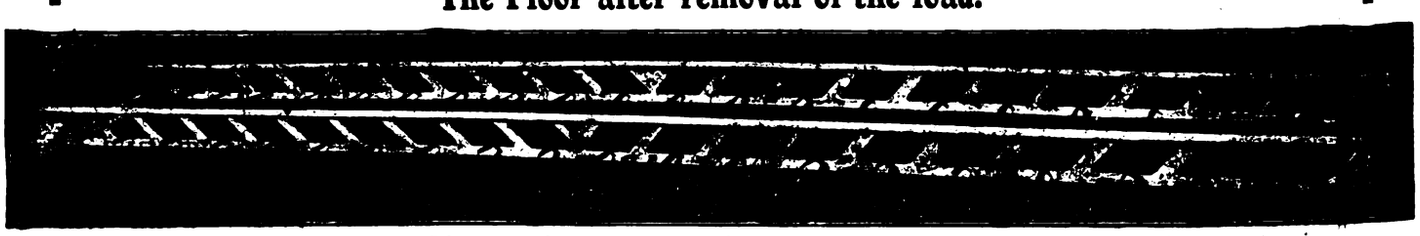
Span 15 Feet.

Load 1½ cwts. per foot.

15)63·0(4·2
60
30
30

1·5)4·2(2·8
30
120
120

Or about 2′ 9″ to 2′ 10″ Centres.



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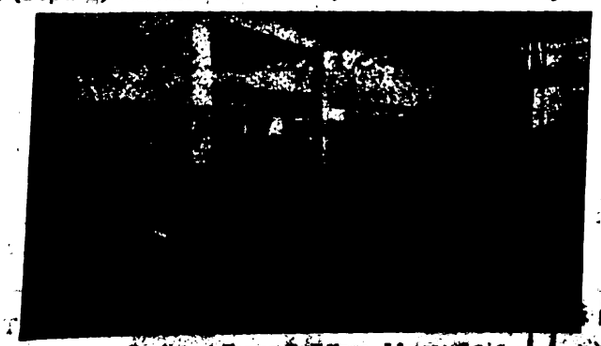
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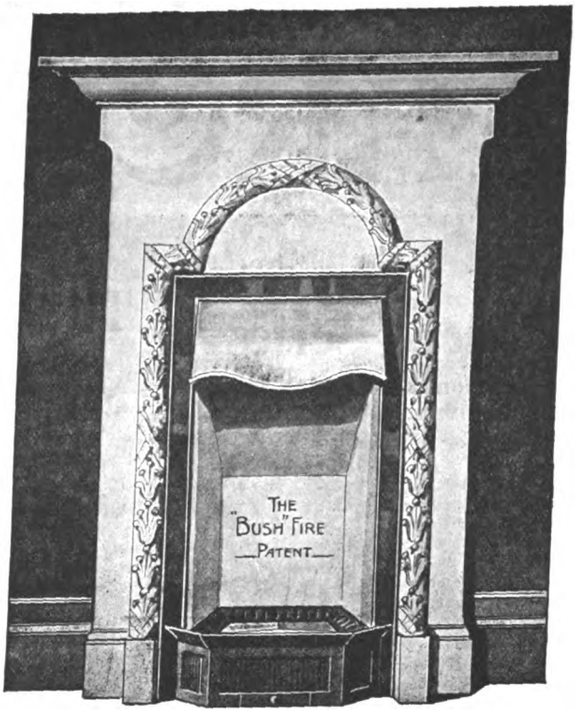
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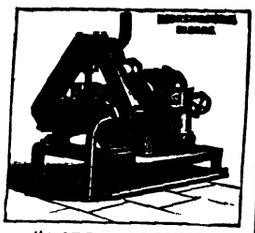
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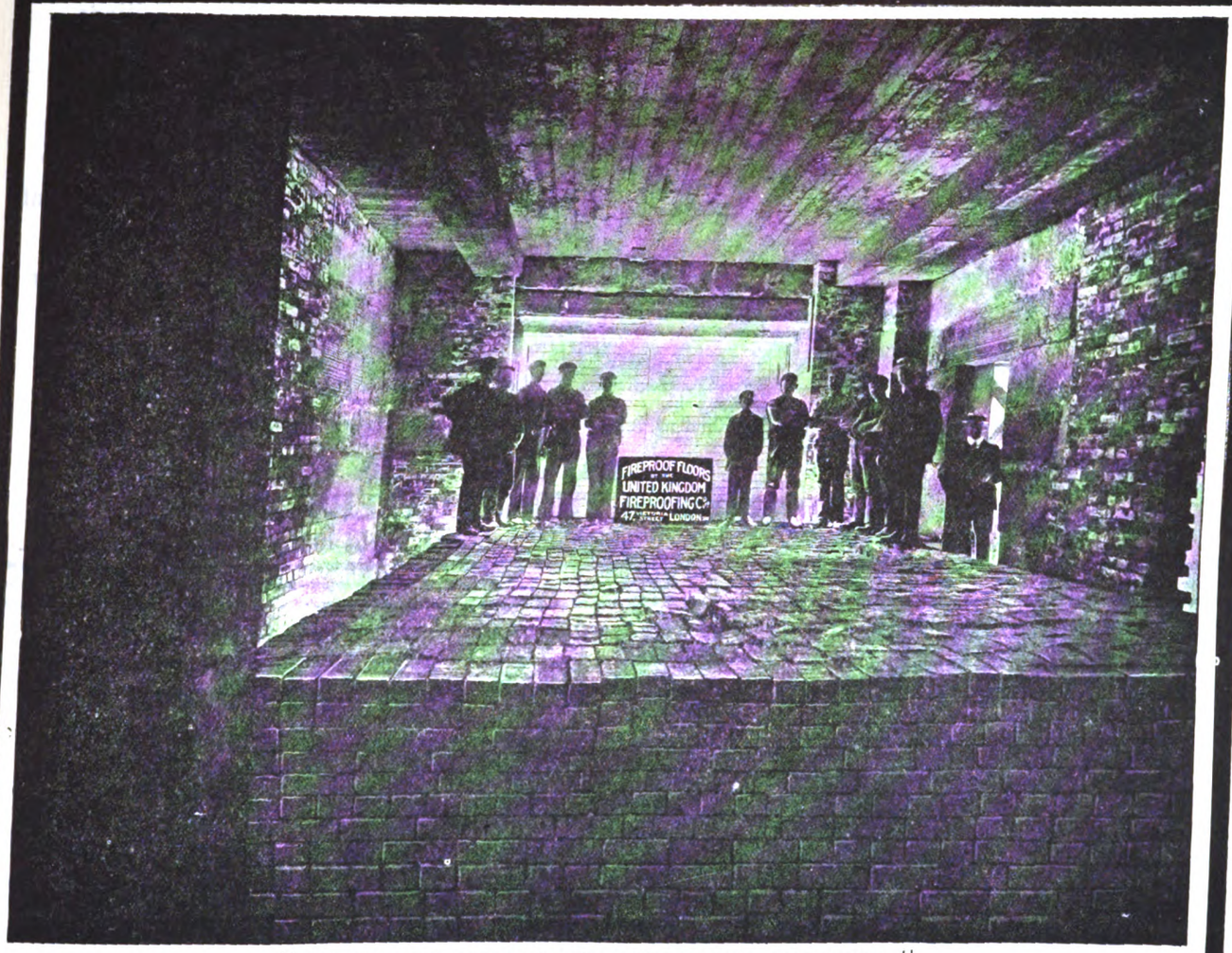
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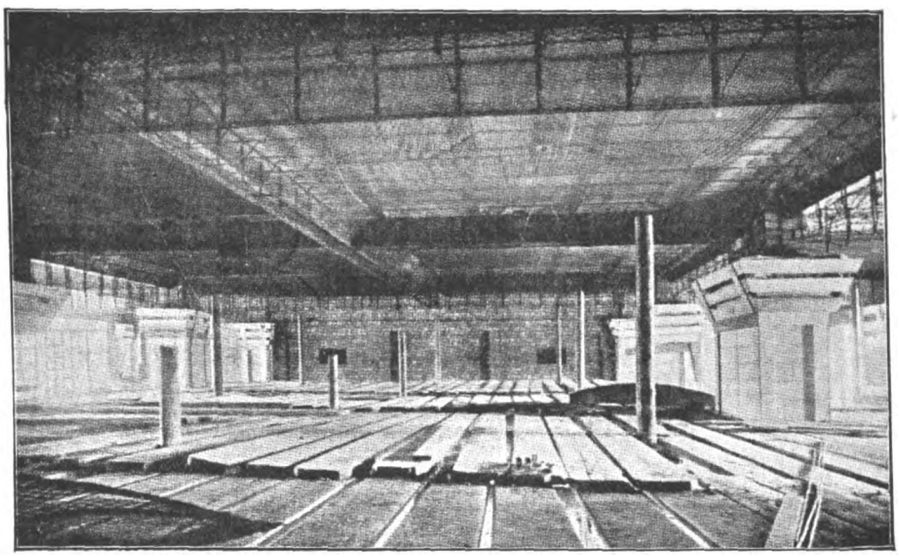
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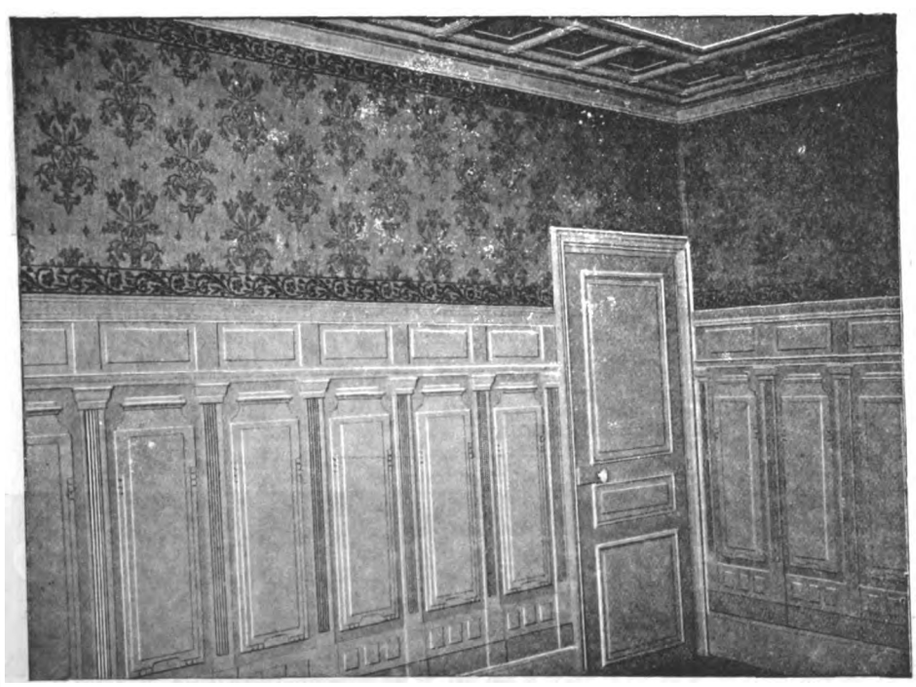
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EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

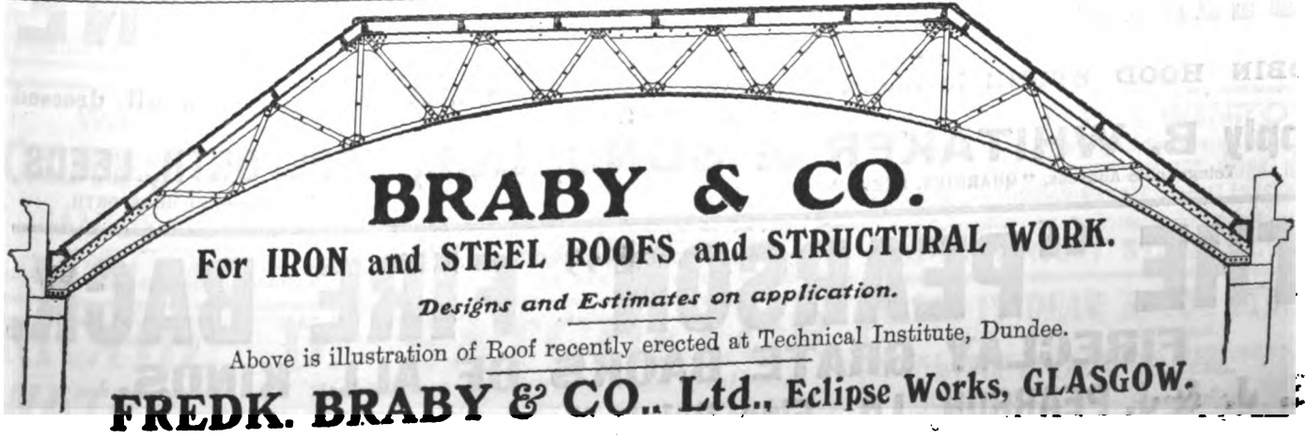
HULL.—Oct. 18.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

PRESTON.—Nov. 1.—The Corporation invite designs for a boys' grammar school. Premiums of 50*l.*, 30*l.* and 20*l.* Mr. Alfred Howarth, town clerk, Town Hall, Preston.

WALES.—Oct. 1.—The Urban District Council of Aberdare invite competitive designs for a fever hospital for fifty-two patients, including administrative block, outbuildings, &c. Premiums of 100*l.*, 50*l.* and 25*l.* An assessor will be appointed on the nomination of the President of the R.I.B.A. Deposit 3*l.* 3*s.* Mr. T. Phillips, clerk, Town Hall, Aberdare.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

WARRINGTON.—The Warrington education committee invite competitive plans for the erection of a public elementary school. Deposit 1*l.* 1*s.* Mr. J. Moore Murray, secretary and director, Education Offices, Sankey Street, Warrington.



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BIRMINGHAM.—Sept. 13.—For erection of a matron's house at the infirmary, Dudley Road. Mr. W. H. Ward, Paradise Street, Birmingham.

BLACKPOOL.—Sept. 22.—For the erection of central library and art gallery. Deposit 2*l.* 2*s.* Mr. T. Loftos, town clerk, Blackpool.

BRISTOL.—Sept. 21.—For builder's, plumber's and electrician's work (separate tenders) connected with the erection of a Council school at Alexandra Park, Fishponds. Deposit 2*l.* 2*s.* Messrs. Rodway & Dening, architects, Gaunt House, Orchard Street, Bristol.

BROOMHILL.—Sept. 13.—For additions and alterations to manager's house, for the Togston Terrace Co-operative Society, Broomhill, Northumberland. Mr. H. Watson, secretary, Coronation Terrace, Broomhill.

BURY.—Sept. 20.—For the rebuilding of the fronts of shops, Nos. 60, 62 and 64 Bolton Street. Mr. Arthur W. Bradley, A.M.I.C.E., borough engineer and surveyor, Bank Street, Bury.

CAMBRIDGE.—Sept. 20.—For erection of additions to the sewage pumping station, Riverside. The Borough Surveyor, Guildhall, Cambridge.

COSTON.—Sept. 14.—For the construction of a brick bridge and other works connected therewith over the Ford. Mr. Arthur H. Marsh, clerk, Bank Chambers, Melton Mowbray.

DONCASTER.—Sept. 13.—For the erection of the Municipal High School for Girls, to provide accommodation for 300 pupils. Send names to Messrs. J. M. Bottomley, Sons & Wellburn, architects, 13 Bond Street, Leeds, and 28 Albert Road, Middlesbrough.

EDINBURGH.—Sept. 16.—For the erection of laboratory buildings, Royal Botanic Garden, Edinburgh. Deposit 1*l.* 1*s.* His Majesty's Office of Works, Parliament Square, Edinburgh.

HARESTOCK.—For the erection of six cottages at Harestock, near Winchester. Messrs. Meakin, Archer & Stoneham, architects, 32 Nicholas Lane, London, E.C.

HENLEY-ON-THAMES.—Sept. 20.—For additions and alterations to the engine and boiler house at the Lambridge Power Station, including boiler and engine foundations and setting for economiser. Mr. E. F. Pratt, borough surveyor, Henley.

HOLY ISLAND.—Sept. 20.—For the construction of a timber and corrugated steel lifeboat house and timber slip at "The Snook," Holy Island, Northumberland, for the committee of management of the Royal National Lifeboat Institution. Deposit 1*l.* Mr. W. T. Douglass, M.I.C.E., engineer and architect to the Royal National Lifeboat Institution, 15 Victoria Street, Westminster, London, S.E.

ILFRACOMBE.—Sept. 22.—For erection of business premises, The Promenade. Mr. Allen T. Hussell, F.R.I.B.A., Market Square, Ilfracombe.

IRELAND.—Sept. 22.—For enlarging and remodelling the Church of Our Lady of the Immaculate Conception, Newcastle, co. Down. Mr. J. J. M'Donnell, architect, 27 Chichester Street, Belfast.

IRELAND.—Sept. 27.—The Secretary of State for War invites tenders for the following work:—Erection of twelve "A" married soldiers' quarters, Fermoy, Ireland. Deposit 10*s.* 6*d.* Send names by September 17 to the Director of Barrack Construction, 80 Pall Mall, London, S.W., or to the Barrack Construction Office, Fermoy, Ireland.

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LEEDS.—Sept. 23.—For any of the trades required in the erection of boys' and girls' departments at the Kirkstall Road Council school. The Education Department (architect's section), Calverley Street, Leeds.

LIGHTCLIFFE.—Sept. 18.—For the several works required in connection with the erection of two lodges and appurtenances, also motor garage. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

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LONDON.—Sept. 29.—For the erection of a public convenience in Avenue Gardens, Station Road, Wood Green, N. Deposit 1*l.* 1*s.* The Surveyor, Town Hall, Wood Green.

MAIDSTONE.—Sept. 23.—For the erection of an isolation hospital adjacent to Well Street. Deposit 1*l.* 1*s.* Messrs. Ruck & Smith, architects, 86 Week Street, Maidstone.

NEWCASTLE-UPON-TYNE.—Sept. 15.—For erection of a block of offices in Westgate Road, for the North Eastern Railway Company. Mr. William Bell, the company's architect, Central Station, Newcastle-upon-Tyne.

PHILLEIGH.—Sept. 18.—For erection of a wain-house and alterations at Tolverne Farm, in the parish of Philleigh, Cornwall. Mr. George Gow, Tregothnan Office, Truro.

ST. ANNE'S-ON-SEA.—Sept. 23.—For the erection of an elementary school to accommodate 310 scholars, for the Lancashire education committee. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

SCOTLAND.—Sept. 15.—For the mason, carpenter, plumber, slater, plasterer and painter works of the following:—(1) Additions to the public school, including a science room at Tomintoul; (2) cooking and laundry department at St. Michael's, Tomintoul. Mr. John Wittet, architect, Elgin.

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STANHOPE.—Sept. 20.—For erection of three stone bridges on the new road from Eastgate to Rookhope, for the Weardale Rural District Council. Deposit 1*l.* Mr. G. W. Eggleston, highway surveyor, Board Room, Stanhope.

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WALES.—Sept. 16.—For the erection of Union offices in Holly Street, Pontardawe. Deposit 2*l.* Mr. Arthur M. Leon, architect, Working Street, Cardiff.

WALES.—Sept. 15.—For the erection of a pavilion at Pontypridd. Mr. Arthur L. L. Thomas, architect and surveyor, Church Street Chambers, Pontypridd.

WALES.—Sept. 15.—For the erection of twenty-eight cottages at Bargoed. Mr. Idris Leyshon, architect and surveyor, Hanbury Road, Bargoed.

WALES.—Sept. 16.—For the extension of the Abertillery central girls' school. Deposit 1*l.* 1*s.* Mr. W. H. Hiley, architect, Chapel Street, Abertillery.

WALES.—Sept. 18.—For erection of a county hall in the Cathays Park, Cardiff, upon foundations which have already been laid. Deposit 2*l.* 2*s.* Messrs. Harris & Moodie, archi-

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tects, 8 New Square, Lincoln's Inn, London, W.C., and at the County Council Offices, Westgate Street, Cardiff.

WALES.—Sept. 20.—For erection of fourteen brick-built houses at Prendergast. The Borough Surveyor's Office, Council Chambers, Haverfordwest.

WALES.—Sept. 23.—For the erection of an electric power station on the eastern side of the Prince of Wales Dock Lock, for the Swansea Harbour Trustees. Mr. A. O. Schenk, M.I.C.E., Harbour Offices, Swansea.

WHEATLEY HILL.—For the erection and completion of a miners' hall at Wheatley Hill, Durham. Mr. James Garry, F.R.I.B.A., 47 Church Street, West Hartlepool.

WINCHESTER.—Sept. 11.—For alterations at No. 11 Southgate Street. Mr. J. Ashton Sawyer, chartered surveyor, Winchester.

WINGATE, &c. (DURHAM).—Sept. 21.—(1) For erection of Wingate school (300 scholars). Mr. W. Rushworth, Shire Hall, Durham. (2) For erection of Cold Hesledon school (264 scholars). Mr. J. W. F. Phillipson, Murton Chambers, 8 Grainger Street, Newcastle-on-Tyne. (3) For alterations and additions to Dean Bank school. Mr. T. W. T. Richardson, 57 High Street, Stockton-on-Tees. (4) For alterations and additions to New Penshaw and Westwood Council schools (plans, specifications and general conditions only). Mr. F. E. Coates, Shire Hall, Durham.

WREXHAM.—Sept. 15.—For constructing a stairway at the workhouse, to be used as an alternative exit in case of fire. Mr. J. Price Evans, Argyle Chambers, Wrexham.

WHEN the London County Council resumes its sittings a proposal will be brought forward to proceed with the erection of a secondary school at Hilly Fields, Brockley. The education committee has already had preliminary plans of the buildings, the estimated cost being 20,670*l*. Accommodation is to be provided for 460 scholars. It is also expected the asylums engineer, who recently visited Germany in connection with the preparation of plans for a proposed mental hospital, will report progress. Notice has been given of the intention of the L.C.C. to erect an elementary school at Tooting for 800 children.

TENDERS.

ALDERSHOT.

For making up Holly Road. Mr. F. C. UREN, A.M.I.C.E., surveyor.

Ball & Co.	£2,768 2 7
Fulford & Crow	2,633 13 0
Wilcox	2,574 13 2
Trueman	2,519 16 6
Wheeler & Co.	2,388 19 0
Starkey	2,379 0 8
Wells & Co.	2,106 10 8
Franks	2,089 6 6
Kemp & Co.	2,034 0 0
Ripley, Strong & Co.	2,018 9 8
NORRIS, Upper Hale (*accepted*)	1,990 7 6
Surveyor's estimate	2,518 3 11

AYLESBURY.

For erecting stables, stores, sheds, &c., for the Urban District Council. Mr. W. H. TAYLOR, Council surveyor.

Fryd	£2,187 0 0
Green & Co.	2,143 10 0
Moseley	1,925 0 0
Bosworth & Lowe	1,922 15 0
Mayne & Son	1,898 0 0
Stone	1,830 0 0
Jewell & Sons	1,796 15 6
Honour & Sons	1,749 0 0
Gibson & Sons	1,747 0 0
Locke	1,687 0 0
WEBSTER & CANNON, Aylesbury (*accepted*)	1,668 0 0
Crook & Judd	1,647 12 6
W. & D. Wilkins	1,645 0 0

BRIERLEY HILL.

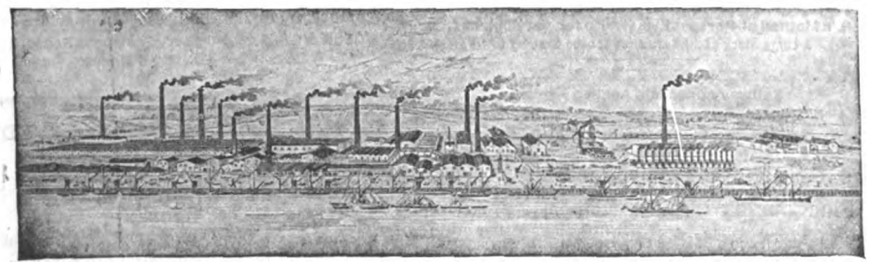
For carrying out the Council's sewerage scheme.

Moss & Co., Loughborough (*accepted*) . £13,870 0 0

(Twenty-four tenders were received.)

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DEVONPORT.

For interior decoration of St. John the Baptist Church. Mr. EDGAR M. LEEST, architect, Devonport.

Prowse	£363 0 0
Horris & Sons	289 10 0
Earl & Son	224 15 0
PITCHET & SON, Devonport (*accepted*)	204 17 0
Osborne	192 19 6

DARLINGTON.

For erecting a villa in Cleveland Avenue. Messrs. J. P. PRITCHETT & SON, architects, Darlington.

Accepted tenders.

Johnson, Darlington, brick, plasterer and joiner	£645 7 2
Smith, Darlington, plumber	100 5 0
Lancaster Bros., Darlington, slating and tiling	90 4 10
Lauson & Stobbart, Darlington, electric lighting and bells	20 7 9
Hoskins & Co., Darlington, painting	17 7 0

FAREHAM.

For erection of a house at Fareham. Messrs. HALL, PAIN & GOLDSMITH, architects, Fareham, Hants.

Scammell	£1,581 0 0
Chance & Sons	1,422 7 0
Wright	1,408 16 4
Hunt	1,406 0 0
Dugan	1,378 6 6
Lane	1,338 0 0
Privett	1,305 0 0
Buckett	1,300 0 0
Willcox	1,285 0 0
Latty	1,250 0 0
Plummer	1,250 0 0
Glover & Son	1,246 0 0
DRAPER, Fareham (*accepted*)	1,209 0 0
Fry	989 0 0

HALSTEAD.

For erecting an elementary school to accommodate 420 children, for Essex education committee (Halstead district sub-committee). Messrs. GOODEY & CRESSALL, architects, Colchester.

Suckling	£6,482 0 0
Saunders	5,910 0 0
Dowsing & Davies	5,500 0 0
Grimwood & Sons	5,497 0 0
Rogers	5,284 0 0
Bell & Sons	5,216 0 0
Shanks	5,175 0 0
Theobald	5,115 0 0
F. & A. Willmott	5,091 0 0
Kenny	5,085 0 0
Hammond & Sons	5,081 0 0
Farr	5,068 0 0
Parkington & Son	5,000 0 0
Kerridge & Shaw	4,998 0 0
Smith	4,997 0 0
Linzell	4,997 0 0
Sharp	4,988 0 0
Everitt & Son	4,978 0 0
Dobson & Son	4,958 0 0
Clark & Sons	4,945 0 0
Fryd	4,857 0 0
Spencer, Santo & Co.	4,750 0 0
Pudney & Son	4,728 0 0
Mason & Son	4,675 0 0
Potter & Son, Chelmsford (*recommended*)	4,647 0 0

KETTON.

For lych-gate, &c. Messrs. TRAYLEN & SON, architects and surveyors, Stamford.

Bowman & Sons	£301 10 0
Thompson & Co.	296 0 0
Bell & Sons	261 0 0
Hilliam	259 14 0
Rudd & Son	256 10 0
Halliday	237 6 0
Woolston	237 0 0
Willmott & Sons	235 0 0
HIBBINS, Ketton (*accepted*)	233 0 0

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MILLHAMS FORD.

For building brick bridge at Millhams Ford, Dorset, for Poole Rural District Council. Mr. R. T. S. SEYMOUR, surveyor, Wimborne.

Elcock	£580 10 0
LAWFORD, Upper Parkstone (*accepted*)	431 2 3

OSWESTRY.

For the construction of open settling-tanks, detritus tanks, storm-water tanks, percolating filters, effluent outfall and other sewers, preparation of land and other works in connection with the sewage disposal of the borough. Mr. G. WILLIAM LACEY, M.I.C.M.E., borough engineer and surveyor.

Wright & Co.	£8,817 8 1
Hutton & Co.	8,420 0 0
Jones	6,800 0 0
Trentham	6,781 13 11
Williams	6,780 10 0
Jowett Bros.	6,768 12 2
Brebner & Co.	6,317 6 1
Woodland	6,185 14 4
Cottle	5,855 19 8
Underwood & Bro.	5,804 19 1
Bell & Sons	5,749 0 0
Taylor & Son	5,679 11 0
Morley & Sons	5,553 4 10
Johnson Bros.	5,529 0 0
Hill & Co.	5,447 12 0
Cunliffe & Sons	5,248 0 0
THOMAS, Oswestry (*accepted*)	5,150 0 0

NORFOLK.

For the erection of Soham Toney Hall, Norfolk. Mr. H. J. GREEN, A.R.I.B.A., architect, Norwich and King's Lynn.

Thompson & Co.	£10,122 15 5
Riches	9,425 0 0
Cubitt & Gotts	8,795 0 5
Youngs & Son	8,247 0 0
Shanks	8,054 0 0
CRACKNELL, Peterborough (*accepted conditionally*)	7,964 0 0

SOUTHEND-ON-SEA.

For erecting Bournemouth Park Road Council school. Mr. P. BROCKBANK, architect, Southend-on-Sea.

Leaney	£6,550 0 0
Houghton	6,389 0 0
Ballard & Co.	6,199 0 0
Flaxman	5,997 0 0
Woodhams	5,899 0 0
A. R. Whur	5,897 0 0
F. & E. Davey	5,877 0 0
E. & B. H. Davey	5,832 0 0
F. Davey	5,543 0 0
Moss & Co.	5,447 8 9
Brown Bros.	5,397 0 0
Hammond & Son.	5,358 0 0
F. E. Whur	5,354 0 0
W. E. Davey	5,321 0 0
GRAINGER, Southend (*accepted*)	5,184 10 0

For alterations and additions to the boys' and girls' departments of the Southchurch Hall Council school. Messrs. BURLES & HARRIS, architects, Clarence Street.

Grainger	£765 0 0
Wilkinson	713 0 0
Whur	680 0 0
F. Davey	644 0 0
F. & E. Davey	640 0 0
Moss & Co.	620 0 0
FLAXMAN, Southend (*accepted*)	600 0 0

STEVENAGE.

For the construction of a brick and concrete covered service reservoir of 300,000 gallons capacity, and valve chambers, with inlet, outlet and washout pipes and valves, at the waterworks, near Stevenage, Herts, for the Stevenage Urban District Council.

Spratt	£2,595 0 0
Smith & Co.	2,303 4 1
Edwards & Co.	2,298 5 3
Wallace & Inns	2,274 16 7
Brummell	2,254 17 3
Lown & Co.	2,242 14 10
Davies	2,201 14 4

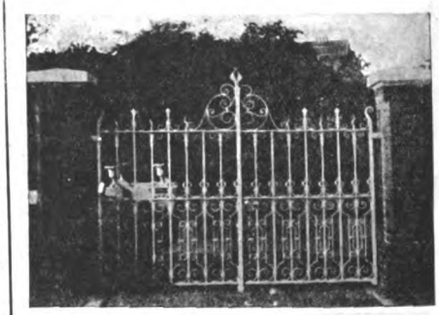
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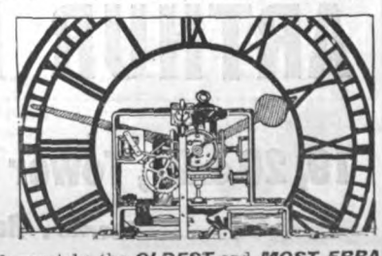
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STEVENAGE—*continued.*

Jewell	2,184 8 0
Wilkinson & Co.	2,159 0 0
Brebner & Co.	2,120 0 0
Dean & Perkins	2,097 17 6
Paul	2,097 0 0
Rowell & Sons	2,081 8 6
Shrouder & Matthews	2,062 0 0
French	2,056 19 6
Bell & Sons	1,893 0 0
Farr	1,860 0 0
WILLMOTT & SONS, Hitchin (*accepted*)	1,830 0 0
Ekins & Co.	1,813 0 0

TAUNTON.

For rebuilding the King's Arms, North Town. Mr. G. C. STRAWBRIDGE, architect, Taunton.

Gleed Bros.	£1,279 0 0
Henderson	1,191 9 8
Way	995 5 0
Small	933 0 0
Vickery Bros.	849 17 6
Moggridge & Sons	849 15 0
MADDOCK, Taunton (*accepted*)	849 0 0

TROWBRIDGE.

For erection of a weights and measures office in Hill Street. Mr. J. GEORGE POWELL, county surveyor.

Tydeman Bros.	£300 0 0
Beazley	275 0 0
Billett & Musslewhite	264 15 0
Button	254 0 0
Preece	200 0 0
Ash	198 18 0
Moore	195 10 0
Linzey	192 10 0
ISLEY & Co., Trowbridge (*accepted*)	189 10 0

WALES.

For the erection of a stable and cart shed at Beaufort and a bandstand at Ebbw Vale. Mr. T. J. THOMAS, town engineer and surveyor.

Bandstand.

Boulton & Paul	£235 0 0
Ebbw Valley Building Co.	225 0 0
Davies & Son	187 0 0
BEVAN, Beaufort (*accepted*)	158 0 0

Stable and Cart Shed

Fudge	198 12 0
BEVAN, Beaufort (*accepted*)	198 0 0

For building a 9-foot boundary wall round the workhouse property, Llanelly.

D. Jenkins	£832 0 0
Mercer	775 0 0
Morgan	750 0 0
Williams	736 0 0
Hughes	709 0 0
J. A. JENKINS, Llanelly (*accepted*)	595 0 0

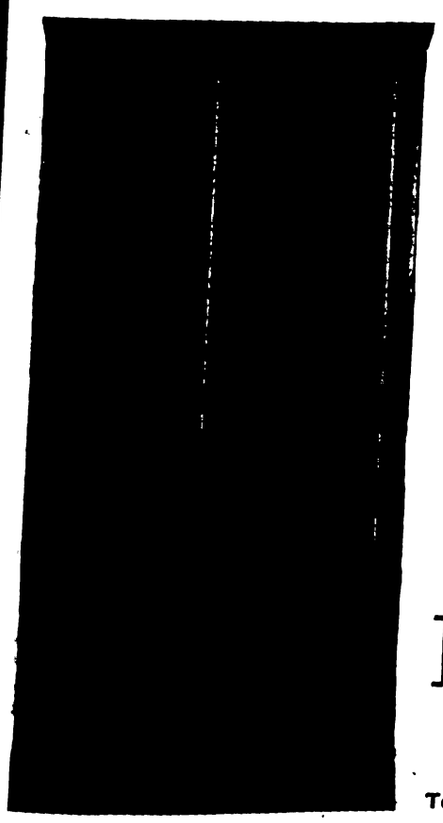
For additions and alterations to reservoir, Llanfrechfa, for the Urban District Council.

Parfitt	£10,490 0 0
Brebner & Co.	6,918 16 0
Collins & Co.	6,703 6 8
Johnson Bros.	6,612 5 3
Callender & Co.	6,291 5 6
Barnes, Chaplin & Co.	6,201 12 4
Smith	5,892 7 0
MCNAB, Newport (*accepted*)	5,113 18 9

For erection of a caretaker's house in connection with the Public Library, Penarth. Mr. H. SNELL, architect, Penarth.

Hallett	£560 0 0
Shepton & Son	530 0 0
Bowers & Co.	526 0 0
Maggs & Co.	522 0 0
Hooper	455 0 0
Humphries	438 0 0

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WANSTEAD.

For proposed receiving homes at Wanstead, for the West Ham Board of Guardians.

Fitch & Cox	£28,321	0	0
Harris & Wardrop	25,693	0	0
Wall	24,959	0	0
Allen & Son	24,934	0	0
Myall & Upson	24,493	0	0
Webster & Son	24,321	0	0
Coles	23,818	0	0
Pattinson & Sons	23,311	0	0
F. & G. Foster	23,250	0	0
Kirk & Randall	23,224	0	0
Nightingale	23,075	0	0
Gathercole Bros.	23,000	0	0
Maddison	22,579	0	0
Brand, Pettit & Co.	22,400	0	0
F. & A. Willmott	22,063	0	0
Spencer, Santo & Co.	21,998	0	0
F. & H. F. Higgs	21,614	0	0
Jerram	21,349	0	0
Coxhead	21,115	0	0
SYMES, Stratford (*accepted*)	20,919	0	0
Carter	20,646	0	0

TRADE NOTES.

A LARGE clock has been erected in the parish church, Blackwell, near Alfreton, which chimes the quarters, strikes the hours, and shows time on three large dials. The work has been carried out by John Smith & Sons, Midland Clock Works, Derby.

MESSRS. OETZMANN & Co., LTD., Hampstead Road, W., supplied the furniture for the new play "Madame X," which was produced for the first time last week at the Globe Theatre, Shaftesbury Avenue. The scenes, which include a room in an hotel, a court of assize, and two different studies, are all in France, and offer scope for varied treatment.

THE Carron Company have just executed an important order for fire-grates for the Ameer of Afghanistan's new palace in course of erection at Cabul. These firegrates—twenty-two in number—are fitted with dogs to harmonise, together with heavy canopies of various designs, the whole being of a very high-class character. The designs, which have been approved by the Ameer, are essentially Oriental in style, presenting a very striking and handsome appearance, while on the brass work, of which the firegrates are almost wholly composed, much hand labour has been involved. A special feature of these fire-grates is the unusually large fire, on the assumption that wood will be burned as fuel. The grates are chaste in design, and are elaborate and beautiful examples of the ironfounder's art.

THIS week a demonstration was given by Messrs. Spagnoletti, Ltd., of Goldhawk Road, W., of their new electric water-heater "Therol." The apparatus may be described as a block of iron (continuously heated from within by electricity) cast about a coil of pipe through which water is passed when desired. It is encased in a thick coat of insulating material, which is in turn surrounded by the circular water tank, likewise well lagged. The main principle is that continuous electricity is thus accumulated and stored until required for heating the water. The initial cost of a No. 1 Therol electric heater (sufficient for the needs of a small household), having an average consumption of 200 watts and heating about 30 gallons a day, is fifteen guineas. The electricity used to raise the temperature of 25 gallons of water up to 110° F.—*i.e.* the temperature of a very hot bath—or to produce 9 gallons of boiling water, is estimated to cost about 1*l.* 2*s.* 6*d.* per quarter at .61*d.* per unit. This figure of .61*d.* per unit is that resulting from the ½*d.* per unit, plus 1*l.* per kilowatt per quarter, quoted by a number of stations when the power is taken continuously throughout the day and night—that is to say, for consumers with a 100 per cent. load factor. The manufacturers make out a strong case as to the wisdom of the electric supply authorities making an arrangement with purchasers of the "Therol" water-heater for the supply of current at the above rate. On their agreement the success of the invention seems to depend. The apparatus is self-contained and involves small alteration to existing pipes. It occupies little space, obviates the risk of fire, does not contaminate the air, and requires no attention whatever. The hot water is always available the instant the tap is turned, and may be drawn off at any desired temperature from quite cold to boiling.

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BUILDING AND BUILDERS.

THE Bury Town Council are about to apply to the Local Government for permission to borrow 11,000*l.* for its housing scheme.

THE congregation of Dumfries Free Church, N.B., have decided to erect a church in George Street, at a cost of 1,100*l.* The congregation have 1,000*l.* in hand.

THE Scarborough Corporation have approved in committee a plan for the construction of a shelter, at a cost of 650*l.*, on the Marine Drive, and the construction of a terrace, adjoining the shelter, at a cost of 258*l.*

THE India Rubber, Gutta Percha and Telegraph Works Company, Ltd., Silvertown Works, West Ham, are contemplating the erection of an additional factory in the country. A site may be selected in the Midlands.

THE Johannesburg Town Council have decided to build a town hall at a cost of 125,000*l.* The building is to include galleries, and seating accommodation for 2,000 persons, organ loft, Council chamber, &c.

THE Alexandra Park Property Company, 65 Bath Street, Glasgow, have been authorised by the Dean of Guild Court to erect five tenements of dwelling houses in Aberfeldy and Walter Streets, and a new street off Cumbernauld Road, Glasgow.

AT a meeting of the Falkirk Dean of Guild Court, Jack W. Morris, The Tower, Portobello, was granted warrant to make alterations on the premises at Springfield, formerly occupied by the Diamond Foundry Company, and to form them into a roller skating rink, with platform, cloak-rooms, and other conveniences.

NEW sewage-disposal works are to be constructed at Oswestry immediately, at a cost of 6,000*l.* A committee of the Town Council has also been appointed to take steps to convert Caeglas, recently acquired at the cost of 6,000*l.*, into a public park.

THE following plans were last week approved by the Spennymoor Council:—Two shops and parish hall in High Street, for trustees of National Schools; four houses and shop in High Grange Road, for Mr. W. S. Gill; extension to mineral water factory in Armoury Street, for Mr. J. Pickering.

MESSRS. EASTON GIBB & SON have decided to erect a private central power station for the distribution of electric light and power throughout the entire works at Rosyth naval base. The National Gas Engine Company, Ltd., Ashton-under-Lyne, have received the order for the installation of four gas engines and suction gas plants.

NEW offices are to be erected for the health and cleansing departments of Blackpool Corporation. At the last meeting of the general purposes committee plans were submitted estimated to cost 3,500*l.* These were referred back for the purpose of the borough surveyor preparing a more ornate design at an additional cost of 1,000*l.*

THE County Council of Durham give notice of their intention to erect elementary schools at Easington Colliery (1,700 scholars), Seaham Harbour (480 children), New Seaham (450 children), Close House, Coundon Grange (500 children), and at Shiney Row, Penshaw (800 children). It is proposed to enlarge the Council school at Newbottle by providing additional accommodation for about 300 children.

THE new sewage disposal works which were opened at Burslem in September last, and in which an outlay of about 40,000*l.* was involved, have not proved the anticipated success owing to the failure of the septic tanks. The manager asked for 11,936*l.* to carry out the necessary alterations. Last week, after a long discussion the Town Council agreed to expend 6,500*l.* on the work.

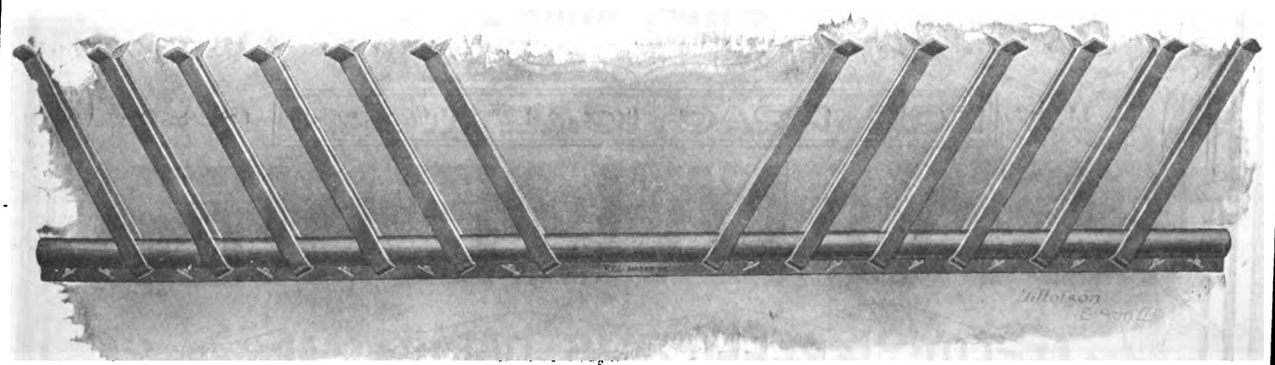
THE War Office have placed with the Cleveland Bridge and Engineering Company, Ltd., of Darlington, a contract for the construction of a large building of all-steel construction for housing dirigible balloons at Cove Common, South Farnborough. Designs were invited from four leading British structural engineering firms. The building will be at the disposal of the military authorities twenty weeks from date.

THE general purposes committee of the Garden Cities and Town-Planning Association, after considering the amendments made in committee to the Housing and Town-Planning Bill, express the hope that differences of opinion as to Clause 30 will not be allowed to stand in the way of a smooth passage for the Bill through both Houses of Parliament. The committee hope that the principle of town planning will

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be incorporated into law at the earliest moment, and they deprecate any action which would jeopardise it.

THE building trade in Northampton is reported as being satisfactorily busy and of having prospects of becoming still more so. Among the public works in progress are:—Free library, extensions to the county hall, a county sanatorium at Creaton (Mr. Fred Dorman, architect), a school in Billing Road (Mr. Herbert Norman, architect), renovations at Kingsthorpe and St. Sepulchre's churches, golf club pavilion at Harlestone (Mr. Herbert Norman, architect), in addition to new houses, factory extensions and other works.

AT New Southgate last week an inquest was held on a carpenter who fell from a scaffold at East Finchley, and was almost instantaneously killed. The evidence showed that the scaffold was 16 feet from the ground, and the plank upon which the deceased stood 18 inches wide, and there was no guard round the scaffold. The jury returned a verdict of "Accidental death," and added a rider to the effect that all scaffolding, in their opinion, above the height of 12 feet should have a guard around it. This rider was ordered to be sent to the Home Office.

PLANS and sections of proposed new buildings, &c., in Dundee, have been lodged at the office of the city engineer, as follows:—Balgay Road, dwelling house for Marshall Meek; Clepington Road, stable for Robert Taylor & Sons, Ltd.; East Dock Street, roller skating rink for W. S. Cruickshank & Co.; Exchange Street, office and wash-house for David P. Whitton & Sons; Hawkhill, patching house and store for Thos. Bell & Sons; Jedburgh Road, dwelling house for David Grant; Murraygate and Cowgate, shops, offices and dwelling houses for Jas. Sibbald; Seagate, dwelling-house, office, and shed for Dundee Motor Carriage Company.

AT a recent meeting of the streets and buildings committee of the York Corporation, the following plans were approved:—British Petroleum Company, spirit store, Foss Islands Road; F. Clark, new stables and additions to house, 14 Vine Street; W. E. Jackson, alterations and additions to warehouse, Hallfield Road; G. H. & H. Douglas, two houses, Siward Street; W. West, four houses, Knavesmire Crescent; W. Walls, eight houses, Westwood Street; E. Relton, six houses, Lower Sutherland Street; A. D. Stuart, alterations, Crown Cottage, Heworth Green; J. J. Hunt, Ltd., roof covering, Queen Victoria Street; W. H. Waudby, new shop, Fossgate; Mrs. Forth, re-drainage, 32 and 34 New York Terrace; Barclay & Co., reconversion of shop into dwelling-house and shop, 36 Parliament Street.

DURING the month the following plans have been approved in Bolton:—Colonel R. H. Ainsworth, for addition to Moss Lea, Sharples; Mr. J. Haslam, for dairy at Edditch Fold Farm; Mr. James Taylor, for two houses off Entwistle Street; Mr. G. A. Hirst, for seven houses in Tonge Moor Road, Tonge; Mr. James Hoyle, for wash-house at 578 Bury Road, Breightmet; Mr. F. H. Cartwright, for twenty-one houses in Longfield Road, Halton; Mr. Oliver H. Haslam, for house in Victoria Road, Heaton; Mr. John Ives, four houses in Waddington Road; Messrs. Leigh Bros., for five houses at Halliwell Hall; and Mr. J. R. Ormrod, for two semi-detached villas in Newhall Lane, Smithills; T. E. Smith & Son, for addition to St. Thomas's School, Eskrick Street; Bolton education committee, for manual instruction school in Folds Road; Messrs. Crosses & Winkworth, Ltd., for new engine-house at No. 1 mill in Lever Street; Messrs. Cannons, Ltd., for extension to mill in Jackson Street; and Messrs. J. W. & J. P. Pilling, for eight houses off Bennett's Lane.

THE building plans committee of the Blackpool Corporation at their monthly meeting approved of twenty-two of the forty-five plans submitted. The plans sanctioned were as follows:—Detached dwelling house, greenhouse and buildings, Peddar's Lane, South Shore, J. W. Cardwell; three houses, Marlborough Road, John Whiteside; two houses, Westfield Road, John Porter; two houses, Whitegate Drive, A. J. Haworth; one house, Moon Street, Wm. Bamber; two houses, off Holmfield Road and Warbrick Hill Road, Jas. Leach; ten cottages, Onslow Road, G. F. Clarke; house and shop, corner of St. Walburga's Road and Onslow Road, Joseph Wignall; house, Park Road, Misses H. C., E. and M. J. Gourlay; eleven houses, Oxford Avenue, John Gregson; two houses, Palatine Road, Wm. Bailey; four houses, St. Alban's Road, Frank Lumb; elementary school, Queen Victoria Street, Blackpool education committee; elementary



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ILLUSTRATIONS.

THE CENTRAL STATION HOTEL, GLASGOW.—THE LARGE DINING-ROOM.

A FACADE IN KINGSWAY, LONDON.

HOUSE, GAYTON, CHESHIRE.

NEW FACTORY, SHEFFIELD.

school, Manchester Road, Blackpool education committee; additions to Arnold House school, South Shore, F. T. Pennington; shop front and alterations, Warbreck Road, W. J. Bramham; greenhouse, Gloucester Avenue, Mr. Clark; greenhouse, rear of 26 Oxford Avenue, John Gregson; verandahs, Waterloo Road and Moore Street, D. Heys; new streets, St. John's Estate, St. John's Estate Company.

VARIETIES.

THE Blackpool Town Council has confirmed a resolution appointing a sub-committee to consider a proposed extension of the promenade at South Shore to the borough boundary.

THE Wigton Board of Guardians on Tuesday decided to have the whole of the drainage system of the workhouse remodelled, thus doing away with the old system of cesspools.

EXCAVATIONS have been commenced preparatory to the erection of Messrs. Parkinson & Tomlinson's new mill adjoining the present premises in Chapel Street, Poulton. The new building will be four storeys high, and 74 feet long by 34 feet wide.

MAJOR J. STEWART, R.E., the inspector of the Local Government Board, will hold an inquiry on September 17 into the application of the Sheffield City Council for sanction to borrow 30,361*l.* for the purchase of land at Blackburn Meadows, Rotherham, for purposes of sewage disposal.

PLANS have been deposited at the borough surveyor's office, Derby, for a hippodrome and music-hall to accommodate 2,000 people, which the North-Midland Theatres Syndicate, Ltd., contemplate erecting at the corner of Macklin Street and Green Lane.

MESSRS. SPRAKES & SON, of Doncaster, have secured the contract for the erection of three lock-up shops and organ factory, at the Factory Lane end of Trafford Street, Doncaster, the amount being 3,000*l.* Messrs. Rudolf Wolff & Sons' works from Bradford and Nether Hall Road, Doncaster, are to be removed to these new premises.

A SCHEME of main sewerage and sewage disposal for Norham has been submitted to the Norham and Islandshires Rural District Council by Messrs. D. Balfour & Son, of Newcastle-on-Tyne and London. The works consist in the providing of main sewers for the drainage of the town and the disposal of the sewage by liquefying tanks and continuous filters, the effluent from which will be discharged into the river Tweed. The storm water will be dealt with in storm-water tanks without further treatment.

THE Warrington Town Council on Tuesday considered a recommendation that the borough surveyor should prepare a statement and description of a new bridge across the Mersey, and that specifications, designs, and tenders should be obtained from firms experienced in ferro-concrete work. It was ultimately agreed that the recommendation should be referred back, with a view to the appointment of a special engineer.

CHATSWORTH HOUSE, which has been closed to tourists during the past year owing to extensive alterations being carried out, is to be reopened. The Duke of Devonshire proposes to open the house from the first Tuesday in May till the first Friday in August, on Tuesdays, Wednesdays and Thursdays. A charge of one shilling will be made for each person. A short guide-book and competent guides will be provided free of charge. The average number of tourists is about 80,000 a year.

THE manner in which the enterprising engineer can study economy is provided by an instance at the Cane Hill asylum of the London County Council. A system of centralisation of the hot water arrangements is being introduced to replace the old-fashioned system under which the hot water was kept in as many as thirty-six separate storage tanks located in the roof spaces of the various wards. By introducing the system of one huge tank in a tower and pumping the water

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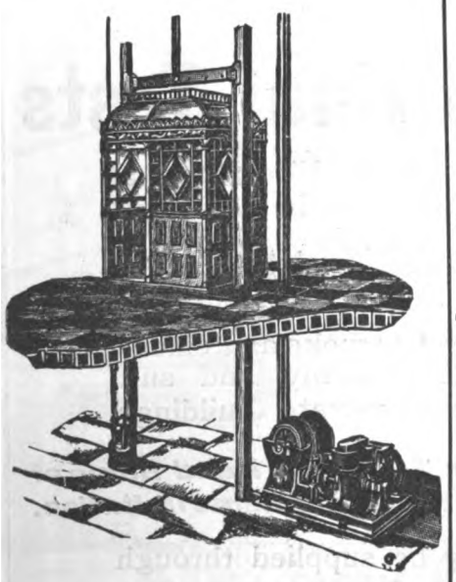
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to the wards, a saving of hundreds of pounds will be effected. Under the old system the quantity of steam coal used was about 3,500 tons a year, costing about 4,200*l*. By the new system a reduction in the coal bill of 520 tons a year is anticipated. The new system has already been introduced at some of the big asylums and the saving effected has proved to be even greater than the estimated saving at Cane Hill.

SANITARY CERTIFICATION OF DWELLINGS.

THE annual congress of the Incorporated Sanitary Association of Scotland was held in Ayr last week. Amongst the numerous papers read was one by Mr. Robert Adam, sanitary inspector, Ayr, on "The Sanitary Certification of Dwelling-houses." The following report appears in the *Ayr Obeserver*:—He said that in view of the provisions of Clauses 14 and 30 of the Housing and Town-Planning Bill the question appeared to be worthy of discussion. The increased knowledge of hygiene that now obtained among the people had caused a more intelligent interest to be taken in the sanitary condition of houses, and more particularly those intended to be occupied by new tenants. This was reflected by the increasing number of inquiries by intending occupiers and summer visitors as to whether such and such a house was "sanitary" and "the drains all right." "No man should, and no prudent man will become the tenant of a house without first having the drains and sanitary arrangements examined, and, if a tenant enters into possession without having done so, he may, in my opinion, fairly enough be assumed to be satisfied that they are in order, and to have taken the risk of any latent defect." So said an eminent judge in giving judgment in an action for damages arising from bad drainage. Experience showed that a very large proportion of the people were ignorant in matters of house construction and sanitary fitments, and, unless where there were defects on the surface visible to the eye, they were unable to judge for themselves as to whether a house was reasonably fit for habitation. Surface defects might be readily noticed by the tyro, but surface defects did not constitute all the danger. It was those under cover and hidden from view that the greatest danger came from. This led him to the principle that he contended for in the paper—that every new or intending tenant of a house, no matter the amount of rent to be paid, should be entitled, on application to the sanitary authority, to receive a certificate that such house had been surveyed, and was or was not reasonably fit for human habitation at the time of entry. Of course, there were cases where a tenant, in removing from one house to another, had to submit to a good deal of discomfort and inconvenience. He must often take possession, for instance, before the necessary re-papering and painting of the house was completed, or minor repairs made on the plaster and woodwork, but these, though disagreeable, were nothing more. It would be unreasonable to say that repairs like these rendered the house untenable at the time of entry. It was a very different thing when the house was insanitary through defects of structure, defects of ventilation, and other similar defects that went to make a house uncomfortable and dangerous to the inmates. Having described the system of sanitary certification practised in Ayr, Mr. Adam went on to say that if the principle of certification was right in regard to new buildings, it seemed to be all the more needed at existing buildings, because new houses might soon become insanitary through the breakages caused by the settlement of the ground and walls of the building, and existing houses through wear and tear of the structure, misuse of the sanitary appliances, and the absence of skilled supervision of repairs made on the drainage system. This latter was, in his experience, the most prolific cause of defects, and has spoiled and made dangerous many of what were otherwise good and efficient systems of drainage. To protect himself and family the prudent tenant has recourse to one or other of the private expert agencies for guidance and help. He did not object to appeals to such agencies, but the cost of employing these agencies was beyond the reach of most people, and was confined to the comparatively rich, and he contended that intending tenants of existing houses were entitled to look to the sanitary authority, as guardians of the public health, for guidance and advice on a matter that concerned so very much the health of their household. This appeared to be the view adopted in the 30th Clause of the Housing and Town-Planning Bill. In that clause every local authority was required to cause to be made in every

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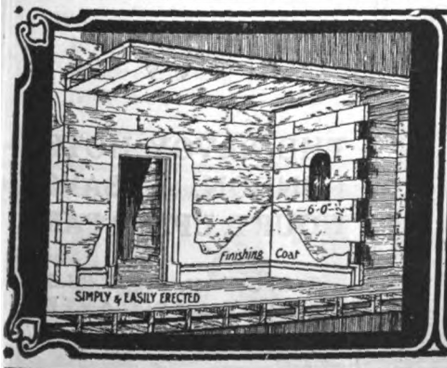
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parish or district an inspection and survey of every dwelling-house. The local authority was also required to keep a register, and to register particulars concerning every dwelling-house within their district. The particulars were to include, amongst other matters, the number and description of rooms and offices in each house, the state of repair of the dwelling, and its sanitary condition and water supply. The register was to be open for inspection by any ratepayer within the county or district. The first survey and register was to be commenced within twelve months and completed within five years after the passing of the Bill, and a new survey was to be made and the register revised every five years thereafter. A clause such as that must have a far-reaching effect for improvement in house sanitation, and the advantages to be gained from registration and periodical inspection of dwellings could not be over-estimated. The clause, however, had several defects. Like Clause 14, its operations were limited in Scotland to houses rented at 16*l.* and under. Why that should be so was difficult to understand. It could not be said that all houses rented at over 16*l.* were not in as much need of registration and periodical inspection as those to which the clause was confined. In practice it was found that the better the class of house the greater the possibility of sanitary defect, because the number and variety of conveniences provided were greater than in cottages and tenement houses. Another defect was that ratepayers only had the right to inspect the register. That was hard on a person who purposed taking a house in another town, or the townsman taking up house who had not yet qualified as a ratepayer. He was to be debarred from getting information from an accredited authority as to the sanitary condition of the house for which he was negotiating. The same with the visitor who purposed taking up quarters for a time at any of our coast towns or health resorts. Of course, there might be objections to allowing all persons getting access to the register, but surely *bonâ-fide* applicants such as these were entitled to the same privilege as accorded in the Bill to ratepayers. It might be said that the surveying and sanitary certification of dwellings were outside the province of a local authority, that they would interfere with private enterprise, and that officials could not afford the time for the work. He did not agree with this view. On the contrary, he thought that, as guardians of the public health, it was the duty of the local authority to encourage and help persons seeking advice and assistance in matters affecting the health of their household. Certification would necessitate the thorough inspection, and therefore the detection, of any insanitary conditions, and it was surely better for a local authority to prevent the danger from these conditions than to attempt to right it afterwards. It was not proposed to act in competition with private agencies. Persons preferring private agencies, and able and willing to pay for the same, were not precluded from doing so. Apart from that, it was a well-established principle that private interests in matters affecting the public health must give way to the public interests. With regard to the extra demands likely to be made on the time of sanitary officials, he thought that would prove more imaginary than real. No matter how some might deplore the fact, it had also to be pointed out that the careless and indifferent tenant was not likely to give trouble in this respect. This class formed a fairly large proportion of the yearly removals, and they were usually satisfied to find the papering and painting work to their taste, and the house generally not likely to give trouble in the way of cleaning. It was from the prudent and right-thinking persons that most of the applications for certificates would come, and he submitted that this was a class that deserved every encouragement in this direction from local authorities, for by precept and example, and living to sanitary conditions, they helped very materially to educate the careless and indifferent to their duties and responsibilities in matters affecting the public health.

THE NAPIER BRIDGE, AT MADRAS.

CONSTRUCTION of a new bridge to replace the present old structure, known as the Napier Bridge, at Madras, has at last been sanctioned by the Indian Government, at an estimated cost of 3 lakhs of rupees. The original proposal was, says *Indian Engineering*, to construct a bridge which might eventually be used as a regulator in connection with a scheme for improving the Cooum River; and designs were prepared for a masonry bridge with small spans of 40 feet and with

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a floor, but this involved the raising of the roadway some 8 feet above the general level of the Marina, rendering necessary the construction of long ramps, which would not only be expensive, but also objectionable from the point of view of traffic. It was also found that the provision of gates could only be of service either in connection with a canal harbour scheme under which the Cooum would be filled by the incoming tide through the canal and emptied on the ebb through the gates, or in connection with a pumping scheme to raise the level of the water in the Cooum above sea-level and to give it periodical flushings by means of the gates. There is, however, no probability at present of a canal harbour scheme being undertaken, and a grave objection to the pumping scheme is the fact that owing to the low level of the area in the city of Madras known as the "Island" and of other areas in the vicinity, it would be impracticable to raise the water level of the river to any appreciable extent above sea-level without flooding these areas. The original proposal has accordingly been abandoned, and the present scheme provides for an ordinary bridge for traffic purposes only. The design is for a bridge of six spans of 75 feet each; including the space occupied by the piers the length between abutments will be 480 feet. Provision is made for a 27-foot roadway and a pathway 9 feet wide, the total clear width between girders being 36 feet. The loads allowed will admit of a 15-ton road-roller being used on the bridge, and a crowd load of 100 lb. per square foot; this provision seems suitable for all contingencies. The steelwork will consist of twelve main girders for the six spans, and sixty-six cross girders (eleven to each span). The flooring will consist of concrete arching reinforced on the soffit with expanded metal. This form of roadway has been especially adopted in order to cover the steelwork of the cross girders and to have no steelwork exposed to the air in those parts of the bridge which cannot be easily inspected, the bridge being near the sea. Altogether the new bridge will be a substantial structure for up-to-date loads, and the only exposed steelwork will be in the main girders, which can be easily got at and which will be efficiently painted at regular intervals. The new bridge should therefore last a considerable time. Half the estimated cost of the work will be borne by the Corporation of Madras.

GERMAN CEMENT PRODUCTION.

ACCORDING to the British Consul at Hamburg the expectations of the German cement industry at the commencement of 1908 were not fully realised. In consequence of the financial crisis there was a falling-off in the building trade, and particularly in the building of cheap houses, and the owners of factories which were not fully occupied showed little inclination to embark on alterations or extensions, and therefore large stocks of cement accumulated during the summer at the cement factories. The latter sought relief in the export market, with the result that the export prices experienced a rapid fall of nearly 25 per cent. Owing to the demand brought about by these low prices several of the syndicates disposed of a considerable portion of their stocks. The financial results realised during the year by the German cement works were nevertheless regarded upon the whole as good, in spite of the unfavourable state of trade, because the prices, regulated in the interior of Germany by means of agreements between the syndicates, ensured a good profit. These agreements have been renewed for 1909, and among the German cement works there has for several months past been an effort to raise the export prices, which had sunk far below the normal. Steps have, moreover, been already taken in this direction, and a minimum price has been fixed. It is said also that efforts have been made with some success to secure the adhesion of the British and Belgian cement industries, and it is anticipated that it will be possible to form international agreements for the regulation of export prices. The total output of cement in Germany in 1908 is estimated to have been as follows, in casks of 180 kilos.:—

Portland cement	23,000,000
"Iron" Portland and Schlodron .	2,250,000
Roman	650,000
Total	25,900,000

The factories are, however, said to be capable of turning out nearly double this quantity. Of the total number of cement factories in Germany—viz. 142—ninety-seven manufacture only Portland.

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WATER-POWER IN CANADA.

THE address of Sir W. H. White, K.C.B., as President of the Engineering Section of the British Association, was mainly devoted to an illustration of the close connection which exists between the work of civil engineers and the foundation as well as the development of British Colonies and Dominions beyond the seas. One of the chief fields of engineering operations at the present time is, he said, to be found in the Dominion of Canada, whose governing authorities have appreciated the fact that bold enterprise and generous financial provision for the execution of great engineering works are essential to the progress and prosperity of the country. Its vast extent, its magnificent lakes and rivers, its agricultural and mineral riches, its forests, its unrivalled water-power and many other potential sources of future wealth and progress, furnish exceptional incentives and opportunities to the engineer. From an early period in the history of Canada this fact has been realised, and attempts have been made to utilise natural advantages; while the same policy has been energetically adopted since the Dominion was established forty-two years ago. After dealing with railways, inland navigation and shipping, Sir William went on to speak of water-power as follows:—

Canada has unrivalled resources in water-power, and its extent and possible utilisation have been made the subject of investigation by engineers for many years past. One of the most important memoirs on the subject was presented to the Royal Society of Canada in his presidential address of 1899 by Mr. Keefer, C.M.G. In recent times many other engineers have studied the subject and carried out important works. Exact knowledge of the total power represented by the waterfalls and rapids of the Dominion is not available, nor can any close estimate be made of the power which may be employed hereafter in factories, mills, or industrial processes, because profitable employment obviously depends upon commercial considerations, which must be governed largely by the localities in which water-power may be found, and the cost of works and of transmission of energy to places where it can be utilised. It has been estimated that on the line from Lake Superior through the chain of lakes and rivers leading to Niagara and thence through the St. Lawrence to the sea 11,000,000 horse-power may be developed. Mr. Langelier has estimated that in the Province of Quebec the water-power aggregates more than 18,000,000 horse-power; other provinces all possess large resources of the same kind as yet untouched. The most striking example of the utilisation of water-power is that on the Niagara River, which the writer had the good fortune to visit in 1904, during his presidency of the Institution of Civil Engineers; the works on the Canadian side were then in full progress, and at a stage which enabled one to realise completely their great difficulty and immense scale. The three companies whose works are near the Falls on the Canadian side have provided for a total ultimate development of over 400,000 horse-power, and a fourth establishment lower down the river, intended chiefly for the use of Hamilton, is to develop 40,000 horse-power. In the construction of the works, in the electric generating plant, the arrangements for transmitting power over long distances, and other features of importance remarkable engineering skill and daring have been displayed. American capital and enterprise have had much to do with these undertakings, as they have with many other important Canadian enterprises; but it may be hoped that British capital will keep its lead and be freely employed in the development and utilisation of all the resources of the Dominion, including that magnificent asset its water-power. The applications of water-power are already very numerous, including not merely the creation of electrical energy and its use for lighting and power in towns and factories situated at considerable distances from the Falls, but for manufactures and industrial processes carried on near the Falls. Amongst these manufactures that of aluminium and carbide of calcium may be mentioned, while paper and pulp mills and sawmills constitute important industries. Great advances have been made in the transmission of electrical power over long distances, and very high pressures are being used. Electric traction on railways and tramways also derives its power from the same sources, and is being rapidly developed. In 1901 there were 553 miles of electric railways, and in 1907 815 miles.

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THE PRACTICAL STERILISATION OF WATER AND OF SEWAGE EFFLUENTS.*

(Concluded from last week.)

Chlorine Experiments.

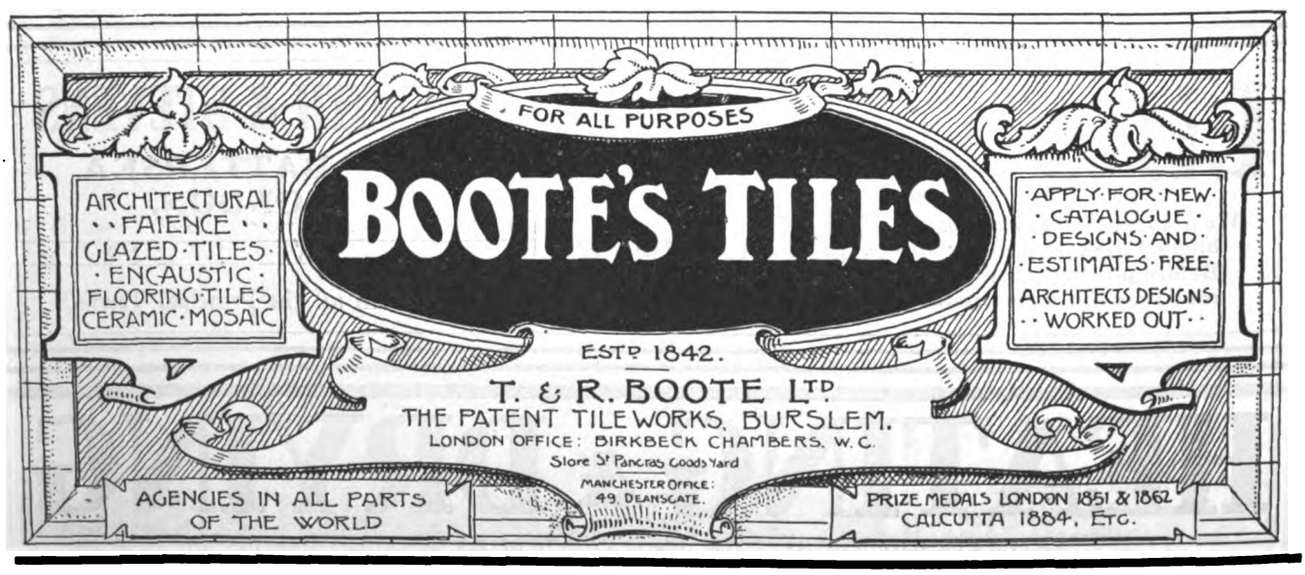
FOR the chlorine experiments, calcium hypochlorite or bleaching powder was selected, costing 4 cents. (2*d.*) per pound, and showing on analysis 34 per cent. of available chlorine. It was found that unless special precautions were taken in dissolving the chloride of lime, many large lumps which enclose chlorine remained, and materially reduced the efficiency of a given weight of the chemical. A weighed quantity of chloride of lime was placed in a shallow box and covered with sufficient water to form a smooth paste. Warm water was then added until the heavier particles settled, thus allowing the soluble and finely divided chloride of lime to be decanted. After decantation more water was added, the coarse lumps were broken up, and the process repeated until as much as possible had gone into the solution.

Experiments were carried out at the Boys' Industrial School, Lancaster, Ohio. The sand filter effluent was treated with available chlorine varying from 3.6 to 4 parts per 1,000,000, taking the daily average. Coli organisms were completely removed, and the removal of the total number of organisms was from 99.8 to 99.9 per cent. The solution was discharged into the sewage at the rate of .75 gallons a minute, and variations in the quantity of chlorine applied were made by changing the strength of the hypochlorite solution. The cost of constructing the plant for treating sand filter effluent in this manner may be taken at $92 (18*l.* 8*s.*), and it is estimated that the annual cost of applying 4 parts to the 1,000,000 of available chlorine to a sand filter effluent flow of 160,000 gallons per diem would be about $924 (184*l.* 16*s.*), including labour, proportioned as follows:—7,770 lb. of chloride of lime at 2½ cents per pound, $194.25 (38*l.* 17*s.*); labour, one man 365 days at $2 a day, $730 (146*l.*). Capitalised at 5 per cent., this would represent an investment of $18,500 (3,700*l.*).

At Marion the rate of application of the chloride of lime was three gallons a minute. Experiments were carried out with the effluents from sand filters, from contact beds, and from septic tanks. The effluents from the sand filters were treated with a quantity of chlorine equal to 3.8, 3.0, and 1.5 parts to 1,000,000, which removed 99.8, 99.7, and 94.3 per cent. of the total number of organisms respectively. The coli appear to have been entirely removed, excepting in the case of effluent treated with 1.5 parts to the 1,000,000. The effluent from the contact beds (which, by the way, do not appear to have been properly used, seeing that they were at times acting as streaming filters), contained organic matter of a more putrescent character than did the sand effluent, and at the end of the discharge the strength of the chlorine applied had to be greatly increased, the quantity ranging from a minimum of 1.7 to a maximum of 31.8 parts per 1,000,000. It appears, therefore, that the results are not of much value as a basis for contact beds in proper condition and properly worked, for it is obvious that when a contact bed is at times used as a streaming filter, it is likely to become foul, and that the experiments must have been conducted with a liquid of very poor quality, not comparable with a good contact bed effluent. An average quantity of chlorine of 2.9 parts to 1,000,000, however, sufficed to remove 97.8 per cent. of the total organisms, and bacillus coli could not be detected in .5 cubic centimetre of the effluent after treatment. With an average of 5 parts to the 1,000,000, the reduction of the total organisms was 99.5 per cent., bacillus coli being usually absent in .5 cubic centimetre. With an average of 4.4 parts to the 1,000,000, the total removal of bacteria was 99.8 per cent., and bacillus coli was usually absent in 1 cubic centimetre. It should be observed that in these tests, both in the case of the sand filter and of the contact bed effluents, the tests for residual chlorine in the treated effluent were always negative at the end of the tank. The addition of 5 parts of chlorine to the 1,000,000 in the case of septic tank effluent did not suffice to effect very material removal of either total bacteria or fermenting organisms. The 25 parts to the 1,000,000 of applied available chlorine were sufficient to remove a substantial

* A paper read at the Building Trades Exhibition by H. C. H. Shenton, M.S.E.

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proportion of coli-like organisms, although a complete removal of bacillus coli was not accomplished. An addition of 48.5 parts to the 1,000,000 was found to give results only slightly better than in the case of the application of 25 parts to the 1,000,000. But it is noted that the amount of suspended matter in the septic tank effluent had increased considerably, and this probably in large part explains the low removals obtained by that increased quantity of applied chemical. This clearly emphasises the fact that it is difficult to sterilise the effluent from an ordinary septic tank, and that some special provision must be made in such cases to avoid large masses of organic matter coming over the tank weir. The cost of constructing plant for treating the several effluents at the Marion sewage works may be taken as $151 (30*l.* 4*s.*), allowing for the continuous treatment of 600,000 gallons in twenty-four hours. The cost of applying 4 parts to the 1,000,000 of available chlorine to sand filter effluent is $730 (146*l.*) only. The total annual cost, including labour, but excluding the cost of supplying water for preparing the chlorine solution, will be about $1,620 (324*l.*); capitalised at 5 per cent. this would represent an investment of $29,000 (5,800*l.*). The cost of applying 5 parts to the 1,000,000 of available chlorine to the contact filter effluent of poor quality for reasons above stated would be about $2.5 (10*s.*) a day, requiring about 100 lb. of the chemical; the total annual cost, including labour, but excluding water supply, would be about $1,640 (328*l.*); capitalised at 5 per cent. this would represent an investment of $34,000 (6,800*l.*). Similarly, assuming 25 parts to the 1,000,000 as a fair average figure for the sterilisation of septic tank effluent, provided this effluent is at all times free from abnormal amounts of suspended matters, the total annual cost, including labour, would be about $5,300 (1,060*l.*). Capitalised at 5 per cent. this would represent an investment of $106,000 (21,200*l.*). The author has attempted to give a brief review of this important American report, which should, however, be studied in its entirety.

Baltimore Sewage Sterilisation.

In the course of a discussion upon a paper read before the Boston Society of Engineers by Mr. H. W. Clarke, chemist of the Massachusetts Board of Health, Prof. Winslow stated that the problem of the removal of bacteria from effluents was not only well in hand, but it was now generally recognised that it could be accomplished sufficiently and economically by treatment with chloride of lime. Later another speaker said :—" During the past year we have, with the collaboration of Prof. Phelps, carried out in Baltimore at the Walbrook sewage testing station a series of experiments on the disinfection of sprinkling filter effluents with solutions of chlorine bleaching powder. Our results have been so extremely satisfactory that the final plants for the sewage disposal works at Baltimore will include a chlorine disinfection plant."

It is considered probable that it will be practicable to secure an effluent as well purified and as stable from a shallow bed, treated with large quantities of chlorine, as can be obtained from a deeper bed treated with small quantities of chlorine.

Conclusions.

It is difficult to compare prices exactly owing to the varying conditions in the cases concerning which figures are to be obtained.

The prices which are available show what at first appears to be an almost incomprehensible difference, but they are not quoted for comparison, but merely as a matter of general interest.

For instance, at Marion, Ohio, the cost of sterilisation per 1,000,000 gallons with chloride of lime appears to be about 27*s.* 8½*d.* (4 parts of available chlorine per 1,000,000), while at Boston, with 5 parts of chlorine per million, the cost is 4*s.* 4½*d.* per 1,000,000 gallons.

We are told in a paper read before the Nova Scotia Society of Engineers that the cost of sterilising the Philadelphia water by the Vosmayer ozone process costs from 6*s.* 6*d.* to 15*s.* 2*d.* per 1,000,000 gallons. Here the water is very bad.

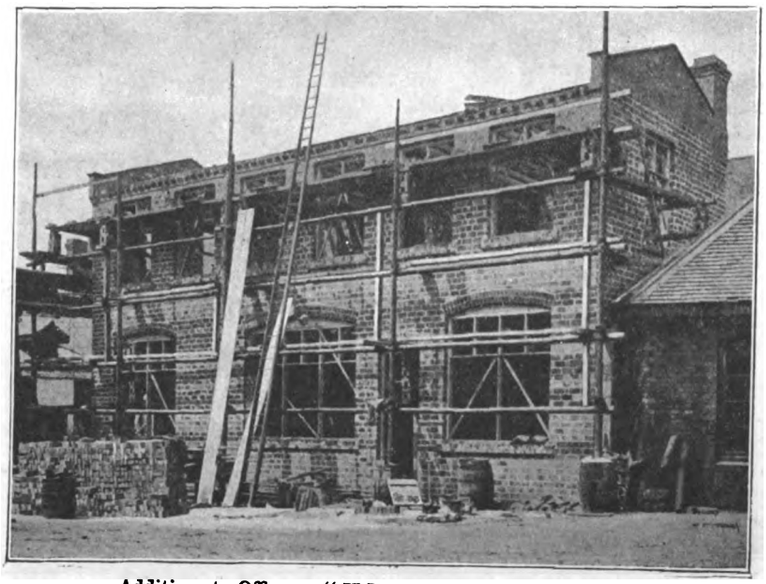
The figures of the Lahmeyer Company, which presumably refer to a water of average quality, give a price of from 41*s.* 8*d.* to 62*s.* 6*d.* per 1,000,000 gallons, taking the cost of the electrical power at from 1*d.* to 1½*d.* per unit and allowing for many things probably omitted in other prices.

Dr. Rideal, in his paper referred to, gave an estimate relating to Paris, where, assuming the cost of the electric

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power to be .055 fr. per unit (a very low figure), the cost of ozone sterilisation would be ¼*d.* per 1,000 gallons, or 27*s.* 9*d.* per 1,000,000 gallons.

The treatment of sewage by ozone appears, from the figures given in this paper, to be about 6*l.* 11*s.* per 1,000,000 gallons.

In the Digby-Shenton paper already referred to it was demonstrated that at London prices 1 kilogramme of available chlorine in the form of hypochlorite can be produced by modern electrolysers with guaranteed output for 10*d.*, taking electrical power at 1*d.*, per unit and salt at 1*d.* for 10 lb. This price does not include labour. Working on the basis given the cost of treatment would be as follows:—

Parts per million of Chlorine.	Price per million Gallons treated.	
	s.	*d.*
1	3	9½
2	7	7
3	11	4½
4	15	2
5	19	0

It was established by Drs. Kautbach and Rideal in the Maidenhead experiments, that 1 gramme of available chlorine would sterilise 1.21 cubic metres of settling tank effluent, or 1.5 cubic metres of filter effluent. In any good modern electrolyser 1 B.T.U. will produce from 152 to 200 grammes of available chlorine. Taking the lower figure we obtain sterilisation of an unfiltered sewage effluent at a rate of 24.95 B.T.U. per 1,000.000 gallons by hypochlorite as against the rate of 133 B.T.U. per 1,000,000 gallons by the ozone process at Paris, as described by Dr. Rideal in his ozone paper, which process was dealing with water and not with sewage.

In the author's opinion, therefore, it is clear that hypochlorite sterilisation must be much more economical than ozone treatment, making every allowance for the price of salt.

As a result of the experiments and researches conducted up to the present time, several conclusions may be arrived at:—

(1) That the sterilisation of sewage in large quantities is practically and economically possible.

(2) That this may be most economically effected by careful use of chemically prepared hypochlorite at very small works, and at larger works, or works of moderate size, by the use of electrolytic hypochlorite.

(3) That such treatment may be given where required to tank effluents as will render them inoffensive, and that when necessary such effluents can be sterilised. This is of particular importance in the case of sea outfalls near fisheries or oyster-beds, where a very great saving might certainly be effected by sterilising a good tank effluent from which suspended matters were removed. Such an effluent could not possibly harm the fish, and the cost of filtration would be partly or entirely eliminated. There are many authorities which discharge their sewage into the sea or into tidal estuaries, whose difficulties would vanish if they clearly understood the possibilities of sterilisation.

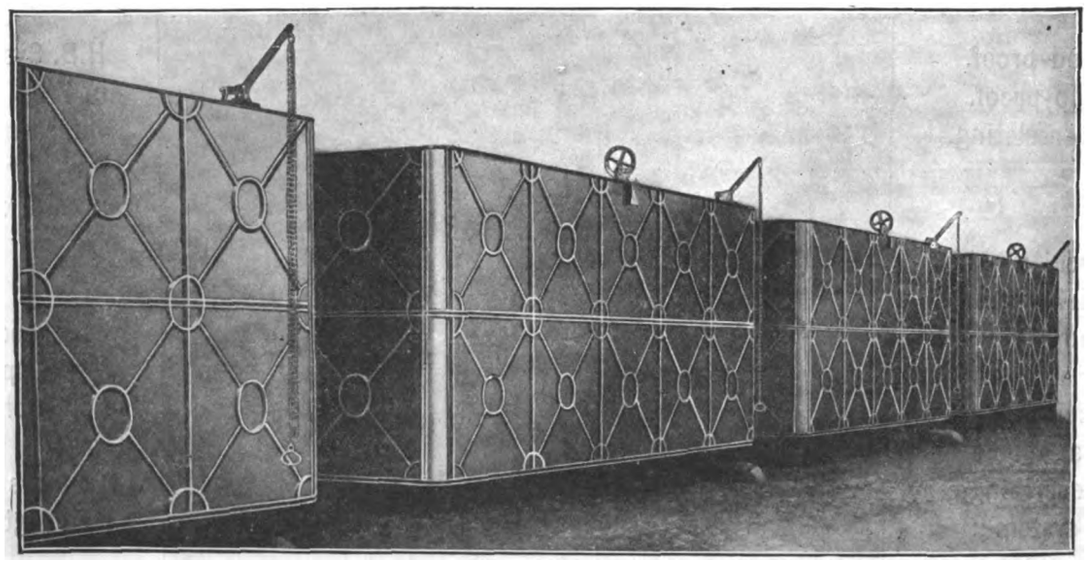
(4) It is possible to remove clogging matter due to growths in filters or in sprinkling apparatus, by a strong dose of hypochlorite. This method of cleaning filters or apparatus may be regarded as important, and might be extremely important under certain conditions. It does not appear at present that any other treatment can compare economically with hypochlorite treatment, though, of course, the possibilities of cheapening other processes in the future should be borne in mind.

(5) That sterilisation of water by the ozone processes has now been adopted so largely as to leave no doubt as to its practical and economical possibility.

(6) That the sterilisation of water by means of electrolytic hypochlorite is also possible, and that though not generally adopted at present the system should be carefully tested, as it would apparently be a cheaper process. For this reason comparative experiments are desirable.

From the facts stated, it will be seen that there is abundant evidence that the cost of plant, labour, and chemicals in the hypochlorite process is not excessive, and when one remembers the enormous sums which have been cheerfully spent in the past on chemicals added to sewage for precipitation purposes, one is surprised that there should be such an outcry against expense where it is proposed to do so much less in order to obtain a result so much greater.

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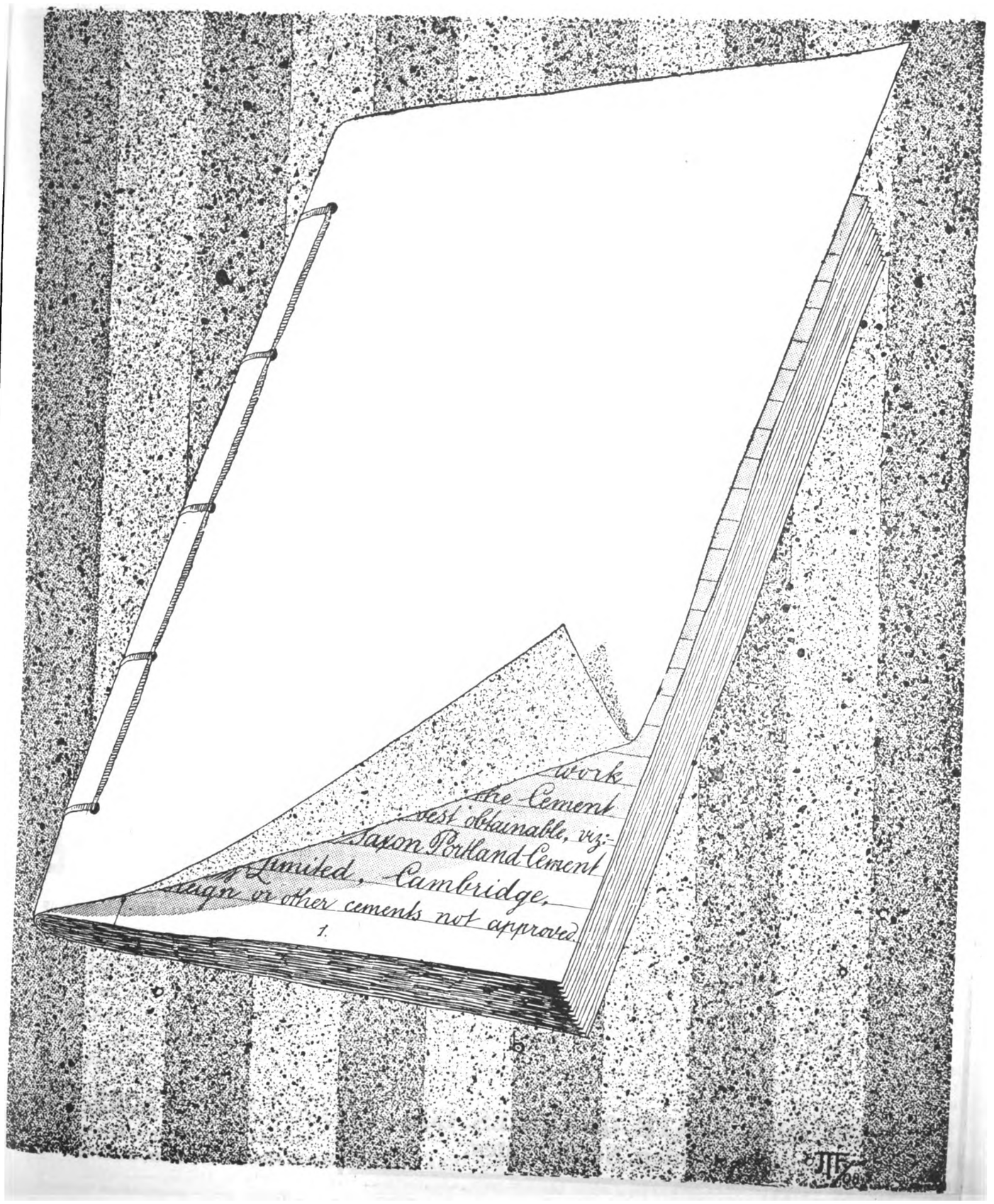


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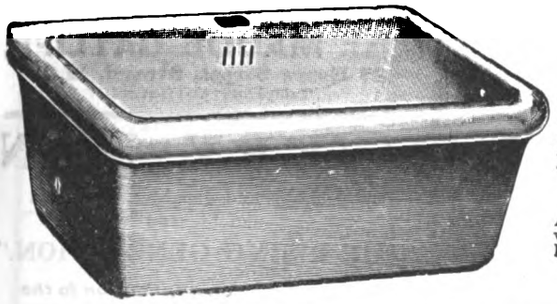
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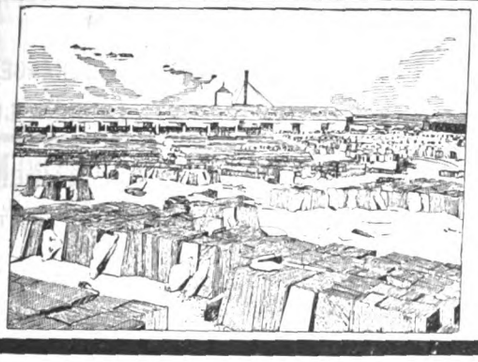
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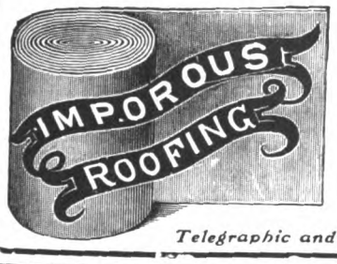
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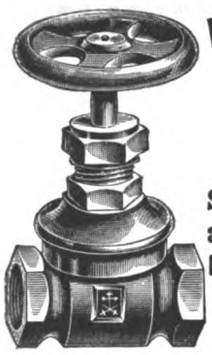


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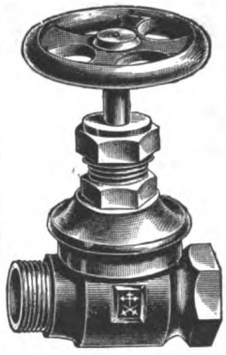


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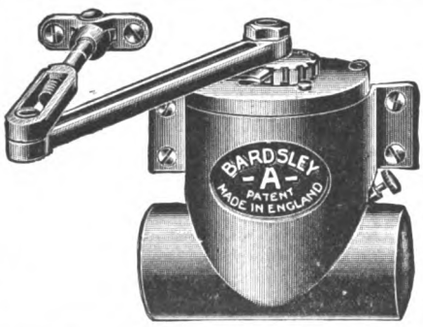
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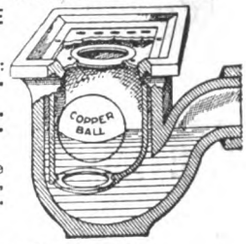
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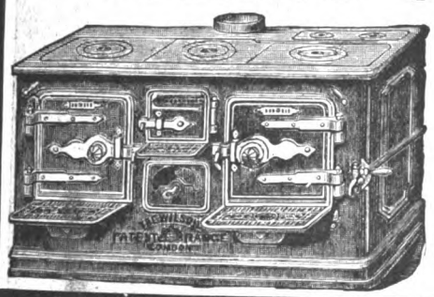
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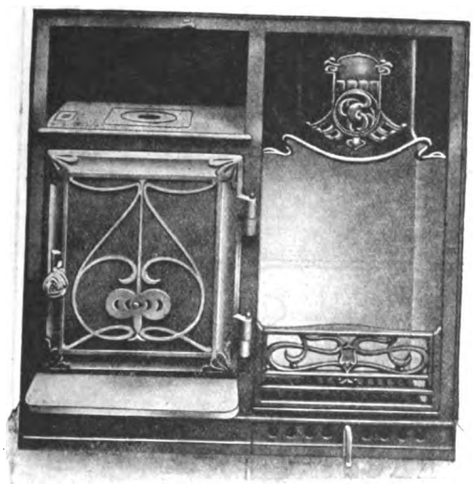
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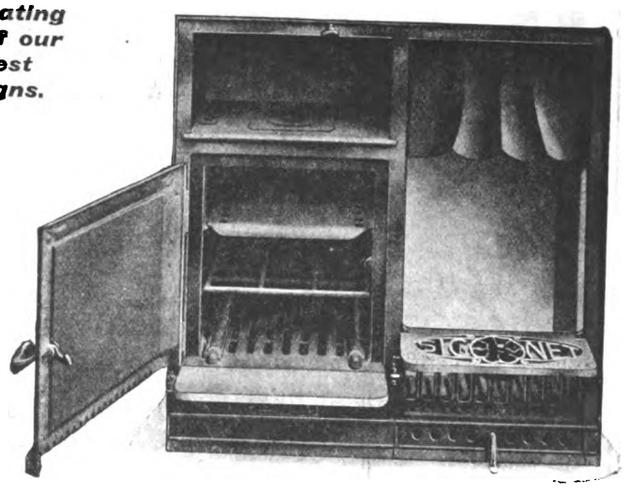
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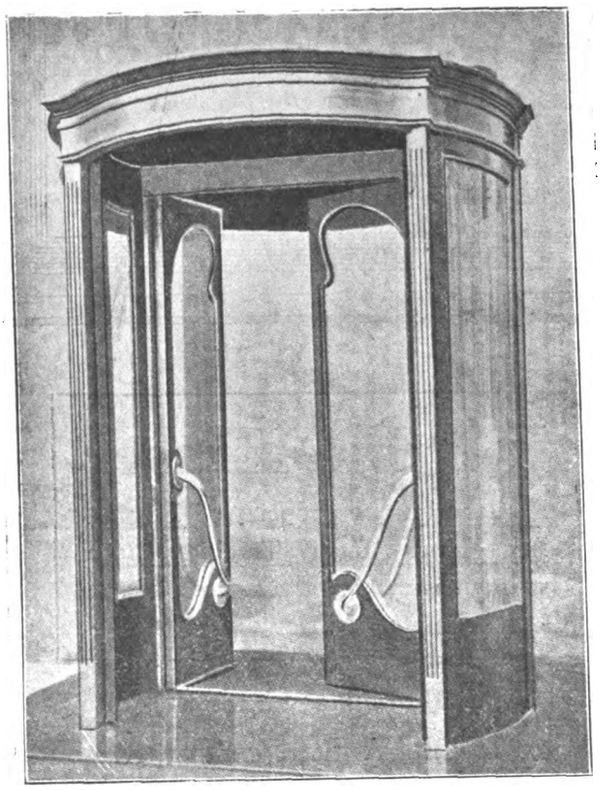
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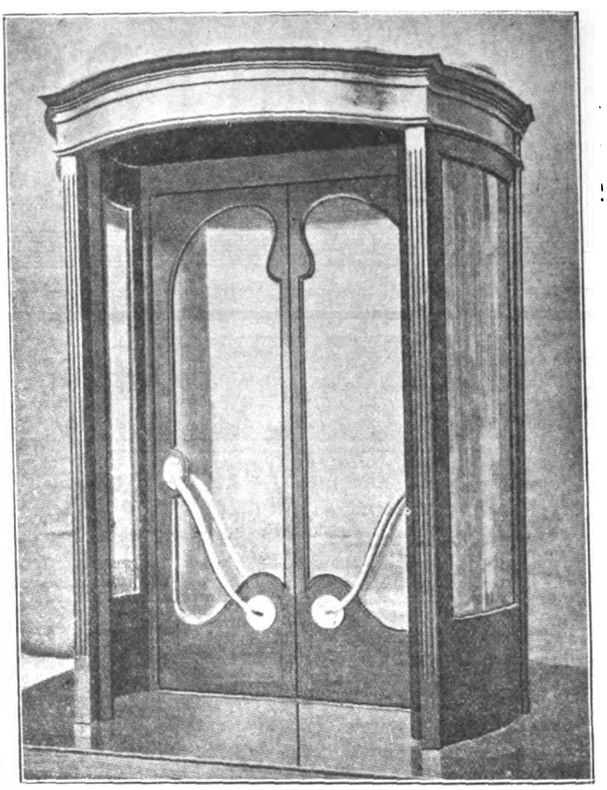
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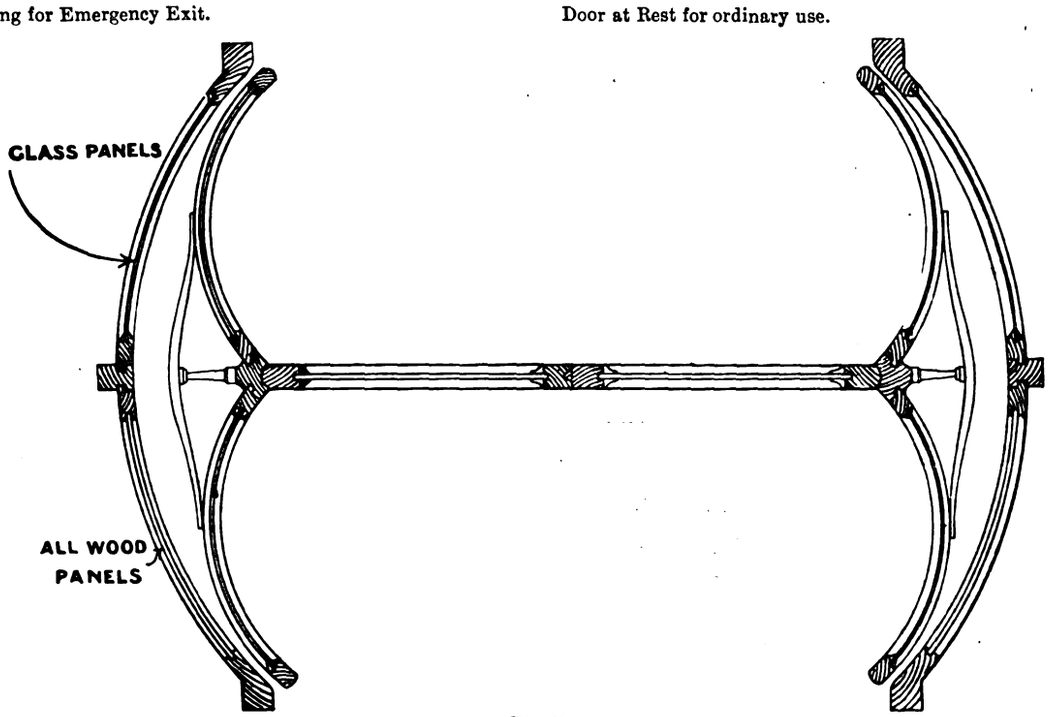
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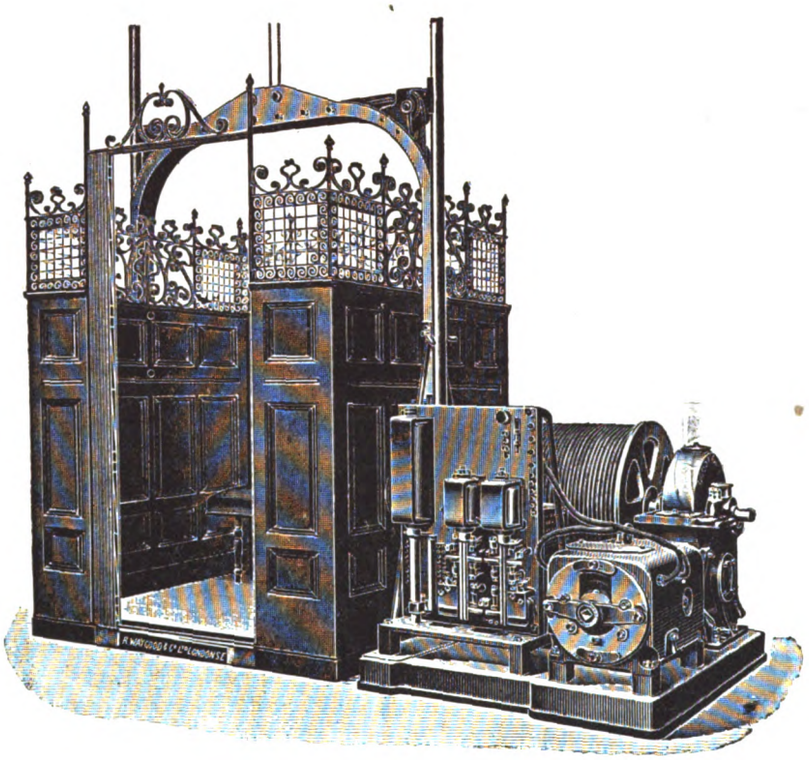
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Architect and Contract Reporter.

FRIDAY, SEPT. 17, 1909.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

HULL.—Oct. 18.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

KENDAL.—Nov. 1.—The Corporation invite architects residing and practising in Westmorland to submit designs with description and estimate of a technical school. Premiums of 15*l.*, 10*l.*, and 5*l.* are offered.. The Borough Surveyor, Kendal.

PRESTON.—Nov. 1.—The Corporation invite designs for a boys' grammar school. Premiums of 50*l.*, 30*l.* and 20*l.* Mr. Alfred Howarth, town clerk, Town Hall, Preston.

WALES.—Oct. 1.—The Urban District Council of Aberdare invite competitive designs for a fever hospital for fifty-two patients, including administrative block, outbuildings, &c. Premiums of 100*l.*, 50*l.* and 25*l.* An assessor will be appointed on the nomination of the President of the R.I.B.A. Deposit 3*l.* 3*s.* Mr. T. Phillips, clerk, Town Hall, Aberdare.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

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CONTRACTS OPEN.

ABBERTON.—Sept. 21.—For building a new bridge for the Lexden and Winstree Rural District Council. Mr. John Ennals, surveyor, Lexden.

AYLESBURY.—Sept. 18.—For internal alterations at the Judges' Lodgings for providing offices upon the upper floor. Mr. R. J. Thomas, county surveyor, County Hall, Aylesbury, Bucks.

BERKHAMSTED.—Sept. 25.—For the erection of a junior school and hall on the north side of the Grammar school quadrangle. Messrs. C. H. & N. A. Rew, architects, Berkhamsted.

BRISTOL.—Sept. 21.—For builder's, plumber's and electrician's work (separate tenders) connected with the erection of a Council school at Alexandra Park, Fishponds. Deposit 2*l*. 2*s*. Messrs. Rodway & Dening, architects, Gaunt House, Orchard Street, Bristol.

BURY.—Sept. 20.—For the rebuilding of the fronts of shops, Nos. 60, 62 and 64 Bolton Street. Mr. Arthur W. Bradley, A.M.I.C.E., borough engineer and surveyor, Bank Street, Bury.

CALSTOCK.—Sept. 29.—For the alterations and redecorating to the Wesleyan chapel and schoolroom. Deposit 1*l*. 1*s*. Mr. A. Lawry, Tharsis Villa, Calstock, Cornwall.

CAMBORNE.—Sept. 30.—For the construction of an open service reservoir, 1,000,000 gallons capacity, a water tower 20,000 gallons capacity, and sundry other works. Deposit 3*l*. 3*s*. The Camborne Water Company, Camborne.

CAMBRIDGE.—Sept. 20.—For erection of additions to the sewage pumping station, Riverside. The Borough Surveyor, Guildhall, Cambridge.

CANTERBURY.—Sept. 30.—For enlargements and alterations at St. Augustine's Sessions House, Longport Street. Deposit 2*l*. 2*s*. The County Architect, 86 Week Street, Maidstone.

EDINBURGH.—Sept. 27.—For the several works to be executed in the conversion of an existing building at Tynecastle Lane into a public convenience. The Burgh Engineer, City Chambers, Edinburgh.

HECKMONDWIKE.—Sept. 20.—For the erection of Heckmondwike school (builder, joiner, slater, plasterer, plumber, painter), whole or separate tenders, for the West Riding education committee. Deposit 1*l*. The West Riding Architect, County Hall, Wakefield.

HENLEY-ON-THAMES.—Sept. 20.—For additions and alterations to the engine and boiler house at the Lambridge Power Station, including boiler and engine foundations and setting for economiser. Mr. E. F. Pratt, borough surveyor, Henley.

HOLY ISLAND.—Sept. 20.—For the construction of a timber and corrugated steel lifeboat house and timber slip at "The Snook," Holy Island, Northumberland, for the committee of management of the Royal National Lifeboat Institution. Deposit 1*l*. Mr. W. T. Douglass, M.I.C.E., engineer and architect to the Royal National Lifeboat Institution, 15 Victoria Street, Westminster, London, S.E.

ILFRACOMBE.—Sept. 22.—For erection of business premises, The Promenade. Mr. Allen T. Hussell, F.R.I.B.A., Market Square, Ilfracombe.

IRELAND.—Sept. 20.—For the construction of a coal store, 100 feet by 25 feet, at Monaghan station. Charge 1*s*. Mr. W. H. Mills, engineer-in-chief, Great Northern Railway Company, Amiens Street Terminus, Dublin.

IRELAND.—Sept. 21.—For the erection of the Bangor new hospital. Deposit 2*l*. 2*s*. Messrs. Young & Mackenzie, Scottish Provident Buildings, Belfast.

IRELAND.—Sept. 22.—For enlarging and remodelling the Church of Our Lady of the Immaculate Conception, Newcastle, co. Down. Mr. J. J. M'Donnell, architect, 27 Chichester Street, Belfast.

IRELAND.—Sept. 23.—For additions and alterations to the stores of the Commissioners of Irish Lights, at Kingstown, Co. Dublin. Charge 10*s*. Mr. H. S. Cook, secretary, Irish Lights Office, Dublin.

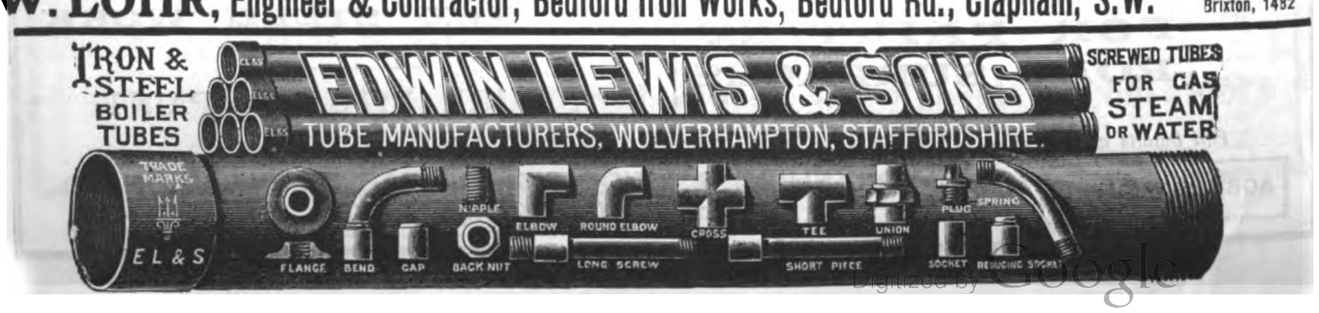
IRELAND.—Sept. 24.—For the erection of schools, Glasthale, Co. Dublin. Deposit 2*l*. 2*s*. Mr. J. P. Wrenn, M.R.I.A.I., architect, 16 Nassau Street, Dublin.

IRELAND.—Sept. 27.—The Secretary of State for War invites tenders for the following work:—Erection of twelve "A" married soldiers' quarters, Fermoy, Ireland. Deposit

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10*s.* 6*d.* Send names by September 17 to the Director of Barrack Construction, 80 Pall Mall, London, S.W., or to the Barrack Construction Office, Fermoy, Ireland.

LEEDS.—Sept. 23.—For any of the trades required in the erection of boys' and girls' departments at the Kirkstall Road Council school. The Education Department (architect's section), Calverley Street, Leeds.

LIGHTCLIFFE.—Sept. 18.—For the several works required in connection with the erection of two lodges and appurtenances, also motor garage. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

LONDON.—Sept. 22.—For carrying out certain decorations and repairs to the underground convenience at Gibbs Green, West Kensington, and the urinal at Putney Bridge; and also for carrying out certain alterations to wharf and additions to wharf-keeper's house at Swan Wharf, Putney Bridge. The Borough Engineer and Surveyor, Town Hall, Fulham.

LONDON.—Sept. 29.—For the erection of a public convenience in Avenue Gardens, Station Road, Wood Green, N. Deposit 1*l.* 1*s.* The Surveyor, Town Hall, Wood Green.

LONDON.—Oct. 4.—For the erection of two warrant officers' quarters, and three "A" and six "C" married soldiers' quarters (in flats), at Wellington Barracks. Deposit 10*s.* Send names by Sept. 26 to Director of Barrack Construction, 80 Pall Mall, London, S.W.

LONGTON.—Sept. 22.—For interior alterations at the Court House. Mr. J. W. Wardle, C.E., borough surveyor, Court House, Longton.

LOWESTOFT.—For the erection of certain alterations and additions to schools at Kessingland. Forward names to Mr. W. J. Roberts, architect, Lowestoft.

MAIDSTONE.—Sept. 23.—For the erection of an isolation hospital adjacent to Well Street. Deposit 1*l.* 1*s.* Messrs. Ruck & Smith, architects, 86 Week Street, Maidstone.

MIDDLETON.—Oct. 6.—For the erection of a secondary school in Rectory Street. Deposit 3*l.* Mr. Henry Littler, county architect, 6 Ribblesdale Place, Preston.

NEWARK.—Sept. 23.—For alterations to the town hall premises and for new offices, &c. The Borough Surveyor's Office, Town Hall, Newark.

PHILLEIGH.—Sept. 18.—For erection of a wain-house and alterations at Tolverne Farm, in the parish of Philleigh, Cornwall. Mr. George Gow, Tregothnan Office, Truro.

PORTLAND.—Sept. 27.—For alterations and additions at the King's Arms Hotel, Chiswell. Mr. S. Jackson, M.S.A., architect and surveyor, Bridge Chambers, Weymouth.

PORTSMOUTH.—Sept. 20.—For constructing and maintaining for six months alterations and additions to a corner of the basement floor of the town hall. The Borough Engineer's Office at the Town Hall.

READING.—Sept. 23.—For the demolition and removal of the existing premises, Nos. 26, 28 and 30 the Forbury, for the Berkshire County Council. Mr. J. F. Hawkins, county surveyor, Bank Chambers, Cross Street, Reading.

SCOTLAND.—Sept. 20.—For the works to be executed in the construction of new station buildings at Laurencekirk. Deposit 2*l.* 2*s.* The Caledonian Railway Company's Engineer, Buchanan Street Station, Glasgow.

SCOTLAND.—Sept. 21.—For (1) digger, mason, and brick works; (2) carpenter, joiner, and imonmongery works; (3) plumber work and gas-fittings; (4) slater work; (5) plaster work; (6) glazier work; (7) painter work; (8) furnishings, required in connection with the addition and alteration to Greenock Academy. Deposit 1*l.* 1*s.* Mr. A. F. Niven, clerk, Burgh School Board Offices, Municipal Buildings, Greenock.

SCOTLAND.—Oct. 1.—For the reconstruction and enlargement of the lifeboat house at St. Andrews, in the county of Fife, N.B., upon a site adjoining Woodburn Street, and the rocket apparatus house thereat. Deposit 1*l.* Mr. David W. Rusack, local hon. secretary, Marine Hotel, St. Andrews, or at the office of the engineer and architect to the Royal National Lifeboat Institution, Mr. W. T. Douglass, M.I.C.E., 15 Victoria Street, Westminster, London, S.W.

SELBY.—Sept. 30.—For the following work (whole or separate tenders):—Selby secondary school, additions and alterations (builder, joiner, slater, plasterer, plumber, painter), for the West Riding education committee. Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

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SMETHWICK.—Sept. 20.—For the erection of various buildings at the Corporation depot in Rolfe Street. Deposit 3*l*. 3*s*. Mr. C. J. Fox Allin, borough surveyor, Council House, Smethwick.

SPRINGFIELD.—Oct. 6.—For erection of an engine-house and supply of an oil-engine, pump, hose, &c., at the Sewage Farm, Brookend, Springfield, near Chelmsford, for the Chelmsford Urban and Rural District Councils. Borough Surveyor, 16 London Road, Chelmsford.

STANHOPE.—Sept. 20.—For erection of three stone bridges on the new road from Eastgate to Rookhope, for the Weardale Rural District Council. Deposit 1*l*. Mr. G. W. Eggleston, highway surveyor, Board Room, Stanhope.

ST. ANNE'S-ON-SEA.—Sept. 23.—For the erection of an elementary school to accommodate 310 scholars, for the Lancashire education committee. Deposit 2*l*. Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

ST. BREWARD.—Sept. 25.—For the erection of a china clay kiln, shed, tanks, &c., also for excavating for sidings at Penpont, St. Breward, Cornwall. Mr. T. H. Andrew, engineer, Market Hill, St. Austell.

TODDINGTON.—Oct. 7.—For the erection of a Council school at Toddington, Bedfordshire. Deposit 1*l*. 1*s*. Send names by Sept. 20 to Messrs. Gotch & Saunders, architects, 55 George Street, Luton.

TRURO.—For construction of ferro-concrete warehouse at Malpas Road. Send name and address to The Western Counties Agricultural Co-operative Association, Ltd., Millbay Road, Plymouth.

TUNBRIDGE WELLS.—Sept. 23.—For the extension of the post office. Deposit 1*l*. 1*s*. H.M. Office of Works, Storey's Gate, S.W.

WALES.—Sept. 18.—For erection of a county hall in the Cathays Park, Cardiff, upon foundations which have already been laid. Deposit 2*l*. 2*s*. Messrs. Harris & Moodie, architects, 8 New Square, Lincoln's Inn, London, W.C., and at the County Council Offices, Westgate Street, Cardiff.

WALES.—Sept. 20.—For erection of fourteen brick-built houses at Prendergast. The Borough Surveyor's Office, Council Chambers, Haverfordwest.

WALES.—Sept. 20.—For the following works, for the Glamorgan County Council:—(1) Additions to Council school at Porthcawl; (2) additions to Council school at Penybank, Gellygaer; (3) new laboratories, cloak-room, &c., at the County school, Bridgend; (4) alterations to Skewen Lower Council school, near Neath. Mr. T. Mansel Franklen, clerk of the County Council, Glamorgan County Council Offices, Westgate Street, Cardiff.

WALES.—Sept. 21.—For the erection of a Congregational chapel schoolroom at Loughor, also for a dwelling-house on the site adjoining. Mr. Daniel Francis, Ivydean, Loughor.

WALES.—Sept. 23.—For the erection of an electric power station on the eastern side of the Prince of Wales Dock Lock, for the Swansea Harbour Trustees. Mr. A. O. Schenk, M.I.C.E., Harbour Offices, Swansea.

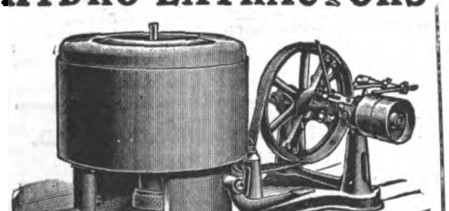
WALES.—Sept. 28.—For erecting vicarage at Moylgrove, Pembrokeshire. The Rev. E. P. Jones, B.A., Trefigin, Cardigan.

WALES.—Oct. 1.—For the carrying out of the following works:—(1) Erection of new school at Porth, to be known as "Islwyn school," with accommodation for 400 mixed and 400 infant scholars; (2) erection of two new departments at Penyrenglyn school, Treherbert, to accommodate 400 girls and 400 infants, for the Rhondda Urban District Council. Deposit 2*l*. 2*s*. in each case. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

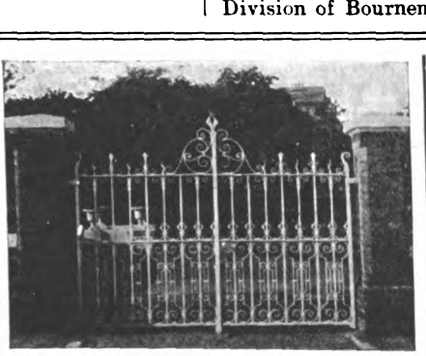
WINGATE, &c. (DURHAM).—Sept. 21.—(1) For erection of Wingate school (300 scholars). Mr. W. Rushworth, Shire Hall, Durham. (2) For erection of Cold Hesledon school (264 scholars). Mr. J. W. F. Phillipson, Murton Chambers, 8 Grainger Street, Newcastle-on-Tyne. (3) For alterations and additions to Dean Bank school. Mr. T. W. T. Richardson, 57 High Street, Stockton-on-Tees. (4) For alterations and additions to New Penshaw and Westwood Council schools (plans, specifications and general conditions only). Mr. F. E. Coates, Shire Hall, Durham.

IT is hoped this autumn to commence the work of erection, at a cost of 13,000*l*., of the new schools for the Winton Division of Bournemouth.

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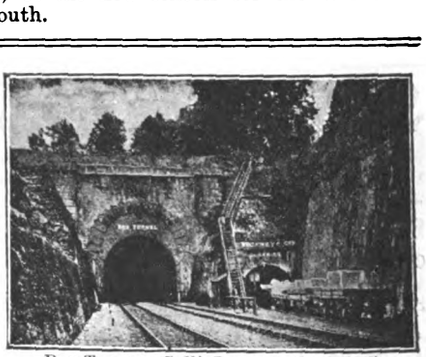


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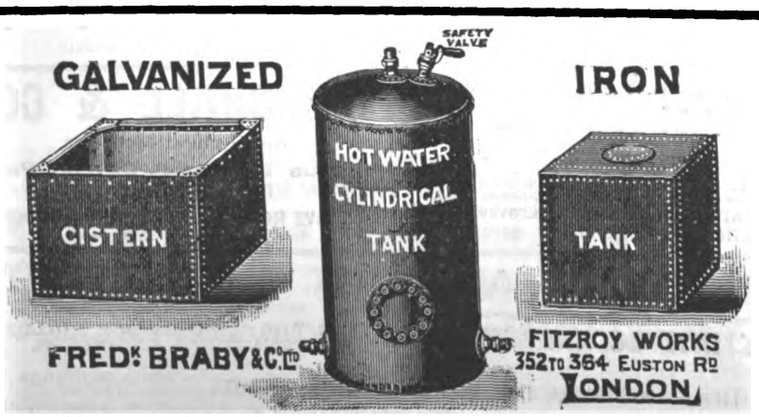
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MOSAIC—Cardiff University. Causeway Schls., Coventry. Maynooth College, Dublin.
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TENDERS.

ABERGAVENNY.

For extensions to girls' secondary school, Abergavenny. Mr. E. A. JOHNSON, architect, Abergavenny.

THOMAS & SONS, Abergavenny (*accepted*)	£1,789 0 0

ALMONDSBURY.

For alterations and additions to Almondsbury Pilning Council school, Gloucestershire.

Harris	£2,305 4 8
Lovell	2,114 0 0
Lewis	1,956 0 0
Browning	1,850 0 0
Lovell & Sons	1,813 0 0
Perkins & Sons	1,740 10 0
Hayes & Son	1,735 0 0
Stephens, Bastow & Co.	1,735 0 0
Preece	1,730 0 0
Slaughter	1,726 0 0
Clark & Sons	1,720 0 0
Love	1,705 0 0
Walters & Son	1,631 0 0
Orchard & Peer	1,579 0 0
Nicholls	1,564 0 0
Byard & Son	1,523 0 0
Adams & Jefferies	1,458 0 0
Heard, Bristol (*provisionally accepted*)	1,443 16 6

ALVESTON.

For the erection of a cottage. Mr. ALBERT H. CALLAWAY, architect and surveyor, Stratford-on-Avon.

Fincher & Co.	£385 10 0
Hirons	351 17 0
Cox	319 0 0
Price & Sons	317 0 0
Whateley & Sons	310 0 0
Kennard	298 0 0
HARRIS & SONS, Stratford-on-Avon (*accepted*)	290 0 0

BOXFORD (SUFFOLK).

For new farm buildings at Peyton Hall. Mr. S. ALLPRESS, surveyor, Sudbury.

Deaves	£535 0 0
Grimwood & Sons	524 0 0
KINGSBURY, Boxford (*accepted*)	519 0 0

BRADWELL-ON-SEA.

For rebuilding the Cricketers' Inn. Mr. RD. MAWHOOD, architect, Chelmsford.

Weight	£802 0 0
Eglin & Co.	780 9 0
Johnson & Hawkes	755 0 0
Allen & Gowers	717 0 0
RAYNER, E. Hanningfield (*accepted*)	655 10 0

BRIXHAM.

For the extension and completion of the breakwater. Messrs. WOLFE BARRY, consulting engineers, London.

HILL & Co., Westminster (*accepted*)	£20,025 0 0

CALVERLEY.

For erection of house (all trades except painter's). Mr. HORACE E. PRIESTLEY, architect, Bradford.

Accepted tenders.

Hanson, Fairburn & Sons, Wyke, excavator, mason and bricklayer	£227 0 0
Coates, Manningham, carpenter and joiner	89 8 0
Jeffrey, Calverley, plumber and glazier	44 7 0
Wheatley, Calverley, plasterer	24 10 0
Thompson, Stanningley, slater	16 10 0

CHURWELL.

For alterations and additions to three cottages, Millshaw. Mr. T. A. BUTTERY, F.I.A.S., architect, Morley, Yorks.

Accepted tenders.

Pullan, Beeston, mason	£246 0 0
Fergusson, Leeds, joiner	110 0 0
Hargreaves, Churwell, plumber	49 0 0
Barraclough & Rennison, Morley, plasterer	34 13 0
Richmond, Holbeck, slater	22 10 0

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Works: Radnor Works, Strawberry Vale, Twickenham.
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DARTFORD.

For the extension works at the Dartford Cottage Hospital.

Higgs & Hill	£4,964	0	0
Lonsdale	4,437	0	0
Knight	4,437	0	0
Ellingham	4,420	0	0
Thomas & Edge	4,300	0	0
Holliday & Greenwood	4,262	0	0
BLAY, Dartford (*accepted*)	4,088	0	0

EDINBURGH.

For the construction of a 4 feet diameter sewer 955 yards or thereby in length, for the Haymarket District.

Lawson & Son	£10,320	0	0
Dick	9,729	19	0
Finlayson & Son	9,048	17	0
Kinnear, Moodie & Co.	8,570	0	0
Brebner & Co.	7,946	10	0
Craik	7,850	16	6
Young	7,362	0	0
Mackay & Son	6,682	8	9
Alexander	5,968	0	0
Dobson	5,848	17	7
Topping	5,747	18	8
Jackson	5,442	15	0
Henderson & Duncan	4,879	19	9
Waddell & Son	4,850	0	0

ECCLES.

For erection of secondary and technical school at Park Road, Monton. Mr. HENRY LITTLER, county architect, Preston.

NICHOLSON & SON, Hunslet, Leeds (*accepted*)	£12,500	0	0

EXETER.

For the erection of a university college extension building and day training college. Messrs. TAIT & HARVEY, architects, Exeter.

WESTCOTT, AUSTIN & WHITE (*accepted*)	£14,678	0	0

Nineteen tenders were received.

HEYWOOD.

For new Primitive Methodist school. Messrs. J. D. & S. J. MOULD, architects, Bury, and 52 Queen Victoria Street, London.

Barker	£1,869	0	0
Twelves	1,860	0	0
PORTER, Bury (*accepted*)	1,687	0	0

ILKESTON.

For the erection of schools for the education committee.

EARNSHAW, Ilkeston (*accepted*)	£7,350	0	0

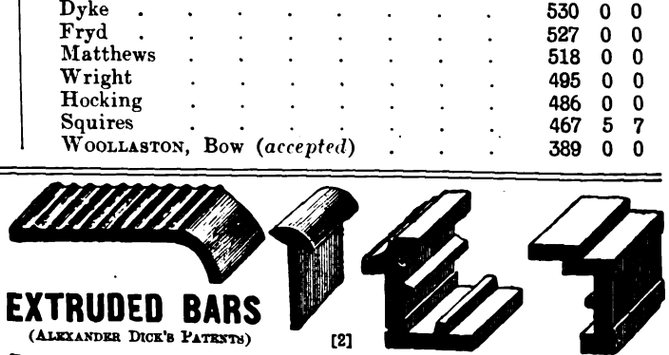
LONDON.

For painting and decorating the interior of the infirmary, for the Mile End Board of Guardians.

King & Barker	£1,088	0	0
Bull	977	0	0
City and West End Cleaning Co.	976	2	11
Lucas	890	0	0
Hubbard	835	10	0
Warman	780	18	5
Inns	735	0	0
Franks & Simons	732	3	6
Jackson	696	14	0
Chappell	651	12	5
Athey	600	2	2
Mossley	590	0	0
Daniel	580	8	6
Gunning & Son	569	16	5
Scott & Fenn	569	0	0
Hough	565	0	0
Stokes & Son	557	9	10
Root	557	5	0
Crook & Son	556	4	10
Young	550	10	0
Carney	539	0	0
Brown & Son	537	0	0
Dyke	530	0	0
Fryd	527	0	0
Matthews	518	0	0
Wright	495	0	0
Hocking	486	0	0
Squires	467	5	7
WOOLLASTON, Bow (*accepted*)	389	0	0

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LONDON—*continued.*

For the execution of the wood paving works in Malpas and Shardeloes Roads, for the Deptford Borough Council.

Wood paving works.

Dick, Kerr & Co.	£10,828 12 8
Homer & Co.	10,762 4 0
Starkey	10,762 4 0
Woodham & Sons	10,463 5 0
Smith	10,131 1 8
Anderson	9,965 0 0
Griffiths & Co.	9,566 8 0
Acme Flooring and Paving Co.	9,234 4 8
Fry Bros.	9,167 16 0
Mowlem & Co.	9,101 7 4
Improved Wood Pavement Co., 46 Queen Victoria Street (*recommended*)	8,669 11 0

Footway works.

Pearce	1,564 13 10
Improved Wood Pavement Co.	1,154 4 2
Griffiths & Co.	1,073 7 2
Starkey	994 17 7
Fry Bros.	991 10 2
Smith	899 15 5
Etheridge	878 9 2
Dick, Kerr & Co.	876 10 1
Anderson	859 9 6
Woodham & Sons	832 18 10
Mowlem & Co.	811 12 0
Wheeler & Co., 235 Blackfriars Road (*recommended*)	690 11 5

For the erection of a police section house at Beak Street, W. Mr. J. DIXON BUTLER, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard, S.W.

Higgs & Hill	£10,740 0 0
Ashby & Horner	10,653 0 0
Prestige & Co.	10,576 0 0
Lovatt	10,430 0 0
Mowlem & Co.	10,425 0 0
Leslie & Co.	10,295 0 0
Patman & Fotheringham	10,271 0 0
Appleby & Sons	10,247 0 0
F. & H. F. Higgs	10,196 0 0
Lole & Co.	10,099 0 0
Godson & Sons	10,027 0 0
Kilby & Gayford	9,936 0 0

LONDON—*continued.*

LUTON.

For reinforced concrete floors and a circular dome in connection with the new public library. Mr. S. F. L. Fox, A.M.I.C.E., borough engineer.

Lewis Rugg & Co.	£580 0 0

MIDDLETON (LANCS.).

For sewering works in Hollin Lane. Mr. W. WELBURN, borough surveyor.

Graham & Sons	£564 5 0
Edmonson & Whyatt	540 0 0
Randall	511 3 0
Stark & Son	497 15 1
Etheridge & Clark	474 8 0
Winter	458 7 11
Heard	429 16 8
PARTINGTON & SON (*accepted*)	427 0 6
Varley & Son	390 4 2

PONTYPRIDD.

For carrying out the following private street works in the urban district:—Contract No. 1, Fountain Street, Trehafod; (2) lane at the rear of Barry Terrace, Pwllgwaun; (3) Seaton Street, Pwllgwaun; and (4) lane at the rear of Berw Road. Mr. W. E. LOWE, engineer and surveyor.

Fountain Street.

POMERAY & Co., Cardiff (*accepted*)	£435 4 10

Barry Terrace.

COLLINS & Co. (*accepted*)	220 16 9

Seaton Street.

WEBB & SONS (*accepted*)	507 14 3

Berw Road.

MURRAY (*accepted*)	237 19 0

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NEWTON.

For the Moretonhampstead sewerage works.

PARKER & BRIMBLECOMBE (*accepted*)	£475 16 9

OSWESTRY.

For the construction of sewage disposal works.

THOMAS (*accepted*)	£5,150 0 0

RADCLIFFE.

For United Methodist church in Ainsworth Road. Messrs. J. D. & S. J. MOULD, architects, Bury, and 52 Queen Victoria Street, London.

Blomley & Co.	£2,880 0 0
Gibson & George	2,860 0 0
Allen	2,705 0 0
R. & T. Howarth	2,625 0 0
PORTER, Bury (*accepted*)	2,527 0 0

RYDE.

For the first part of the St. John's parish hall, Oakfield. Mr. GEORGE BOUGHTON, architect, Ryde.

T. & E. W. Jenkins	£697 10 0
Newnham	674 10 0
Williams	670 0 0
Ball & Son	648 0 0
Gallienne	605 0 0
Holland	600 0 0
Hayden	598 10 0
Wheeler Bros.	597 10 0
WHEELER & SONS, Ryde (*accepted*)	585 0 0
Adams & Mitchell	547 18 0
Attrill	516 12 0

ST. PAUL'S CRAY.

For additions to the Cray Valley Cottage Hospital, Kent. Mr. ST. PIERRE HARRIS, architect, 8 Laurence Pountney Hill, E.C., and Orpington.

Lowe & Co.	£2,400 0 0
Graty	2,377 0 0
Rider & Son	2,276 0 0
Knight	2,209 0 0
Blay	2,175 0 0
SOMERFORD & SON (*accepted*)	2,025 0 0

SANDBACH.

For alterations to Sandbach Heath Church of England schools. Messrs. ALFRED PRICE & SON, architects and surveyors, Sandbach.

Birchall Bros.	£520 0 0
Stringer	519 0 0
Jackson	502 5 0
Edwards	478 9 0
STREET, Sandbach Heath (*accepted*)	460 0 0

SOLIHULL.

For Lancashire boilers, steam and water mains, for the workhouse. Messrs. W. H. WARD, architects, Paradise Street, Birmingham.

Galloway	£1,562 0 0
Danks	1,185 0 0
Brightside Foundry and Engineering Co.	1,097 0 0
Parker, Winder & Achurch	1,097 0 0
Strode & Co.	1,075 0 0
H. & T. Danks	1,070 0 0
Taylor	1,068 0 0
Moorwood, Sons & Co.	1,067 0 0
THOMPSON, Wolverhampton (*accepted*)	1,045 0 0

THUNDERSLEY.

For rebuilding the Woodman's Arms. Mr. R. MAWHOOD, architect, Market Road, Chelmsford.

Choat & Son	£781 0 0
Rayner	719 0 0
Norden	685 0 0
Weight	648 0 0
Johnson & Hawkes	589 0 0
BAKER, Thundersley (*accepted*)	557 0 0

TUNSTALL.

For the erection of a pavilion at the Park.

PEMBERTON, Tunstall (*accepted*)	£1,238 10 0

WALES.

For alterations and additions at the Ely Workhouse, Cardiff. Mr. E. SEWARD, F.R.I.B.A., Queen Chambers, Cardiff.

ALLAN & SON (*accepted*)	£3,931 0 0

There were fourteen tenders.

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WEMBLEY.

For the construction of the Light Railway No. 1, Order 1907, Harrow Road, Wembley. County of Middlesex Light Railways (Extension and Lands) Order, 1907.

Manders	£33,104 19 11
Mowlem & Co.	29,852 0 0
Law	28,860 0 0
Dick, Kerr & Co.	28,611 6 1
Ford	28,611 6 1
Adams	28,397 12 4
Underwood Bros.	27,764 5 5
Holloway	27,439 9 5
Wall	27,280 0 0
WIMPEY & Co. (*accepted*)	27,132 0 0

WOOLWICH.

For erection of open-air wards at the infirmary, Plumstead, for the Guardians of Woolwich Union. Messrs. CHURCH, QUICK & WHINCOP, architects, Woolwich.

Mills	£1,655 0 0
Gunning	1,596 0 0
Moss	1,546 17 6
Proctor	1,537 0 0
Holloway	1,483 0 0
Douglass	1,480 11 0
Stephens & Son	1,419 0 0
Nightingale	1,408 0 0
Harris	1,405 0 0
Thomas & Edge	1,383 0 0
Hyde & Co.	1,361 10 0
Gathercole Bros.	1,355 0 0
Battley, Son & Holness	1,345 10 0
Ware	1,343 0 0
Jerram	1,341 0 0
Multon & Wallis	1,341 0 0
Kent	1,340 0 0
Sanford & Co.	1,332 0 0
F. & G. FOSTER, Norwood Junction (*accepted*)	1,224 0 0

WEST WINCH.

For erecting a house at West Winch. Messrs. W. JARVIS & SON, architects, Paradise Parade, Lynn.

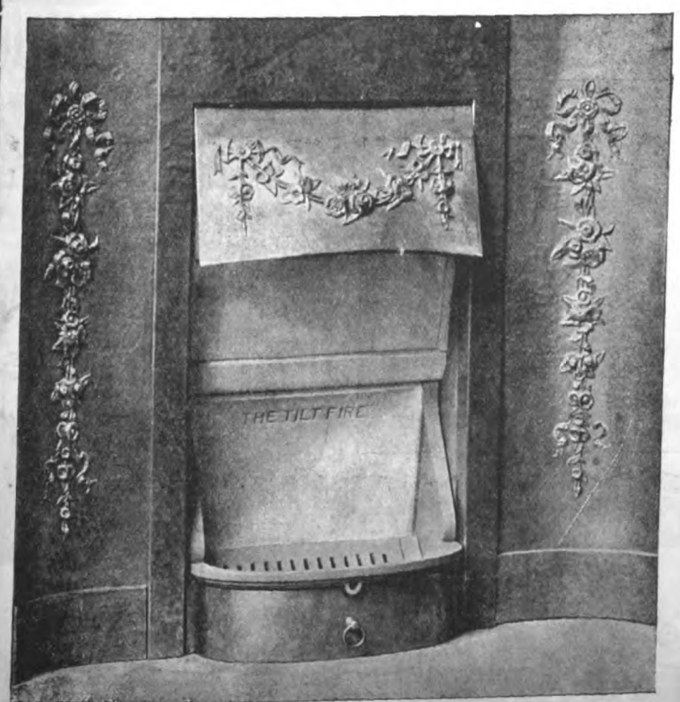
Cater & Co.	£430 17 0
F. & S. Dickerson	375 0 8
Medwell	367 10 0
Ives & Sons	360 3 0
Ashby	360 0 0
Barnes & Co.	344 0 0
Hampton	342 8 6
Pitcher	338 19 0
Reeder	335 0 0
Hall & Lawson	327 12 1
Anderson	317 4 0
WHITE, Lynn (*accepted*)	272 18 11

NEW CATALOGUE.

ALMOST if not quite the first form of glazing to supersede in skylight roofing the old unsatisfactory method of bedding the glass in putty was introduced more than a quarter of a century ago by Messrs. William Edgcumbe Rendle & Co., The form then devised has ben improved repeatedly, and now Rendle's "Invincible" system of glazing is, despite the efforts of numerous competitors, as good as, if not better, than any other. In the first place it is simple, in the next it is effective in excluding rain, and, though thus effective, makes provision for carrying off any water that might penetrate by reason of imperfect fixing or other trivial cause, as well as for any resulting from condensation of the internal atmosphere. Expansion and contraction of the glass or metal are also adequately provided for. Needless to say, Rendle's "Invincible" glazing has been extensively and successfully used in many important buildings, some of which are illustrated in Messrs. Rendle's latest catalogue. Two fine specimens of their latest work may be seen in London at Victoria Station, L.B. & S.C. Ry., and Waterloo Station, L. & S.W. Ry. The combined area of these roofs, when finished, will amount to nearly one million feet superficial. From an architectural point of view a more artistic piece of work will be that carried out by Messrs. Rendle of the roofs, galleries, and domes of the Victoria and Albert Museum, South Kensington.

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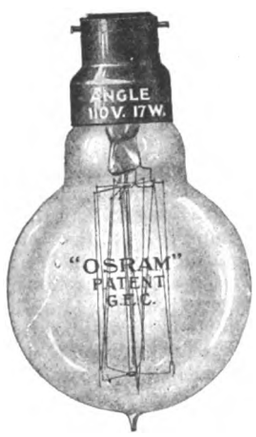
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TRADE NOTES.

UNDER the direction of Mr. C. A. Downton, architect, Kidderminster, the "Boyle" system of natural ventilation, embracing the latest patent "air-pump" ventilators and air inlets, has been applied to Stourbridge School.

MR. WILLIAM BALDWIN, foreign representative, the Paraffine Paint Company, San Francisco, manufacturers of "Malthoid" and kindred building material, is due to arrive on September 16, per s.s. *Prinz Ludwig*, after an extended tour in the Orient.

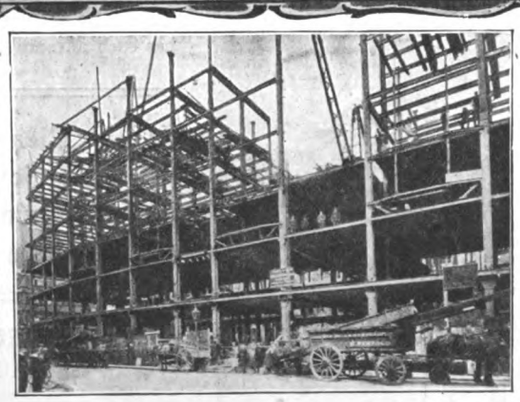
THE General Electric Light Co., Ltd., 71 Queen Victoria Street, E.C., have undermined one of the few remaining objections to the use of electric light in small-sized houses, for their 17 watt Osram lamp is rated at approximate 16 h.c.p. and is calculated to give 20 hours' light for a penny.



The 40 watt (approximate 32 h.c.p.) Osram lamp gives twenty-five hours' light for the consumption of one unit of current. The lamp has an average life of over 2,000 hours, and during the whole of that period its initial candle-power is practically undiminished. The initial cost is higher than that of the ordinary carbon lamp, but this is amply counterbalanced by the saving on the current and durability. Our illustration shows the latest type of lamp, but it is also made in spherical form.

THE Associated Portland Cement Manufacturers (1900), Ltd., have issued their statement of accounts, which will be presented at their tenth ordinary general meeting on Thursday next. The directors recommend the payment of a final dividend on the preference shares to June 30, 1909, at the rate of 5½ per cent. per annum. The directors recommend that, as in previous years, a sum of 25,000*l.* be carried to the general reserve and depreciation account, bringing that account to 195,000*l.* The total charge for the year for sinking funds, depreciation and reserve (including the amount written off patents and the reserve for bad and doubtful debts) will then amount to 61,065*l.* 13*s.* 8*d.* The directors consider that in view of the condition of the building trade the year's trading is satisfactory. The selling price of Portland cement is substantially less than the cost of production a few years ago. The main factor which has enabled the company to earn approximately the same margin of profit on its output as heretofore is the reduction in manufacturing cost brought about by a very considerable outlay of capital upon its principal works. There should accrue during the current year a fuller economy from all this expenditure than has yet been realised.

In the brief description which was given last week of our illustration showing the large dining-room, Central Station Hotel, Glasgow, it was erroneously said that the marble work was carried out by Messrs. OSCAR PATERSON & Co., of Glasgow. This firm were responsible for certain decorative glasswork, as in the dome of the lounge. The contractors for all the marble work, which forms so prominent a feature of the additions to the hotel, should have been given as Messrs. GALBRAITH & WINTON, 185 St. Vincent Street, Glasgow, contractors for all kinds of constructive and decorative work in British and foreign marbles and alabaster.

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Office & Works: Trafford Park.
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ILLUSTRATIONS.

NEW WEST WING, TEMPLE DINSLEY, HERTS.

SELECTED DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

BUILDING AND BUILDERS.

MR. HAROLD S. SCOTT, architect and surveyor, 44 Waterloo Street, Birmingham, has been appointed architect for a vicarage to be erected at Skelmanthorpe, near Huddersfield, and has now got the plans in hand.

AN American theatrical syndicate are said to be about to erect large theatres at Fairfield, near Liverpool, Bootle, Birmingham and Nottingham. Negotiations are being carried on for sites in the last three towns, and have been completed in the case of Fairfield.

SWANSEA Board of Guardians have written to the Corporation, asking upon what terms a loan of 2,300*l.* could be arranged for additions to the workhouse. The Town Council will be recommended to offer the Guardians the loan of the money from the sinking fund at 3¾ per cent. interest.

MR. C. F. WIKE, the city surveyor of Sheffield, has prepared a scheme for an important street improvement whereby a thoroughfare 70 feet in width would be cut from Castle Street through a big block of low-class property to the Great Central Railway station. The building sites thus created would be all on Corporation land.

NANTWICH Urban Council have approved the terms arranged with Lord Crewe, by which Nantwich will acquire a new source of water supply from the neighbourhood of Wrinehill. Boring operations will be necessary. The cost will be 15,000*l.* The present supply at Baddiley, near Nantwich, has been condemned as being deficient in quantity and quality.

THE Glamorgan County education committee have decided in regard to the proposed training college for girls to be erected at Barry that accommodation shall be provided for 130 residential and twenty non-residential students, with the usual rooms for professors, &c. Originally it was intended that a college should only be provided for 100 students.

THE streets and buildings committee of Edinburgh Town Council on Friday considered an application by the Charlotte Baptist Chapel for permission to increase the height of their church in West Rose Street. The intention is to take down the present building and erect a new chapel. Rose Street is at present 30 feet in breadth, and it is proposed to increase the building to a height of 54 feet, being 24 feet in excess of the regulation height. This was opposed by adjoining proprietors, and the committee agreed to visit the site before coming to a decision.

AT a sitting of the Troon Dean of Guild Court on Monday petitions were presented and passed for the erection of property valued at 5,300*l.* as follows:—Provost Logan, tenement in Portland Street, estimated cost, 850*l.*; Messrs. M. Muir & Co., double villa in Harling Drive, estimated cost, 1,400*l.*; Mr. Gilbert Smith, double villa in Harling Drive, estimated cost, 1,400*l.*; Mr. Hugh Shaw, double villa in Harling Drive, estimated cost, 1,300*l.*; Mr. George Symington, Windyhaugh, for alterations and additions, estimated cost, 350*l.*

THE West Hartlepool Town Council are considering what prompt measures can be taken to put an end to the wholesale looting of empty houses in the town. In some instances little more than the shell of a house is left, flooring boards being ripped up, doors broken, and even staircases and fireplaces removed almost bodily. Windows, unless immediately boarded up on a tenant leaving, are riddled with stones, and even when houses are boarded up the boards are not infrequently pulled down.

MR. CHARLES CURTIS GRAY, surveyor to the Scunthorpe Urban Council, was charged at Scunthorpe with obstructing the highway by placing trestles with poles across and not having them lighted. The road was under repair at the time. Mr. Gray admitted that the lamps were not lit, and said the man to whom instructions had been given had failed to carry them out. He thought it was rather frivolous. The Chairman said they were sorry to have to fine Mr. Gray for the fault of a workman, but they could not see their way to let him off. Fined 5*s.* and costs.

THE plans committee of the Lower Ward of Lanark at their last meeting disposed of the following plans of new

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buildings, etc.:—Robert Chapman, Coatbridge, alteration of dwelling-house on Chryston Road, Chryston; Shettleston Free Church, new church at corner of Wellshot Road, Shettleston; Thomas Begg, Glasgow, tenements corner of Wellshot Road and Woodend Place, Shettleston; George Nicoll, Chryston, cottages, Cumbernauld Road at Mollinburn; E. Roslyn Mitchell, Cambuslang, alteration of cottage, Hamilton Drive, Shettleston; J. A. Dixon Erskine, Glasgow, villa, Victoria Road, Lenzie.

THE Stockport Guardians have decided to build a one-storey brick sanatorium for twenty-four patients at Stepping Hill. The building is to comprise a central day or mess room, 32 feet long and 16 feet wide, with a nurses' kitchen attached. At each side of the day room is to be a ward to hold twelve beds, and on the southerly side of each ward an open verandah. The estimated cost of the building is about 80*l.* per bed, or a total of 1,920*l.*

THERE were twenty-three petitions before the Edinburgh Dean of Guild Court on the 9th inst. Six warrants were granted, including one to St. Cuthbert's Co-operative Association, Ltd., for the erection of a cattle depôt at Gorgie. The depôt will be to the north of the new slaughter-houses, and will extend to 180 feet by 150 feet. The building will contain stores for cattle and sheep, cooling rooms, despatch rooms, stables, and sheds for killing. The Lord Dean of Guild said he was very pleased to see the Association come forward with such a high-class building for a cattle shed.

ACCORDING to the thirty-fourth annual report of the Public Works Loan Board, the Commissioners during the financial year 1908-9 made 969 advances for sums amounting together to 2,714,068*l.* This amount includes the sum of 85,442*l.* advanced for providing dwellings for working classes. Among the bodies to whom loans were advanced were 4,150*l.* to the Fallings Park Garden Suburb Tenants, Ltd., 7,010*l.* to the Hampstead Tenants, Ltd., 2,277*l.* to the Garden City Tenants, Ltd., 18,335*l.* to the Harborne Tenants, Ltd., 13,396*l.* to the Ealing Tenants, Ltd., 5,500*l.* to the Letchworth Cottages and Buildings, Ltd., 8,907*l.* to the Manchester Tenants, Ltd., 1,122*l.* to the Fairfield Building Club, and 2,145*l.* to the Bedlinog Workmen's Building Club.

VARIETIES.

A PARISH hall is to be provided at Mill Hill, Hendon, at a cost of over 2,000*l.*, as a memorial to the late vicar.

APPLICATION is to be made by the Gillingham Town Council for a loan of 2,650*l.* for the extension of the Technical Institute.

THE third International Congress and Exhibition of School Hygiene has been postponed at the instance of the French organising committee until August 2 to 7 of next year.

THE Wakefield education committee on Tuesday decided that application be made to the City Council for authority to purchase a site (4 acres) in Lawefield Lane at a cost of 1,500*l.* for an elementary school.

MESSRS. J. CHEAL & SONS, landscape gardeners, of Crawley and 53 Victoria Street, Westminster, have sent us a copy of the pamphlet they are just issuing, entitled "All for the Garden." Messrs. Cheal's nurseries have been so extended that they now cover 113 acres of ground.

THE Illuminating Engineering Society opens its first session in November, under the presidency of Professor S. P. Thompson, D.Sc., F.R.S. A representative Council has been formed, with Mr. L. Gaster, 32 Victoria Street, S.W., as honorary secretary.

A SCHEME has been set on foot in South Shields for the establishment of new free library buildings more in keeping with the size and importance of the borough than the existing premises in Ocean Road. Mr. A. Carnegie is to be approached with a view to obtaining the necessary funds.

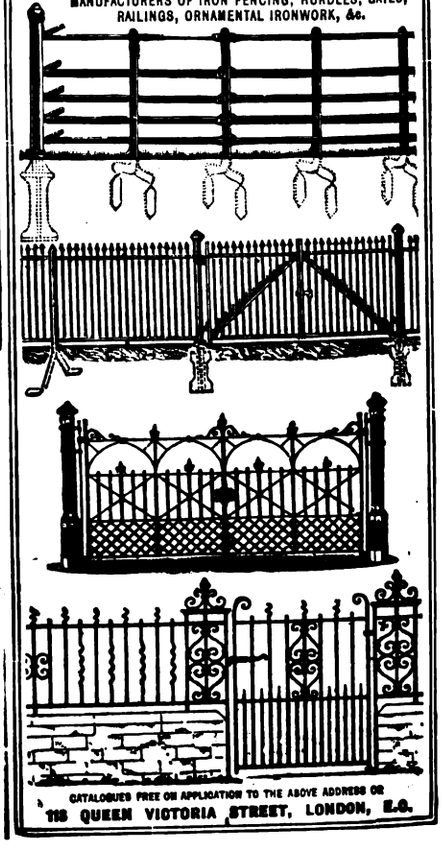
ST. LUKE'S CHURCH, Bath, is to be considerably enlarged to meet the rapid development of the neighbourhood since the present structure was opened in 1868. The vicar (Rev. C. E. Doudney) is to call a meeting to appoint an architect to carry out the work. The cost is expected to be 5,000*l.*

THE annual meeting of the Sanitary Inspectors' Association, North-Eastern Centre, was held in the town hall, Sheffield, on Saturday last. By the invitation of Messrs. Newton, Chambers & Co., Thorncliffe Ironworks, near Sheffield, manufacturers of "Izol" disinfectant, the various processes were succinctly explained and the members were entertained to luncheon by the firm. Mr. R. Allison, Huddersfield, was subsequently elected honorary secretary.

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"ALONG THE GREAT WALL OF CHINA" forms the subject of an interesting and well-illustrated article by Dr. Geil, F.R.G.S., in *Harper's Magazine* for this month, which also contains a graphic description of the town of Barga, in Italy, with etchings by B. J. O. Nordenfeldt.

MESSRS. RAPHAEL TUCK & SONS, LTD., the well-known fine art publishers, have forwarded us specimen boxes of their latest novelty, "Picture Puzzle Postcards," which are adapted to form a pleasant pastime and sociable recreation for the long evenings of autumn and winter. The numerous sets issued comprise a large range of important and picturesque designs.

AT the last meeting of the Cheltenham Town Council the town clerk announced that the Leslie Young trustees had set aside 1,000*l.* for the Public Library and 1,000*l.* for the Art Gallery and Museum. An intimation that the Royal Institute of Public Health would be pleased to hold their 1910 congress in Cheltenham was referred to the general purposes committee.

THE Council of the Society of Engineers instituted a prize to be awarded for five years for the best essay on "How to Improve the Status of Engineers and Engineering, with Special Reference to Consulting Engineers." As a result of the first year's competition Mr. G. Allan Thomas, M.C.M.E.S., has been awarded the prize, and he will read his essay at the meeting of the society on October 4, at Caxton Hall, Westminster.

AT a meeting of the Derby Board of Guardians on Tuesday afternoon a sequel to the recent controversy in reference to the method under which specifications and quantities have been prepared and supplied was furnished in the report of the special purposes committee, who suggested that all copies of specifications and quantities should be obtained from the same impression, so that each might be identical, and that a copy thereof should be placed in the clerk's office for general inspection. The Board approved of this course.

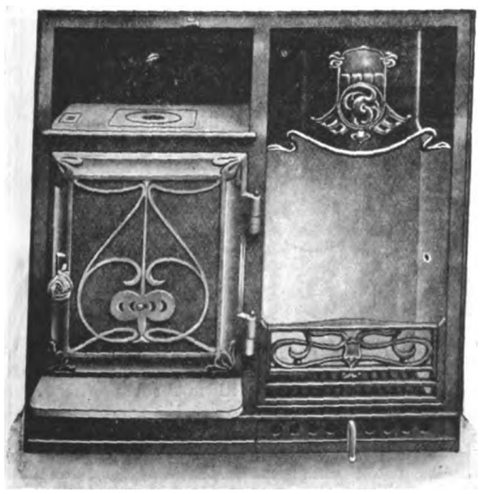
A MODEL of the statue by Mr. F. W. Pomeroy, A.R.A., which is to constitute the town's memorial of the late Lord Burton, was on view at the town hall, Burton-on-Trent, last week. The proposed memorial is to consist of a pedestal of grey Scotch or Cornish granite 12 feet high, surmounted by a bronze statue of Lord Burton 9 feet in height, representing the late peer in his baron's Coronation robes over his uniform as hon. colonel of the old 2nd North Staffordshire Volunteers. Mr. Pomeroy was authorised to proceed with the erection of the statue.

PADDINGTON Railway Station is to be enlarged by the addition of three additional roads and platforms on the Bishop's Road side. The design adopted for the new roof is identical with that over the existing platforms, which is of the arch type, the main span being 60 feet from rail level. It is intended that the subway giving access to the different platforms, which extends from No. 1 to No. 8 platforms, shall be carried under the new lines. The present exterior wall of the station will have to be underpinned and dropped to a lower level. This preparatory work will occupy twelve months. The enlargement scheme is being carried out under the superintendence of Mr. W. Armstrong, engineer for new works to the Great Western Railway, Mr. J. C. Wright acting as resident engineer.

MR. HENRY J. WILSON recently asked the President of the Local Government Board whether his attention had been drawn to the fact that during the last eight years the Coal Smoke Abatement Society had made 3,222 complaints to the West Ham Corporation of the emission of black smoke from the factories within the area of the Corporation without that authority taking legal action in any instance. Mr. John Burns replied as follows:—"I am aware that the society has made numerous complaints to the Town Council on this subject. The latter have, I understand, served a number of notices calling for abatement of the nuisance; but I do not gather that they have proceeded for penalties before the justices. The Local Government Board have, from time to time, brought this matter before the notice of the Town Council. The Board are not empowered to take upon themselves the powers and duties of a local authority who have made default in relation to nuisances under the Public Health Act, 1875, but they could authorise an officer of police acting in the district to institute proceedings if the default of the authority was proved to their satisfaction. Any officer so appointed, however, would have no greater power to take action than is conferred by the Act on any person aggrieved by the nuisance, or any inhabitant of the district, or any owner of premises within it."

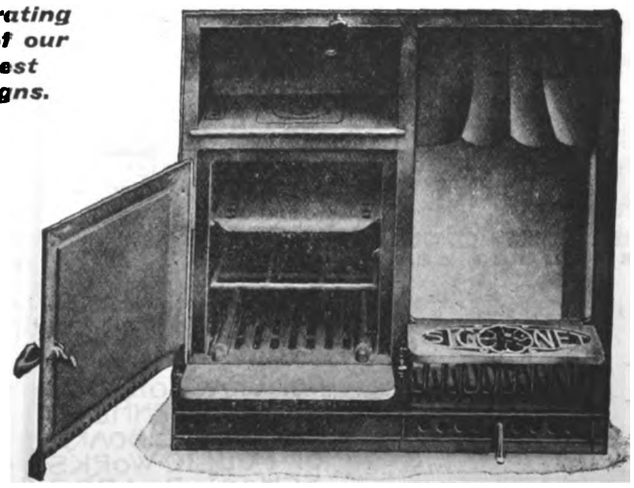
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STRAND PALACE HOTEL.

THIS recent addition to the hotels of London has been erected upon the sites of the old Exeter Hall and St. Michael's Church adjoining, occupying an area of 20,000 square feet. The site has frontages to four streets.

The façades of the building are faced with Doulton's Carrara ware, and the roofs covered with green Westmoreland slates.

The main entrance is in the Strand, and leads into a lounge which runs through to the winter garden. Owing to the enormous traffic in the Strand the arrival and departure door has been placed in Exeter Street, W., with a luggage entrance, receiving room, and lift adjoining. Between this entrance and the lounge is the booking and inquiry bureau. The staff and goods entrance is situated on the eastern side of the hotel in Burleigh Street.

On the ground floor there is a fine winter garden 130 feet long by an average width of 35 feet. It has two glazed domes each 30 feet in diameter, above which are square courts running the whole height of the building and affording light and air to the interior bedrooms. These courts are connected with the streets by means of ducts immediately below the second floor, and a constant current of air will thus be obtained. From the winter garden the main dining hall 94 feet by 59 feet, drawing room 40 feet by 31 feet, and writing room 16 feet by 31 feet are reached.

A large portion of the basement is devoted to the grill room, the smoking room, and the billiard room. The grill room, situated under the winter garden, is reached by a double stair from the Strand entrance hall, and from the winter garden by a staircase and passenger lift. It can accommodate 800 diners simultaneously. The rest of the basement is occupied by toilet rooms, kitchen, larders, cellars, service staff, engine and boiler rooms.

On the nine upper floors 470 double and single bedrooms have been provided, each containing a marble washstand fitted with hot and cold water.

Each floor is served by a separate express food service lift, two passenger, one staff, and one luggage lift.

The storage water tanks and water softening plant are in the roof, which is of the Mansard type.

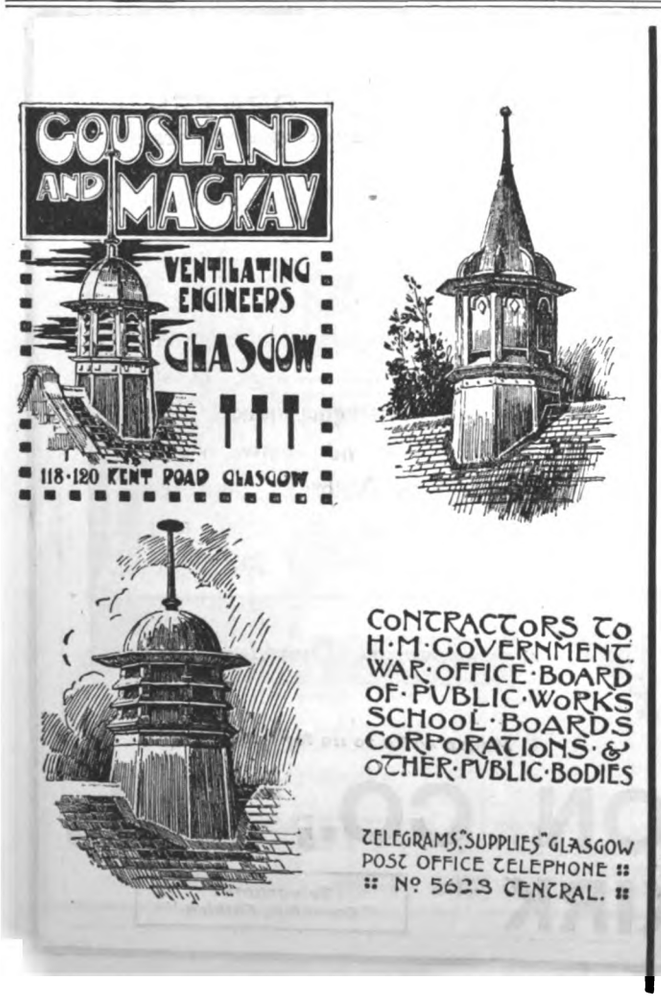
The general system of heating and ventilation throughout the ground floor and basement of the hotel is the Plenum. The corridors on the bedroom floors are warmed by hot-water radiators. A large vitiated air shaft 6 feet square, with electric exhaust fan at top, forms part of each block of lavatory accommodation, and is so designed as to prevent the escape of any vitiated air into the corridors.

The architect is Mr. W. J. Ancell, of 3 Staple Inn, W.C., with Mr. H. Tanner, jun., F.R.I.B.A., of 12 Regent Street, S.W., coadjutant.

The general contractors for the building were Messrs. Leslie & Co., Ltd., of Kensington Square, W. The following were some of the principal sub-contractors:—

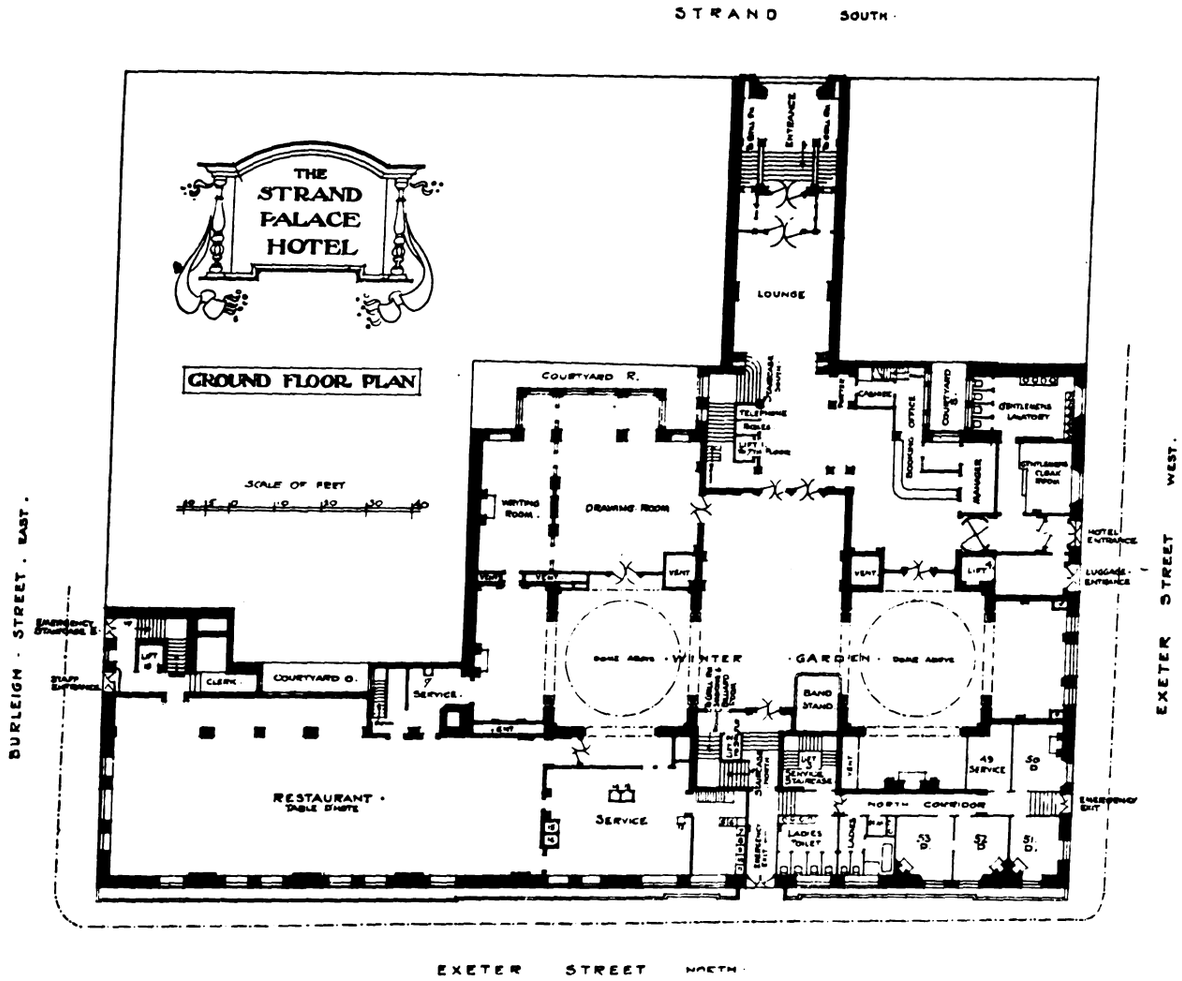
Steelwork, Dorman, Long & Co.; heating and ventilation, J. Jeffreys & Co.; electric light wiring, Strode & Co.; marble work, H. & T. Jenkins, Garston Frères, of Belgium; decorative plaster work, the Bromsgrove Guild, Campbell, Smith & Co.; general plaster work, Wheater & Son; lead glazing, the Bromsgrove Guild; shelters, the Bromsgrove Guild, Jones & Willis; staircase enclosures, Jones & Willis; lifts (electric and hydraulic), Waygood & Co., Ltd.; stoves, Albion Iron Co., Messrs. Elsley; Carrara ware, Doulton & Co.; furniture, the Bath Cabinet Makers; mosaic paving, Diespeker, Ltd., the Art Pavements and Decorations Co., Ltd.; sanitary fittings, Doulton & Co.; lightning conductors, G. W. Gray & Son; electric light fittings, Strode & Co., General Electric Co., Burt & Co.; hydrants and water supply, Mather & Platt; ironmongery, Gibbons, Carter & Aynesley, Bromsgrove Guild; wall tiling, Wooliscroft; roof glazing, the Standard Glazing Co., Ltd.; plumbing, Dent & Hellyer; domes to winter garden, the Bromsgrove Guild; ground-floor doors, the Bromsgrove Guild; revolving door, S. Elliott & Co., Reading.

The building is up-to-date in every detail, and in none more so than in its system of lifts, which was installed by Messrs. R. Waygood & Co., Ltd., London. There are two main passenger lifts, each capable of carrying a load of 10 cwts., or seven persons, at a speed of 300 feet per minute. They are specially designed for smooth running at high speed, and with special controlling arrangement so that they can be started and stopped with smoothness and accuracy at the various levels. One of these lifts is worked by hydraulic power from





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the high-pressure main of the London Hydraulic Power Company, and the other one by electric power, the latter being arranged with winding gear and special electrical control with car switch in the cage. Special electrical indicators are also fitted on each lift showing the position of each at every floor by means of ornamental fitting with electric light. The guides run on round steel runners so as to give the smoothest possible travel. The cages are handsomely finished and decorated, and are provided with special safety apparatus to prevent the descent of cage in case of suspension ropes failing, also safety appliances to guard against over travel in either direction.

There are two goods lifts travelling up through the building, one operated by hydraulic power, and capable of carrying loads of 15 and 20 cwts., and one direct acting platform lift from basement to ground floor.

There is a very complete installation of electric service lifts—fifteen in number—serving the various floors and operated by push-button control with automatic stopping at each end of travel. There are also three small hand-power lifts for carrying wine and papers respectively.

One of the most interesting structural novelties is the "Anti-Cyclone" (two-way) door—Samuel Elliotts' patent—supplied by the Gilmour Door Company. No doubt many of our readers will remember having seen it at the recent Building Trades Exhibition, where it aroused considerable attention. It differs in some important respects from the ordinary revolving door. In the first place the usual four sections are reduced to two by the elimination of one pair of cross-doors. The wings always return to the sides when the door is at rest, so giving the appearance of the customary swing-to doors. But of greater importance is the fact that the two central or diametre doors open on a very slight pressure from within, and, fitting against the sides, leave an unimpeded passage for the crowd to pass through. The fact that the door has been fitted in the Strand Palace Hotel is proof that it meets the stringent requirements of the London County Council as to fire exit doors.

Messrs. Doulton & Co., Ltd., supplied all the sanitary fittings. A special feature is that a lavatory basin fitted with hot and cold water is fixed in each bedroom. These basins are in polished Jaune Lamartine marble, with nickel-plated legs. There is also a nickel-plated towel rail fitted with a glass shelf, etc. The baths are made of cast iron white porcelain enamelled inside and outside, with nickel-plated fittings. The w.c.s are the pedestal type; the cistern, flush-pipe, and pan are all in white glazed ware. The lavatories for public rooms are in Dove marble with waste of special design. The urinals and the sinks are in Doulton's special white glazed vulcanware.

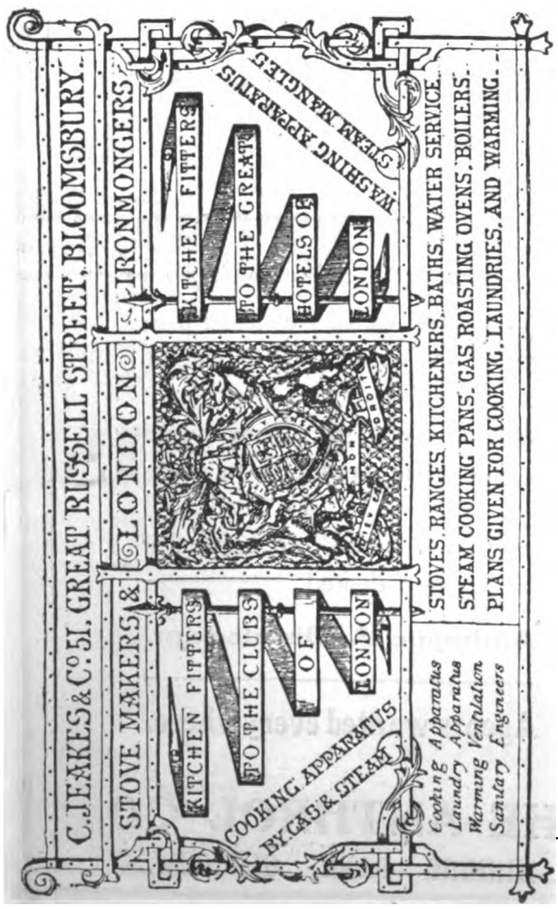
THE plans for a new theatre to be erected in High Street, Leek, which were submitted by Messrs. Williams & Co., have just been approved by the local authority.

MESSRS. LONGLEY & Co., Crawley, have received the contract from the London and Brighton Railway Company for the reconstruction of Worthing Station.

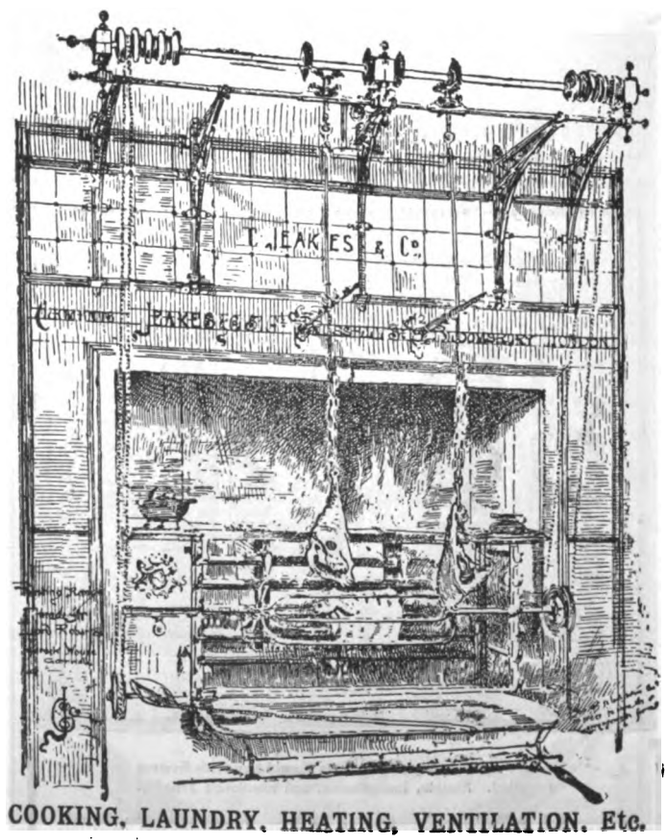
THE Sheffield Master Builders' Association at their monthly meeting last week presented to Mr. A. Mastin a handsome carved oak Westminster chime-clock, in recognition of his valuable services as treasurer of the association for a period of ten years.

THE Tynemouth Town Council are recommended to expend 6,000*l.* on the provision of larger mains and feeds for the improvement of the supply of water to Whitley and Monkseaton. A report has been prepared by Mr. J. F. Smillie, the borough surveyor.

MR. AUSTEN CHAMBERLAIN, M.P., has replied as follows to a letter from the Institute of Clay Workers setting forth the injustice of treating common brick clay as a mineral for the purpose of the Finance Bill:—"I share your objection to the Chancellor's latest tax on British industry. Not only is the clay worked by you to be taxed, but your coal will also have been taxed, and thus a double burden is to be placed on raw materials. Other industries are equally affected in their raw materials, and thus the cost of home manufactures is to be raised, whilst the foreigner is encouraged to send his productions into this country free of tax to compete with British labour and capital. This is the final triumph of Free Trade finance. I shall certainly do my best to defeat these monstrous proposals. Tariff Reform offers a better way of raising the necessary revenue and at the same time assisting British industry instead of fining it."



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PUBLIC WORKS AT HAMBURG.

THE Hamburg Government is, according to the last report of the British Consul, indefatigable in its efforts towards improving and enlarging the accommodation and arrangements of its already very extensive harbour, so that it may keep pace with the annually increasing amount of shipping visiting this port as well as with the increased dimensions of the majority of steam vessels which trade between this and other parts of the world.

Amongst other works the extension of the quays and harbours built for and leased to the Hamburg-American Line is contemplated, and in the meantime provisional accommodation is to be provided for the rapidly growing fleet of this company in the vicinity of the Kuhwärder Harbour. Two large new suction dredgers are about to be purchased by the State of Hamburg for dredging work in the River Elbe. It is further intended to construct additional extensive shelters for the dock labourers upon the same system as those already in use, which serve more especially for workmen taking their meals in bad weather.

According to the Hamburg State Budget for 1909, the total sum to be set aside for the maintenance and improvement of the port during the present year is about 742,750*l*. Of this amount 270,200*l*. are for ordinary and 472,550*l*. for extraordinary expenses. Amongst the latter are comprised 160,000*l*. for continuing the construction of the tunnel underneath the Elbe, 185,000*l*. for building two new large quay sheds, and 35,000*l*. for two smaller quay sheds. For the completion of the new landing stages a sum of 47,500*l*. is required. In the amount set aside for the ordinary expenses is included a sum of 22,850*l*. for the outport of Cuxhaven.

The Elbe tunnel, which was commenced in 1906, will probably be finished in the year 1911; the total cost will probably exceed 400,000*l*.

Other public works of considerable importance (apart from those connected with the port of Hamburg already referred to) are at present being carried on in this town; among these is the construction of a circular and suburban railway, partly underground and partly elevated, intended more especially for the benefit of the industrial classes, who will thus be able to reach their dwellings in distant suburbs quickly at a cheap rate.

These works have necessitated the demolition of a very large number of streets and houses in some of the most densely inhabited parts of the town, but their disappearance will no doubt contribute towards making the town more healthy, and several fine wide streets will take the place of the old narrow ones which have disappeared.

The erection of almost palatial buildings for business offices in all parts of the town of Hamburg, which commenced about ten years ago, still continues undiminished, and has, it may almost be said, given a special feature to the business quarter of the town. It is, moreover, a characteristic of these office buildings that almost everyone shows a distinctive architectural style.

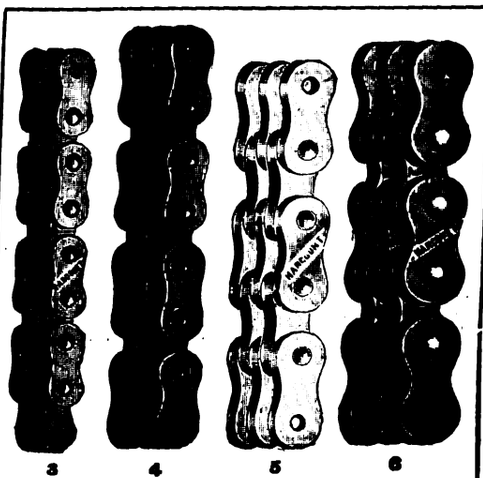
In another part of his report, in speaking of the British Patent Laws, he says the provision of the British Patent Law of 1907 obliging the owners of British patents who live outside the United Kingdom to work the patent in that country to a certain extent has caused a good deal of dissatisfaction in this and other parts of Germany. The Hamburg Chamber of Commerce considers it very regrettable that the German Government was unable before the new Patent Law came into force to conclude an agreement with the United Kingdom of the same nature as that concluded with Switzerland and Italy concerning the working of patents. The Hamburg Chamber of Commerce, however, points out that in Germany, where similar legal provisions as to the working of patents have existed for some time, but have so far been put into force only in a very lenient manner, this will perhaps in future not continue to be the case, if the British law in question should be actually carried out in a rigorous way.

DEVELOPMENT BILL AND OPEN SPACES.

THE following is a copy of a communication addressed to the Chancellor of the Exchequer by the Commons and Footpaths Preservation Society, 25 Victoria Street, Westminster, urging the need for the insertion in the Development Bill of a provision to safeguard commons and open spaces. The possible interference with such land if the Bill passes into law in its present form is viewed with much anxiety by the open space societies:—

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Development and Road Improvement Funds Bill, 1909.

Sir,—I am directed to draw your attention to the fact that the powers conferred by the above Bill as presented to Parliament may have a serious effect upon the preservation of commons and open spaces.

Under Clause 4 of the Bill any land (and therefore common land) can be taken compulsorily and without reference to Parliament for any of the various purposes specified in Clause 1 (1); and under Clause 9, and the Schedule to the Bill, motor roads can be made through open spaces, and building land can be acquired compulsorily by the side of these roads by means of a Treasury order, which operates without confirmation by Parliament.

During more than forty years the principle has been repeatedly affirmed and consistently upheld by Parliament that common land and open spaces shall not be appropriated for any purpose (however useful) other than that of ministering to the recreation and enjoyment of the public, except with the express sanction of Parliament in the particular case. This principle has been recently confirmed in the most explicit manner in the case of the pending Housing and Town Planning Bill, in which a clause completely satisfactory to the open space societies has been inserted on the motion of the President of the Local Government Board. I forward for your consideration an adaption of this clause to the procedure contemplated by the present Bill.

The reasons that make it desirable that no appropriation of any open space should take place without the knowledge and sanction of Parliament are, if possible, stronger in the case of the Development Bill than in that of the Housing Bill. It is unlikely that any but small portions of common land would be taken for housing purposes. But schemes of afforestation and reclamation might affect large areas of common land. It has been found in the past that, however desirable such schemes may appear on the surface, the destruction of common rights and the consequent disturbance of the rural economy of the district has resulted in the disappearance of small holdings, the crushing out of the class of small farmers and stock-keepers, and the general lowering of the status of the working agricultural population.

Afforestation or reclamation would be tantamount to inclosure, and inclosure is now universally condemned.

There may, no doubt, be exceptions to the general rule, but such exceptions should only be made with the express sanction of Parliament given after full knowledge of the particular circumstances. The decision of a question so important in its social and economic results should not be withdrawn from the elected representatives of the people.

Similarly, a motor road carried through the heart of a common, with broad building frontages on either side, would in most cases, destroy the value of the common for purposes either of recreation or of grazing, the severance being as detrimental as the actual absorption of land.

There would, indeed, be a temptation, as the Bill stands, to promoters of schemes to choose common land for their purposes, as owing to the divers interests in such land it can always, under the provisions of the Lands Clauses Acts, be acquired more cheaply than land in private ownership. For this reason railways were formerly constructed through commons wherever the opportunity occurred; and it was only owing to the intervention of the House of Commons at the instance of the Commons Preservation Society that this serious injury to the public was arrested.

If, however, a small portion of common land, or any other kind of open space, is urgently required for a scheme under the proposed Act, the clause which I enclose would enable an exchange suitable to the object in view to be arranged.

The open space societies feel sure that His Majesty's Government have no desire to confer upon the public the benefits designed by the Bill at the expense of land already dedicated to the public use, but rather to increase the interest of the State and the public in the lands of the country. They therefore express their earnest hope that you will prevent any miscarriage of the intention of the Government by inserting in the Bill some such clause as that which I forward.—I am, Sir, your obedient servant,

LAWRENCE W. CHUBB, Secretary.

THE Fareham Urban District Council have approved plans prepared by the surveyor for a new fire station and public lavatories in West Street. The estimated cost is 1,100*l*. The surveyor has been instructed to prepare the necessary detailed plans, specification and estimates for submission to the Local Government Board.

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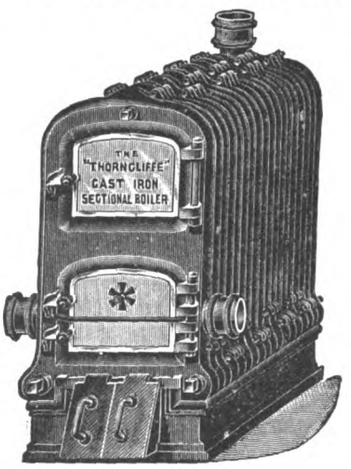
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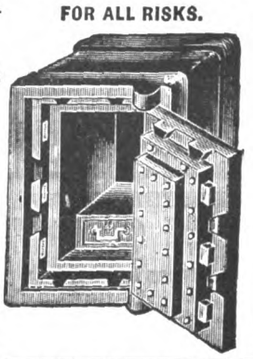
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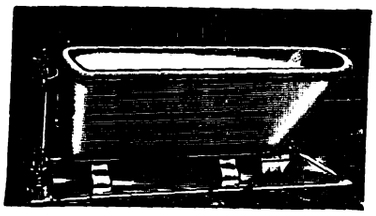
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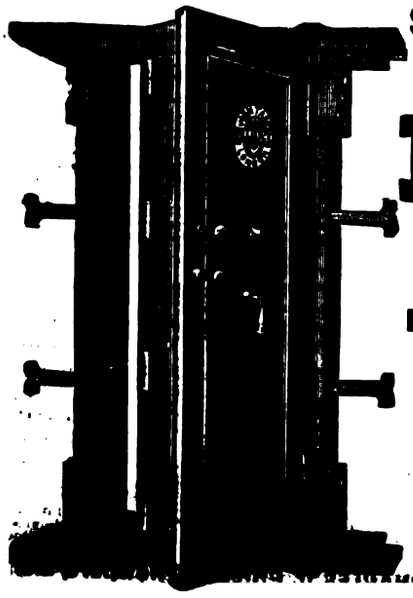
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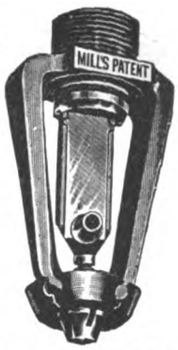
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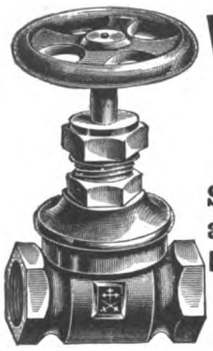
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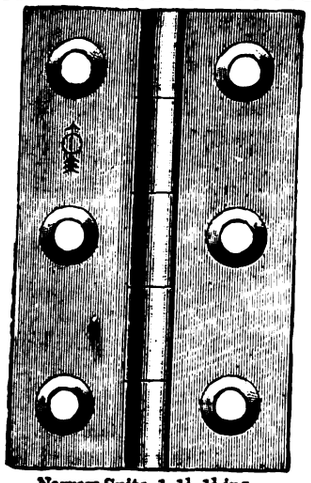
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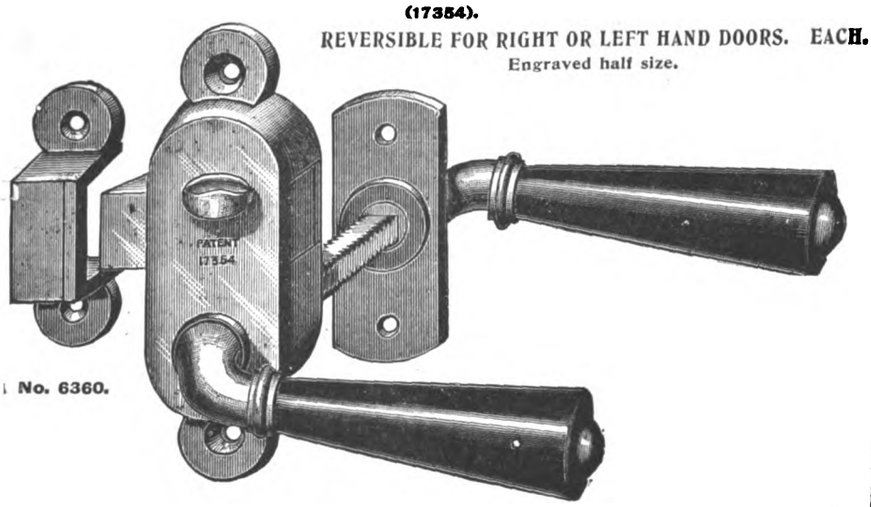
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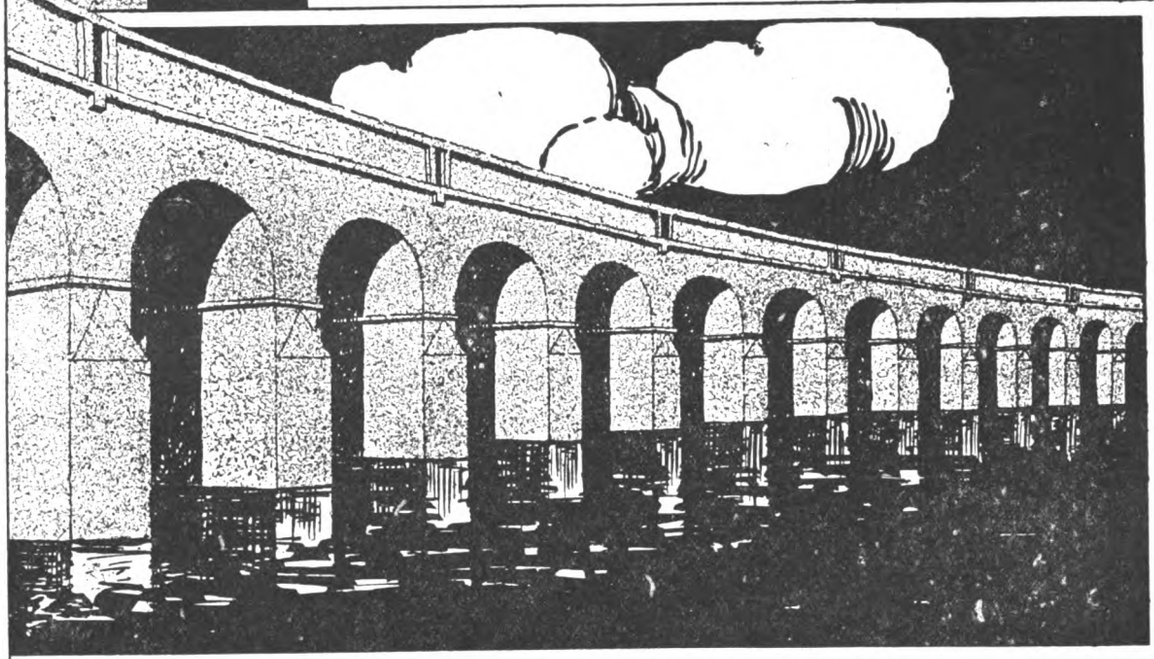
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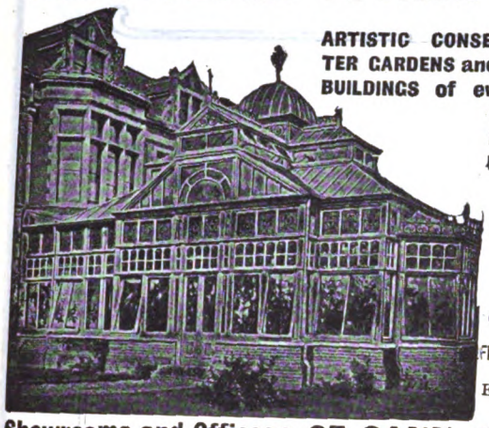
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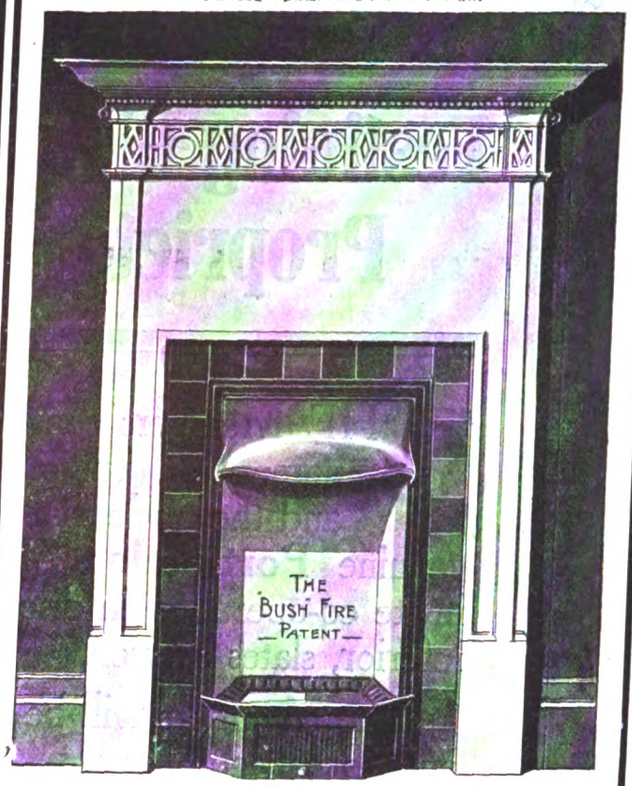
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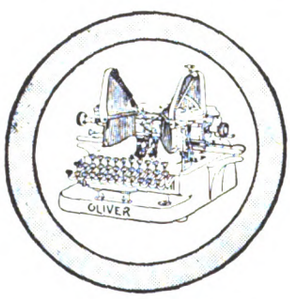
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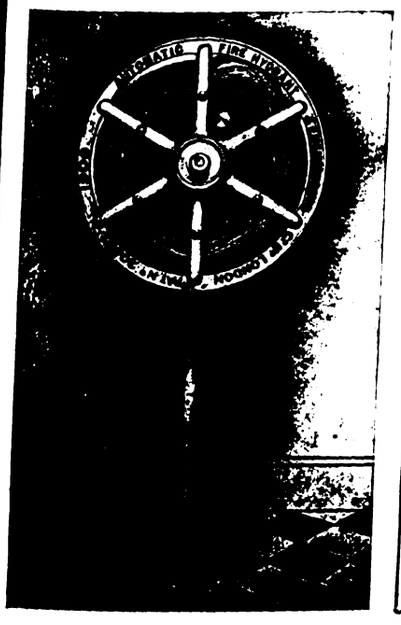
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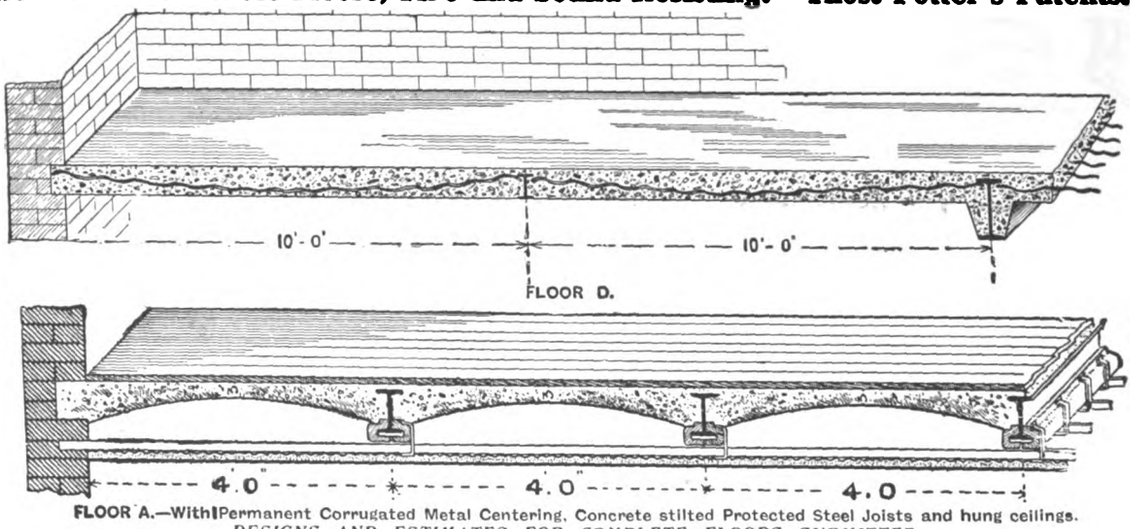
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THE

Architect and Contract Reporter.

FRIDAY, SEPT. 24, 1909.

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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

HULL.—Oct. 18.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

KENDAL.—Nov. 1.—The Corporation invite architects residing and practising in Westmorland to submit designs with description and estimate of a technical school. Premiums of 15*l.*, 10*l.*, and 5*l.* are offered.. The Borough Surveyor, Kendal.

PRESTON.—Nov. 1.—The Corporation invite designs for a boys' grammar school. Premiums of 50*l.*, 30*l.* and 20*l.* Mr. Alfred Howarth, town clerk, Town Hall, Preston.

WALES.—Oct. 1.—The Urban District Council of Aberdare invite competitive designs for a fever hospital for fifty-two patients, including administrative block, outbuildings, &c. Premiums of 100*l.*, 50*l.* and 25*l.* An assessor will be appointed on the nomination of the President of the R.I.B.A. Deposit 3*l.* 3*s.* Mr. T. Phillips, clerk, Town Hall, Aberdare.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.



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CONTRACTS OPEN.

ALDERSHOT.—Sept. 28.—For alterations and additions to the Angel Hotel and the Plough and Horses P.H., Cove. Messrs. Friend & Lloyd, architects, Aldershot.

BERKHAMSTED.—Sept. 25.—For the erection of a junior school and hall on the north side of the Grammar school quadrangle. Messrs. C. H. & N. A. Rew, architects, Berkhamsted.

BRADFORD.—Sept. 27.—For works of all trades required in the erection of infants' department, Undercliffe school. The City Architect, Whitaker Buildings, Brewery Street, Bradford.

BURY ST. EDMUND'S.—Oct. 4.—For alterations to the town hall. Deposit 2*l.* 2*s.* Mr. Sydney Naish, architect, 30 Abbeygate Street, Bury St. Edmund's.

CALSTOCK.—Sept. 29.—For the alterations and redecorating to the Wesleyan chapel and schoolroom. Deposit 1*l.* 1*s.* Mr. A. Lawry, Tharsis Villa, Calstock, Cornwall.

CAMBORNE.—Sept. 30.—For the construction of an open service reservoir, 1,000,000 gallons capacity, a water tower 20,000 gallons capacity, and sundry other works. Deposit 3*l.* 3*s.* The Camborne Water Company, Camborne.

CANTERBURY.—Sept. 30.—For enlargements and alterations at St. Augustine's Sessions House, Longport Street. Deposit 2*l.* 2*s.* The County Architect, 86 Week Street, Maidstone.

CARLISLE.—Oct. 8.—For supplying and erecting an external iron staircase at Harraby Hill House, for the Carlisle Board of Guardians; also for the breaking out of doorways, &c., in connection therewith. Mr. George Armstrong, architect, 24 Bank Street, Carlisle.

COBHAM.—Oct. 4.—For draining and laying out proposed extension to, and erection of mortuary at, Cobham cemetery. Deposit 2*l.* 2*s.* Messrs. Mills & Summerfield, surveyors, High Street, Cobham, Surrey.

CREWE.—Oct. 9.—For additions and alterations to the Bedford Street schools. Deposit 2*l.* Mr. G. Eaton-Shore, borough surveyor, Municipal Offices, Earle Street, Crewe.

CRUMPSALL.—Sept. 29.—For the erection of a branch library. Deposit 2*l.* 2*s.* The City Architect, Town Hall, Manchester.

DEVIZES.—Oct. 8.—For the erection of a house of detention at the Central Police Barracks. Deposit 1*l.* 1*s.* The County Surveyor, County Offices, Trowbridge.

DORNEY.—Oct. 2.—For the materials, labour, erection of sheds and buildings at Dorney, Slough. Deposit 1*l.* 1*s.* The Town Surveyor's Office, William Street, Slough.

EARLESTOWN.—Oct. 9.—For the erection of a technical school, for the Newton-in-Makerfield Urban District Council. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

EDINBURGH.—Sept. 27.—For the several works to be executed in the conversion of an existing building at Tynecastle Lane into a public convenience. The Burgh Engineer, City Chambers, Edinburgh.

IRELAND.—Sept. 27.—For alterations and additions to residence at Donacloney, Co. Down. Messrs. Barrett Robinson & Barcroft, architects, 1 Lombard Street, Belfast.

IRELAND.—For the erection of two semi-detached villas, Ballyholme, Bangor, Co. Down. Messrs. Moore & Flanigan, architects, 35 Royal Avenue, Belfast.

IRELAND.—Sept. 30.—For the erection and completion of a dispensary and medical officer's residence in Thomas Street, Portadown. Mr. J. W. Walby, architect, Portadown, Ireland.

KESWICK.—For the rebuilding of the Royal Oak Hotel. Mr. D. N. Pape, Royal Oak Hotel, Keswick.

KING'S NORTON.—Sept. 25.—For altering and extending the King's Heath school premises. Deposit 1*l.* 1*s.* Send names to Mr. John F. Moore, secretary to the education committee, Education Offices, King's Norton.

LEEDS.—Oct. 15.—For the construction of a small service reservoir and pump-house at Farnley, near Leeds. Deposit 1*l.* 1*s.* Mr. Chas. G. Henzell, M.I.C.E., waterworks engineer, Leeds.

LEICESTER.—Sept. 29.—For the erection of a labour exchange. Deposit 1*l.* 1*s.* Secretary, H.M. Office of Works, &c., Storey's Gate, London, S.W.

LONDON.—Sept. 28.—For plastering work in the "G and H" ward at the Sick Asylum, Devons Road, Bromley-by-Bow. The Engineer and Superintendent of Labour at the Asylum.



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LONDON.—Sept. 29.—For the erection of a public convenience in Avenue Gardens, Station Road, Wood Green, N. Deposit 1*l.* 1*s.* The Surveyor, Town Hall, Wood Green.

LONDON.—Oct. 4.—For the erection of two warrant officers' quarters, and three "A" and six "C" married soldiers' quarters (in flats), at Wellington Barracks. Deposit 10*s.* Send names by Sept. 26 to Director of Barrack Construction, 80 Pall Mall, London, S.W.

MIDDLESBROUGH.—Sept. 30.—For the erection of business premises at the corner of Grange Road and Linthorpe Road. Send names to Messrs. Moore & Archibald, architects, 27 Albert Road, Middlesbrough.

MIDDLETON.—Oct. 6.—For the erection of a secondary school in Rectory Street. Deposit 3*l.* Mr. Henry Littler, county architect, 6 Ribblesdale Place, Preston.

MILNTHORPE.—Oct. 5.—For the artificer's work in making various improvements and building new sanitary conveniences to the St. Thomas's girls' school and the national boys' school. Mr. John Stalker, M.S.A., architect and sanitary engineer, 57 Highgate, Kendal.

NEWTON HEATH.—Oct. 11.—For the erection of the Brookdale Park municipal school, Newton Heath, Manchester. Deposit 2*l.* 2*s.* The Education Offices, Deansgate, Manchester.

PLYMSTOCK.—Oct. 22.—For Council school for 260 children and a cookery and manual training centre at Plymstock, Devon. Deposit 1*l.* 1*s.* Apply by September 27, the County Architect (Education), 1 Richmond Road, Exeter.

PORTLAND.—Sept. 27.—For alterations and additions at the King's Arms Hotel, Chiswell. Mr. S. Jackson, M.S.A., architect and surveyor, Bridge Chambers, Weymouth.

PORTSMOUTH.—Sept. 28.—For the erection and maintaining for six months of a staff block at the Infectious Diseases Hospital, Milton. Deposit 2*l.* 2*s.* The Borough Engineer's Offices, Town Hall, Portsmouth.

SALFORD.—Sept. 30.—For alterations and additions to The Elms, 92 Eccles New Road. Mr. H. Lord, F.R.I.B.A., 42 Deansgate, Manchester.

SCARTHO.—Oct. 14.—For the erection of an elementary school, for the Lindsey County Council. Deposit 2*l.* 2*s.* Send names by September 30 to Messrs. Scorer & Gamble, architects, Bank Street Chambers, Lincoln.

SCOTLAND.—Sept. 28.—For mason, carpenter, slater, plumber, plasterer, painter and glazier works of house to be erected at Ianstown, Buckie. Mr. James Imlach, 9 Blantyre Terrace, Ianstown, Buckie.

SCOTLAND.—Sept. 27.—For relaying floor of Victoria Hall, Selkirk, with maple wood, suitable for purposes of roller skating. Floor measurement, 387 square yards. Mr. John Pollok, town clerk, Selkirk.

SCOTLAND.—Oct. 1.—For the reconstruction and enlargement of the lifeboat house at St. Andrews, in the county of Fife, N.B., upon a site adjoining Woodburn Street, and the rocket apparatus house thereat. Deposit 1*l.* Mr. David W. Rusack, local hon. secretary, Marine Hotel, St. Andrews, or at the office of the engineer and architect to the Royal National Lifeboat Institution, Mr. W. T. Douglass, M.I.C.E., 15 Victoria Street, Westminster, London, S.W.

SELBY.—Sept. 30.—For the following work (whole or separate tenders):—Selby secondary school, additions and alterations (builder, joiner, slater, plasterer, plumber, painter), for the West Riding education committee. Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

SOUTHMOOR.—Sept. 25.—For the erection of twenty-three houses. Mr. J. Wm. Rounthwaite, A.R.I.B.A., 13 Mosley Street, Newcastle-on-Tyne.

STROUD.—Oct. 6.—For additions to casual wards. Mr. G. P. Milnes, architect, 6 Rowcroft, Stroud.

SPRINGFIELD.—Oct. 6.—For erection of an engine-house and supply of an oil-engine, pump, hose, &c., at the Sewage Farm, Brookend, Springfield, near Chelmsford, for the Chelmsford Urban and Rural District Councils. Borough Surveyor, 16 London Road, Chelmsford.

ST. BREWARD.—Sept. 25.—For the erection of a china clay kiln, shed, tanks, &c., also for excavating for sidings at Penpont, St. Breward, Cornwall. Mr. T. H. Andrew, engineer, Market Hill, St. Austell.

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USHAW MOOR.—Oct. 6.—For erection of twenty cottages, for the Aged Miners' Homes committee. Mr. C. Johnston, architect and surveyor, Victoria Street, Bishop Auckland.

UTTOXETER.—Sept. 25.—For the re-modelling of the Smithfield cattle market, which includes iron cattle, sheep and pig pens, paving, channelling, draining, laying of concrete, building of boundary walls and fixing of cast-iron railings and gates, laying of cast-iron water mains and fixing of hydrants, laying of tar macadam roads, concrete *in situ* and other incidental works. Deposit 2*l.* 2*s.* Send names to Mr. Wilson Marshall, surveyor to the Council, Town Hall, Uttoxeter.

WAKEFIELD.—Oct. 8.—The West Riding education committee invite whole or separate tenders for the following work, viz.:—High and Low Bishopsides, Glasshouses provided school—additions and alterations (builder, joiner, plumber, plasterer, painter). Deposit 1*l.* The West Riding architect, County Hall, Wakefield.

WALES.—Sept. 29.—For the erection of twenty or more semi-detached houses of design (*a*), and sixteen or more semi-detached houses of design (*b*), with the construction of roads, footways, and sewers, for the Court Building Club, Merthyr Tydfil. Mr. Rees Morris, architect, Idrisville, Queen's Road, Merthyr Tydfil.

WALES.—Oct. 4.—For the erection of fourteen or more cottages at Tyntyla, near Ystrad, Rhondda, for the Pantyreisteddfa Building Club. Messrs. A. O. Evans, Williams & Evans, architects, Post Office Chambers, Pontypridd.

WALES.—Oct. 4.—For extensions and alterations to the Pontypool County girls' secondary school, Monmouthshire education committee. Deposit 2*l.* 2*s.* Mr. Benjamin Lawrence, architect, Mount View, Caerau, Newport. Also for extensions and alterations to the Ebbw Vale County girls' secondary school. Deposit 2*l.* 2*s.* Mr. R. L. Roberts, architect, Abercarn.

WALES.—Sept. 30.—For rebuilding Moriah Chapel, Neath Abbey, near Neath. Messrs. Lloyd & Martin, architects, Dynevor, Skewen.

WALES.—Sept. 28.—For alterations and repairs to the Welsh Congregational Chapel, Porth. Mr. W. D. Thomas, architect, Porth.

WALES.—Oct. 1.—For extensions and alterations to the Cymmer Colliery Workmen's Library, Porth. Deposit 1*l.* 1*s.* Send names to Mr. Edwin Jones, F.I.A.S., architect and surveyor, Porth, Glam.

WALES.—Sept. 27.—For erection of two houses at Mount Pleasant, Waterloo Road, Abersychan. Messrs. Pitten & Wilton, architects, &c., Club Chambers, Pontypool.

WALES.—Sept. 28.—For erecting vicarage at Moylgrove, Pembrokeshire. The Rev. E. P. Jones, B.A., Trefigin, Cardigan.

WALES.—Oct. 1.—For the carrying out of the following works:—(1) Erection of new school at Porth, to be known as "Islwyn school," with accommodation for 400 mixed and 400 infant scholars; (2) erection of two new departments at Penyrenglyn school, Treherbert, to accommodate 400 girls and 400 infants, for the Rhondda Urban District Council. Deposit 2*l.* 2*s.* in each case. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

WOMBWELL.—Oct. 1.—For enlarging the premises of the Wombwell Working Men's Club and Institute by the erection of a billiard room, &c. Mr. Jno. Robinson, architect and surveyor, Park Cottage, Wombwell.

THE tunnel constructed for the purpose of conveying water from the Derwent Valley into the Rivelin for the improved corporation supply to Sheffield has been pierced. The work was commenced in July, 1904. It was decided to drive the tunnel from each end, to meet in the middle, without shafts. It is 6 feet by 6 feet 6 inches in diameter, and the total length, when it is completed, will be 7,623 yards, or 4½ miles. It is the longest tunnel of its kind in the United Kingdom, and the cost up to date is put at 136,000*l.* An extra expenditure of about 14,000*l.* will be necessary before the work is complete.

THE Southwark Borough Council have instructed their engineer to proceed with the necessary preliminary works for the construction of subways at the Elephant and Castle, for which powers had been obtained in the London County Council (General Powers) Act, 1909. The estimated cost of the subways is 15,000*l.*

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TENDERS.

BIRMINGHAM.

For erection of a matron's house at the Workhouse infirmary. Messrs. W. H. WARD, architects, Birmingham.

Copeland	£1,087 3 7
Walton Bros.	980 0 0
Hughes	920 0 0
Sapcote & Sons	875 0 0
Harris & Son	870 0 0
Robinson	868 0 0
Elvins	865 0 0
Bates	857 10 0
Bishop	855 0 0
Barnes	830 0 0
Mobbs	827 0 0
W. J. Webb	826 0 0
Gibbs	825 0 0
Smith	820 0 0
Whittall & Sons	819 0 0
Cleaver	805 0 0
Taylor	800 0 0
J. Webb	795 0 0
Atkinson	789 0 0
Dallow & Son	788 0 0
Morris	788 0 0
Swift	787 0 0
G. Webb	755 0 0
Crowder	697 0 0

CHELMSFORD.

For additions to Thornwoods, London Road. Messrs. CHARLES & W. H. PERTWEE, architects and surveyors, Chelmsford and London.

Fincham	£150 0 0
Taylor	147 0 0
JOHNSON & HAWKES, Chelmsford (*accepted*)	144 0 0

CHELMSFORD—*continued.*

For proposed house, Springfield. Messrs CHARLES & W. H. PERTWEE, architects and surveyors, Chelmsford and London.

Fincham	£2,221 15 8
Ghoat & Son	2,150 0 0
Gowers	1,980 0 0
Johnson & Hawkes	1,977 0 0
Potter & Son	1,895 0 0
Bailey	1,872 0 0
WEIGHT, Chelmsford (*accepted*)	1,850 0 0

For alterations and additions, Cuton Hall, Springfield. Messrs. CHARLES & W. H. PERTWEE, architects and surveyors, Chelmsford and London.

Fincham	£739 0 0
Gowers	720 0 0
Weight	718 0 0
Bailey	694 17 0
BAKER & SONS, Danbury (*accepted*)	642 0 0

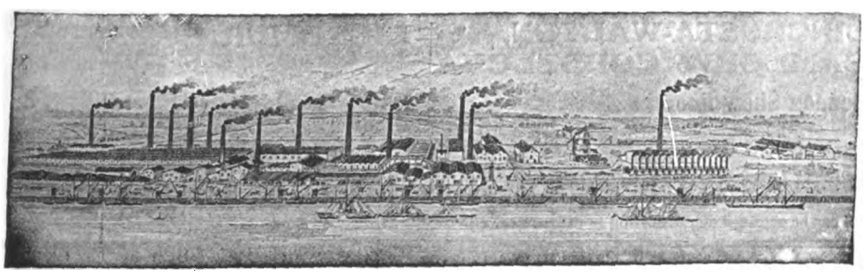
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Wilkinson & Co.	37,658 0 0
Bell & Sons	37,393 0 0
A. G. Osenton	37,163 12 8
Merritt	36,995 19 0
Pethick Bros.	36,551 0 0
Price & Co.	36,547 0 0
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CHRISTCHURCH—*continued.*

Moran & Son	35,398	5	6
Wood & Sons	35,355	19	0
Pedrette	34,813	2	10
F. Osenton	34,751	17	6
Jesty & Baker	34,731	14	0
Macdonald	34,682	0	0
Osman	34,517	10	0
Mackay	34,169	1	3
Crockerell	33,062	7	0
COOPER & Co. (*accepted*)	31,104	1	7

LONDON.

For the erection of a building upon the site of Nos. 258 to 262 Westminster Bridge Road, S.E., and site of hall at rear of No. 256. Messrs. JOSEPH & SMITHEM, architects, 83 Queen Street, Cheapside.

Simpson & Sons	£8,279	0	0
Dove Bros.	7,898	0	0
Minter	7,864	0	0
Higgs & Hill	7,864	0	0
Carmichael	7,795	0	0
Colls & Sons	7,712	0	0
Holliday & Greenwood	7,698	0	0
Holloway Bros.	7,590	0	0
Downs	7,539	0	0
Wallis & Sons	7,490	0	0
Bovis & Co.	6,941	0	0

For the making up and paving of Rectory Lane, Tooting, S.W., for the Wandsworth Borough Council.

Mowlem & Co.	£4,813	0	0
Adams	4,743	0	0
E. & E. Iles	4,630	0	0
Wood & Sons	4,600	0	0
Lane & Co.	4,590	0	0
Wall (*recommended*)	4,264	0	0

LONG EATON.

For street works for the Bonsall Street Land Society. Mr. WALTER H. WOODS, M.S.I., architect and surveyor, Long Eaton, near Nottingham.

Hutchinson & Son	£2,789	0	0
Hawley	2,446	15	6
Perks & Son	2,188	0	0
Bull	2,027	0	0
Thraves	2,022	0	0
Cox & Co.	1,949	5	8
BROWN & SON, Long Eaton (*accepted*)	1,919	10	0
Belshaw & Son	1,877	0	0

MITCHAM.

For supplying and erecting an iron building, 100 feet by 25 feet, and about 540 yards run of galvanised iron fencing at Homewood Road, for the Croydon Rural District Council. Mr. R. M. CHART, F.S.I., surveyor.

Humphries	£839	0	0
Ginger, Lee & Co.	820	0	0
Smith & Co.	724	10	0
Harbrow	690	0	0
Atkinson & Co.	684	0	0
Hill & Smith	620	0	0
Boulton & Paul	614	19	0
Baldwins	594	5	0
Cross & Co.	577	17	0
Norton Bros. & Co.	575	0	0
Priest & Son	540	0	0
Bain & Co.	540	0	0
Hayward & Sons	520	0	0
General Iron Foundry Co.	518	0	0
Palmer & Co.	498	19	6
Walker Bros., Walsall (*provisionally accepted*)	484	15	0
Surveyor's estimate	560	0	0

SHEFFIELD.

For erecting additional offices, mess-room, and retaining wall at Lumley Street destructor. Mr. CHARLES F. WIKE, C.E., city engineer, Sheffield.

Wellerman Bros., Manchester and Sheffield	£343	12	0

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SOUTH ELMSALL (YORKS).

For erecting a brick church. Mr. J. NICHOLSON JOHNSTON, architect, Yeovil, Somerset.

Hanley	£5,063 10 0
Rhodes Bros.	4,641 0 0
Bartlett	4,519 11 6
Dickinson	4,441 0 0
Kirk	3,857 13 0
Swift Bros.	3,849 5 0
GILL, Doncaster (*accepted*)	3,821 15 0
Selam & Co.	3,567 0 0

RADCLIFFE.

For erection of a United Methodist church in Ainsworth Road. Messrs. J. D. & S. J. MOULD, architects, Bury, and 52 Queen Victoria Street, London.

Blomley & Co.	£2,880 0 0
Gibson & George	2,860 0 0
Allen	2,705 0 0
R. & T. Howarth	2,625 0 0
PORTER, Bury (*accepted*)	2,527 0 0

WALES.

For extensions to the County secondary school at Pontywann, Monmouthshire. Mr. R. L. ROBERTS, architect, Abercarn.

PRITCHARD, Pontymister (*accepted*)	£1,385 0 0

For erection and completion of a Welsh Baptist chapel, Colbren, near Seven Sisters. Mr. W. BEDDOE REES, architect, Cardiff.

Samuel	£2,074 0 0
W. Williams	1,595 0 0
Turner & Sons	1,488 0 0
R. Jones, Abercrave	1,475 15 0
Thomas Bros.	1,475 0 0
J. Williams	1,464 11 8
Smith	1,412 0 0
Radford & Greaves	1,408 0 0
Maggs & Co.	1,366 11 0
R. Jones, Abertridwr	1,337 19 5
PARKINSON & HODGENS, Swansea (*accepted*)	1,284 6 8

WALES—*continued.*

For the extension of the central girls' school, Abertillery, for the Urban District Council education committee. Mr. W. H. HILEY, architect, Abertillery.

Skidmore & McWhirter	£1,441 2 4
Jones	1,221 10 0
Colborne	1,189 0 0
Tudor	1,777 0 0
MORGAN, Newport, Mon. (*accepted*)	1,100 0 0

For erecting a cottage hospital, for Abertysswg Sick Fund Society. Mr. A. F. WEBB, architect and surveyor, Blackwood and Tredegar, Mon.

W. Williams	£2,245 0 0
Lloyd	2,232 0 0
Vodden & Lee	2,165 0 0
Blundell	2,135 0 0
Davies	2,120 0 0
W. Williams	2,101 0 0
Cooper	2,100 0 0
Wilkins	2,066 0 0
MATTHEWS, Flower (*accepted*)	2,037 0 0

WINCANTON.

For erection of isolation hospital buildings and roads, drains, &c. Mr. A. J. PICTOR, A.R.I.B.A., Bruton, Somerset.

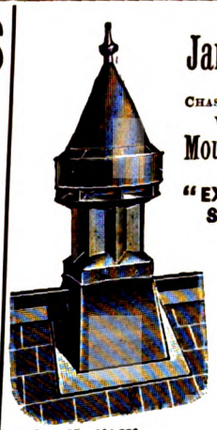
Lydford	£2,323 1 0
Spiller	2,036 0 0
Dodimead & Sons	1,958 0 0
Wills & Sons	1,940 10 0
Padfield	1,931 7 10
Wort & Way	1,879 17 7
Long & Sons	1,860 0 0
Pittard & Sons	1,852 10 0
Chancellor & Sons	1,840 0 0
Sainsbury Bros.	1,821 2 11
Stockham	1,775 10 0
Hobbs	1,764 7 2
Sweetman Bros.	1,763 3 0
Moore & Sons	1,746 0 0
Stead	1,737 0 0
BRYER, JUN., Bridgwater (*accepted*)	1,684 0 0

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WANSTEAD.

For the erection of receiving homes, Wanstead, for the West Ham Union. Messrs. J. T. NEWMAN & JACQUES, architects, 2 Fen Court, E.C. Quantities by Messrs. R. L. CURTIS & SONS.

Fitch & Cox	£28,321	0	0
Harris & Wardrop	25,693	0	0
Wall	24,959	0	0
Myall & Upson	24,483	4	6
Webster & Son	24,321	0	0
Coles	23,818	12	2
Pattinson & Sons	23,311	0	0
F. & G. Foster	23,250	0	0
Kirk & Randall	23,234	0	0
Nightingale	23,075	0	0
Gathercole Bros.	23,000	0	0
Allen & Son	22,934	0	0
Maddison	22,579	0	0
Brand, Pettit & Co.	22,400	0	0
F. & A. Willmott	22,063	0	0
Spencer, Santo & Co.	21,998	0	0
F. & H. F. Higgs	21,614	0	0
Jerram	21,349	0	0
Coxhead	21,115	0	0
Symes	20,919	0	0
Carter	20,646	0	0

WIMBLEDON.

For the erection of technical institute extension.

SPENCER, SANTO & Co., Kensington (*accepted*)	£8,310	0	0

WOLVERHAMPTON.

For minor structural alterations at the School of Art. Mr. T. H. FLEEMING, architect, Wolverhampton.

Frost	£344	14	0
Roe	334	14	0
Cave & Son	313	0	0
T. & S. Ham	313	0	0
Herbert	308	0	0
Willcock & Co.	307	10	0
Gough	302	0	0
Jones	271	0	0

YARDLEY.

For making up roads, for the Rural District Council.

Harris & Son	£3,200	0	0
Young	2,097	0	0
White	2,091	0	0
Currall, Lewis & Martin	2,063	0	0
Mason	2,061	0	0
Thorpe	2,022	0	0
COOPER, Birmingham (*accepted*)	1,869	0	0
Trentham	1,866	0	0

NEW CATALOGUE.

WE have received from the Electric and Ordnance Accessories Company, of Aston, Birmingham, their list of electric cooking and heating apparatus. Gradually electric power is coming into use for heating purposes, and in course of time there is no doubt that it will be used extensively in private houses for cooking purposes. The tables given in the catalogue will give some idea as to the probable cost.

AT Sheffield last week an important conference was held to consider the question of smoke abatement, at which were representatives of municipalities, manufacturers, and societies from various parts of the country. It was agreed first:—"That a provisional committee, with power to add to its number, be and is hereby appointed to consider the best means of promoting a strong national movement for furthering smoke abatement, and to carry on such work till a permanent organisation can be formed, and that it be the first duty of such committee to organise a deputation from the principal towns in the north, and others, to wait upon the President of the Local Government Board, and that the whole of the delegates present constitute the committee named in the resolution." At a later meeting it was agreed by twenty-three votes to three to form an association, and to leave it with the executive to report as to the most suitable name and the scope of the society's work. The minimum subscription was fixed at 2*s.* 6*d.* a year. It was further agreed to communicate with all the large provincial cities and towns and suggest the formation of local committees.

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TRADE NOTES.

THE Gilmour Door Company, Ltd., 51 Berners Street, W., supplied over 800 pine doors to the Strand Palace Hotel, London, in addition to the Samuel Elliott's patent anti-cyclone (two-way) door, to which reference was made in our description of the building which appeared last week. The Gilmour Door Co. have in the past few years booked some exceptionally large orders from all over the world, including 1,700 birch doors at the Windsor Hotel, Montreal, 984 oak doors at the Manchester Infirmary, 518 oak doors at the Imperial Hotel, Bloomsbury, and 1,197 doors at the Royal Alexandra, Winnipeg.

MESSRS. ALEXANDER RITCHIE & Co., LTD., inform us that they executed the exterior wrought-iron railings of the new Strand Palace Hotel, noticed in our last issue, and for which the architects were Mr. W. J. Ancell, of 3 Staple Inn, W.C., and Mr. H. Tanner, jun., F.R.I.B.A., 12 Regent Street, S.W., co-adjutant.

THE familiar poster of Messrs. Ripolin, Ltd., showing four house painters busily at work—the first on the house front, the second, third and fourth on the back of the man immediately in front—has been adopted by the *Sunday Chronicle* as a political cartoon. The Budget is first in the line, while Lord Rosebery, who walks behind, is painting "Revolution" across his back. Then comes Mr. Asquith, deeply engaged in painting "Futility" on the back of his lordship's coat; and last is Mr. Arthur Balfour, who, with dripping brush, stands ready to begin on Mr. Asquith.

MESSRS. PATMAN & FOTHERINGHAM, LTD., builders and contractors, 100-102 Theobald's Road, W.C., are making extensive alterations (Mr. Eustace Haynes, architect) to the premises of the General Electric Light Co., Ltd., of Queen Victoria Street, E.C. They have also just secured the contract for re-building 220-222 Great Portland Street, W., of which the architect is Mr. Claude W. Ferrier, 11 Waterloo Place, W.

THE Croydon Town Council have decided to apply to the Local Government Board for sanction to raise a loan of 10,800*l.* for additions to the borough hospital for infectious diseases.

BUILDING AND BUILDERS.

A NURSES' home is to be erected at the Epsom Workhouse and alterations carried out at the Middle House at a cost of 1,450*l.* and 150*l.* respectively. The plans have been prepared by Mr. A. C. Williams.

MR. J. T. MAY, of Eastern Esplanade, Broadstairs, builder and contractor, and proprietor of the Carlton Hotel, Broadstairs, left estate of the gross value of 32,173*l.*, of which the net personalty has been sworn at 2,838*l.*

MR. THOMAS BARNSLEY, of Augustus Road, Edgbaston, Birmingham, a past president of the Master Builders' Association, who died on June 19, aged seventy-eight, left estate valued at 79,972*l.* gross, with net personalty 37,895*l.*

MESSRS. WILLCOX & RAIKES, civil engineers, have prepared a sewerage scheme for Hanford which is estimated to cost about 5,000*l.* The Stone Rural District Council are to apply to the Local Government Board for the necessary loan.

THE Falkirk Dean of Guild Court have approved the plans submitted by Cross's Chemical Co., Ltd., Camelon, Falkirk, providing for the erection of an oilcake mill at their works in Camelon. The building will be a three-storey one, and of a specially strong nature for the heavy machinery to be installed.

HAMILTON U.F. Presbytery, N.B., have selected plans for a church at the corner of Gavin Street and Adele Street, Motherwell. The estimated cost of the building is 4,000*l.* The church is to seat 600, and a hall is to be provided giving accommodation for nearly 300, together with a session house seating 75.

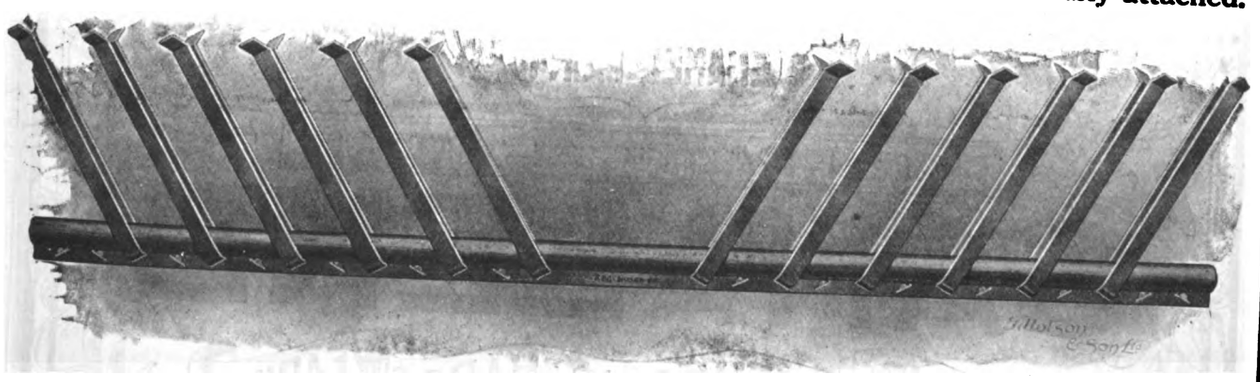
THE Local Government Board have written to the Newton Abbot Urban Council sanctioning loans for 4,600*l.*, for the provision of a cemetery in Totnes Road and the widening of the road, 24 years being the period fixed for repayment of 3,470*l.* for the cemetery buildings, whilst sixty years was allowed for the amount for the land. The Surveyor hoped to have the working plans and specifications ready for inviting tenders in about seven weeks.

AT Glasgow Dean of Guild Court on the 16th inst. a lining was granted to the Corporation to erect additional slaughter-house accommodation at Moore Street Market at an estimated cost of over 45,000*l.* Other linings granted were to the North British Locomotive Co., Ltd., Hydepark Works, to

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alter and add to premises in Ayr Street and Flemington Street, Springburn; to Elizabeth Bellord, Everton Valley, Liverpool, and others, to add to their training college in Victoria Crescent Road, Dowanhill; and to James Templeton & Co., carpet manufacturers, to alter and add to premises in West Street, Calton.

IN connection with the inclusion of common brick-clay among the minerals included in the Finance Act, some correspondence has taken place upon this subject between Messrs. Harwards & Evers, solicitors, of Stourbridge, and Mr. Cecil Harmsworth, the M.P. for Mid-Worcestershire. Messrs. Harwards & Evers have written to Mr. Harmsworth calling attention to the case of the Great Western Railway Co. and Blades, with which they were connected, which seems to deal directly with the matter under dispute. In this case it was held that common brick-clay was not a mineral within Section 77 of the Railway Clauses Consolidation Act, 1845. The solicitors continue:—"In his judgment, the learned judge found that in this district these clays are, in fact, the land itself, and 'not a thing which has a value of its own apart from the soil in which it is found, for the simple reason that it is the soil itself.' Under these circumstances we venture to think that so far as this part of the world, at any rate, is concerned, to treat this brick-clay as a mineral would inflict a great deal of hardship. Could you mention this matter to Mr. Lloyd George?" The hon. member for Mid-Worcestershire has replied as follows:—"I shall be most happy to bring the matter of the brick-clay in the Stourbridge district to the notice of Mr. Lloyd George, with a view to its being exempted from the operation of the minerals duty under the Finance Bill."

AN informal meeting connected with the building and auctioneering trades was held at the Church Institute, Tooting, on Tuesday, with the object of arranging for a future meeting at which the evil effects of the proposed Budget would be submitted to a larger audience of labouring men. The following resolution was passed:—"That this meeting of building estate developers and builders emphatically protests against, and pledges itself strenuously to oppose by all constitutional means, the land taxation proposals in the present Budget, being unanimously of opinion that such proposals have already caused an alarming increase in unemployment in the building and allied trades, and that if these proposals become law they will not only cause entire paralysis and stagnation in trade, where employment is already far below normal, but will occasion the dismissal of many old and trusted employés and workmen." The principal speaker stated that under normal circumstances eighteen firms in that district employed 5,014 men. At the present time they were employing only 2,379, a decrease of 2,635, or about 53 per cent. The builders' merchants were proportionately affected.

VARIETIES.

THE desirability of providing a pavilion at Rothesay is again under discussion, and it is expected that a scheme will materialise.

THE Bridlington Town Council have decided to purchase property at the north end of St. John Street for widening the thoroughfare and to construct lavatories and lay out a garden, at a cost of about 3,800*l*.

THE surveyor to the Atcham Rural District Council has submitted plans for the Pontesbury sewage scheme, the estimated cost of which is 2,469*l*. 6*s*. 3*d*. The scheme is under consideration.

THE Society of Engineers will hold a meeting on Monday, October 4, in Room 18, Caxton Hall, Westminster, when a paper will be read on "The Status of the Engineering Profession" by Mr. G. Allan Thomas.

THE public health committee of the Belfast Corporation have approved the plans for a new disinfecting station. Application will be made to the Local Government Board for authority to borrow the necessary money for the building.

THE Exmouth Urban District Council have decided to take the necessary steps to promote a Bill in Parliament in the ensuing session for carrying out the Dotton water scheme recommended by Messrs. Hill & Sons.

THE Higher Education Board of the eastern district of the Isle of Man have prepared a scheme for a secondary school and playing fields, to cost 20,000*l*., and for a new school for the Douglas district to accommodate 300 children at a cost of 13,000*l*. to 15,000*l*.



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ILLUSTRATIONS.

SELECTED DESIGN FOR THE EXTENSION OF TOWN HALL, GRIMSBY.

OXFORD COLLEGE SERIES, BRASENOSE.—FROM HIGH STREET—CHAPEL QUAD.

GARDEN FRONT OF HEATHCOTE, ILKLEY, FOR J. HEMINGWAY, ESQ.

THE Worcestershire County Council have adopted a recommendation that 18,500*l.* be borrowed from the Public Works Loan Board at 3½ per cent. for the erection and fitting up of the King's Norton secondary school buildings.

THE Medway Board of Guardians have approved of an estimate of 400*l.* for premises to be erected in the workhouse grounds for the purpose of corn-grinding by the casuals. It is expected that this labour will considerably diminish the number of casuals.

THE Petersfield Rural District Council have adopted a scheme of sewerage and sewage disposal for the parish of Liss, Hampshire, prepared by Mr. Harry W. Taylor, A.M.I.C.E. (Messrs. Taylor, Wallin & Taylor), of Newcastle and Birmingham, which is estimated to cost 4,000*l.*

THE Chislehurst Council last week placed the contract for the Perry Street sewer with Messrs. Muirhead & Co., of Queen Victoria Street, London, at a price of 340*l.* Sixty tenders were received from places as far away as Edinburgh, and they ranged from 200*l.* to 877*l.* 12*s.* 6*d.*, but the four lowest were incomplete.

IT is stated that the architect for Cornwall county offices has visited Truro, and so modified the plans as to enable the council chamber to be built over the first floor offices, thus doing away with expensive excavations and reducing the original estimate by a considerable amount. It is probable the building will commence before the end of the year.

AT the last meeting of the Sutton-in-Ashfield Urban Council details of erecting a new gasholder were discussed, and it was said that the Council had to choose between a holder with a capacity of 300,000 cubic feet or one with double this capacity. The estimated cost of the larger holder was 8,500*l.*, and of the smaller one 6,000*l.* It was decided to obtain tenders for the erection of holders of 400,000 and 600,000 cubic feet capacity, in order to compare the prices.

MR. F. H. TULLOCH, a Local Government Board inspector, has held an inquiry at Jarrow respecting the application of the Town Council for sanction to borrow 6,000*l.* for the provision of a swimming bath and slipper baths with offices on the site of four dwelling-houses in Walter Street. The cost of the site was 1,185*l.*, and the architects' estimate for the erection of the building 3,575*l.* The total cost would be 6,000*l.* There was no opposition.

SIR GEORGE H. CHUBB is to be presented with the freedom of the borough of Wolverhampton in recognition of his services to the State and town on October 14, when he will visit the town accompanied by the Lord Mayor of London. The world-famous firm of Messrs. Chubb was first established by Sir George's grandfather in St. James's Square, Wolverhampton, ninety years ago, and has ever since been steadily increasing the size of their factories.

MR. B. T. BATSFORD'S autumn announcements include "Windows: a Book about Stained and Painted Glass," by Lewis F. Day (third edition); "Nature and Ornament," by Lewis F. Day, Part II., dealing with Ornament, the finished product of Nature; "English Furniture and Decoration from 1680-1800," by G. M. Ellwood; "The Growth of the English House: a Short History of its Architectural Development from 1100-1800," by J. Alfred Gotch, F.S.A., F.R.I.B.A.; "English Leadwork: its Art and History," by Lawrence Weaver, F.S.A.; "Modern Cabinet Work, Furniture and Fitments," by Percy A. Wells and J. Hooper.

A SUM of 30,000*l.* has been subscribed for the erection of a new infirmary at Bradford. A site has not yet been acquired, but Sir Francis Sharp Powell, M.P., has been approached, in the hope that he will be willing to dispose of some fifteen acres of land on his estate at Horton. Sir Francis has promised to give consideration to the matter at the end of the present Parliamentary session.

AT the last meeting of the Worksop Guardians Mr. F. Hopkinson, architect, Worksop, presented an amended plan of a proposed consumptive sanatorium at Kilton Hill Infirmary, showing the back and end walls to be of brick instead of wood as at first proposed. The plan was adopted, and it was decided to apply to the Local Government Board to sanction a loan of 925*l.* for thirty years to carry out the work.

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3 Great St. Helen's, E.C. Wall-lining, Dado, &c. Messrs. Ellwood & Sledmere.
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THE Railway Passengers' Assurance Company, which was originally established in Old Broad Street in 1849, and has been housed at 64 Cornhill for the past half-century, has determined (in co-operation with the Union Bank of Scotland) to rebuild its premises, which will in future comprise 61, 62, 63 and 64 Cornhill, 124 and 126 Bishopsgate Street, and 1 White Lion Court. During the rebuilding, which will commence at once, the company's address will be 81 Cornhill, E.C.

AT Rochdale a committee has been appointed by the Town Council to consider the scarcity of working-class houses in the town, and to report as to the best means of getting dwellings built. It was stated that the number of houses built in the borough from 1890 to 1905 averaged 405, and since then it had fallen to 232, whereas to keep pace with the number falling into decay and the increase of population, at least 500 houses should be built in each year. The principal speaker laid particular stress on the poor quality of work that was put into workmen's houses.

THE Aberdeen Town Council on the 15th inst. adopted a recommendation by the water committee to the effect that the committee make application in the next session of Parliament for a Provisional Order under the Private Legislation Procedure (Scotland) Act to authorise them to take a supply of water for the city from the river Avon in accordance with the scheme outlined in the report submitted by Sir Alexander R. Binnie and Mr. G. F. Deacon, and remit to the committee to take such steps as might be requisite for the purpose. The capital cost of the scheme was estimated as follows:—First instalment of 10,000,000 gallons a day, 1,068,500*l.* (or at the rate of 106,850*l.* per million gallons per day); and for the second 10,000,000, 443,500*l.*; making a total of 1,512,000*l.*

THE Agent-General in London has just received the annual report of the Forestry Department in Queensland. The total forest area in the colony is 40,000,000 acres—the whole forest area of Australia is 97,003,000 acres. Special areas of timber amounting to close on 4,000,000 acres are reserved by the Government. The export of timber from Queensland for 1908 was 800,000 super feet; the greater part of this was undressed timber. Japan took about half of this quantity, and the United Kingdom and Germany came next as buyers. The saw-milling industry is active in Queensland; 65,000,000 feet of soft woods and 35,000,000 feet of hardwood were cut in 1908. The value at the mill per 100 super feet is:—Soft woods, 12*s.* 6*d.*; hardwood, 13*s.* 10*d.*; and cedar, 33*s.* 4*d.*

THE Sheffield Master Builders' Association have decided to give the prescribed notice for the abolition of walking-time. This will have the effect of bringing a much-debated point before a meeting of the Conciliation Board. According to the *Sheffield Daily Telegraph*, for some months now the builders and their men have been trying to readjust the question of walking-time. It is contended by the masters that outside contractors, in carrying out work outside the city, have an unfair advantage, inasmuch as they can draw on local labour without paying lodging money or transit fares, whereas these have to be paid by the Sheffield builders. The masters want the arrangement not to apply to men "started on the job," but the operatives object. Hence the deadlock. It is hoped the Conciliation Board will find a solution.

AT the last meeting of the buildings committee of the First or Upper District Committee of the County of Renfrew, it was intimated that plans had been lodged for the erecting of the following buildings:—Villa at Kirkhill, Mansewood, for Thomas Hendry, 33 Renfield Street, Glasgow; nine tenements in Yoker Road, Yoker, for William Anderson, junior, 49 Bellfield Street, Glasgow; double villa in Nevis Road, Hillpark, for John Taylor, Victoria Street, Larkhall; cottage at Old Hall, Paisley, for David Brown, junior, 15 Greenlaw Avenue, Paisley; two tenements at the corner of Garry Street and Spean Street, Cathcart, for Richard Henderson, 116 Hope Street, Glasgow; double cottage in Hillhead Road, Crookston, for John Young, Lennox Road, Crookston; double cottage in Busby Road, Clarkston, for James Lindsay, Whinfield, Brisbane Road, Largs; infant school and laundry block at Yoker Public School, for the Renfrew Landward School Board; alterations on farmhouse at Waterside Farm, Mearns, for J. C. Fergusson Pollok; double cottage in Holehouse Brae, Neilston, for Mrs. J. Quinn, Neilston; ten double cottages in Paisley Road, Barrhead, for Messrs. Young & Pollok, Main Street, Neilston. The valuation of the various proposals was estimated at 40,720*l.*, as compared with 30,510*l.* for the corresponding period of last year.

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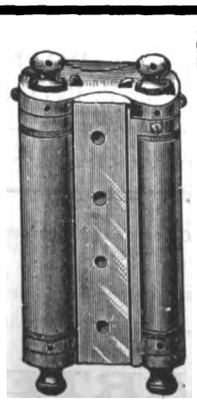
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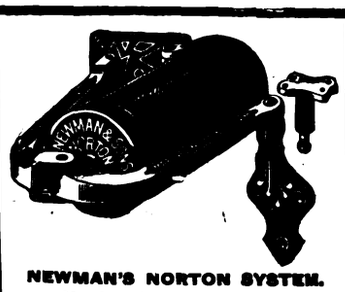
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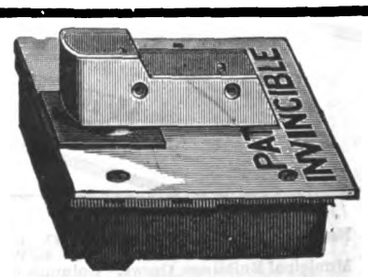
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The Best Door Spring and Check for closing doors without noise.
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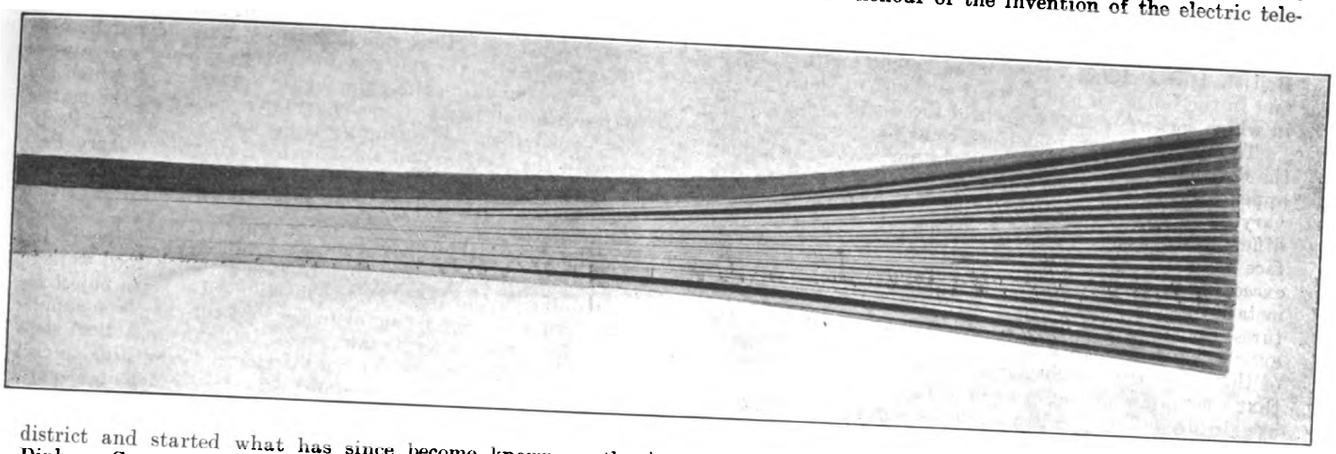
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FESTINIOG ("PORTMADOC") SLATES.

IT is now over two hundred years since slates were first known to be extracted from the outcrop of the slate veins in the mountain sides round about Festiniog. These were used on the roofs of farmhouses and buildings in the neighbourhood, which are in existence at the present day unimpaired by the ravages of time, and testify to the exceedingly durable nature of Festiniog slate as a roof covering. It is not, however, until the year 1765 that we have any record of regular quarrying operations being undertaken. In that year two quarrymen came to Festiniog from the Carnarvon

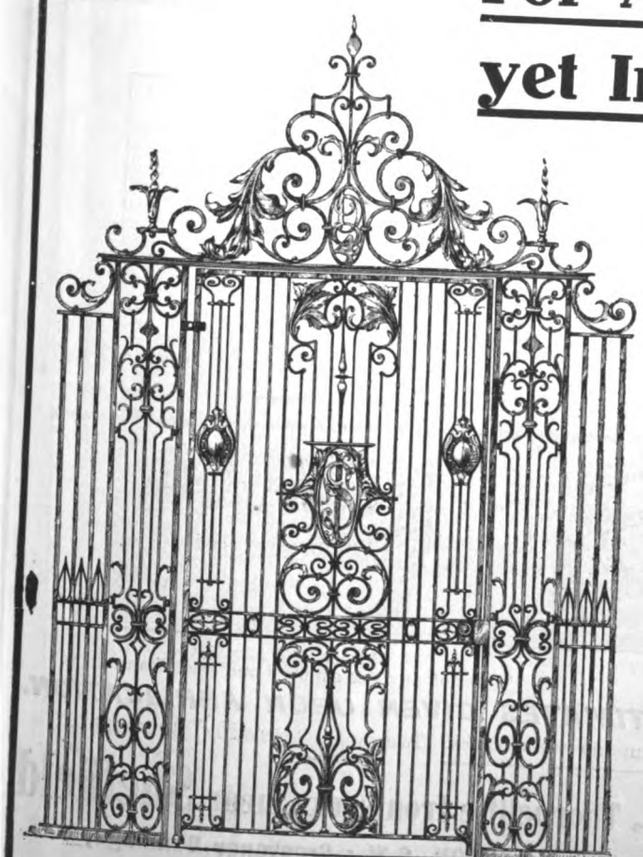


district and started what has since become known as the Diphwys Casson Quarry. This was subsequently sold in the year 1800 to two Englishmen, from one of whom, named Casson, the quarry obtained its name, and from that year on capital came to be attracted to the district. During the subsequent half-century most of the now famous quarries were opened. "In 1825," says Mr. Owen Morris in a pamphlet entitled "Portmadoc and its Resources" (1856), "there was a mania for working slate quarries in Wales. Many companies for that purpose were formed in London. One of them, styled the Welsh Slate Company, of which Lord Palmerston and Lord William Powlett are partners, purchased from Mr. Holland a portion of the ground on which were the quarries he had opened, and pursued the workings there with great vigour."

This quarry, together with that opened by Mr. Holland and a neighbouring one worked by a Mr. Matthews, now form the main portion of the workings of the Oakeley Quarries, which are the largest in the district.

Besides Lord Palmerston's, another eminent name closely associated with slate quarrying enterprise in Festiniog is that of Sir William Fothergill Cooke, who shares with Wheatstone the honour of the invention of the electric telegraph. He having come to live in the neighbourhood became much interested in the slate quarries, and was chiefly instrumental in starting the Maen Offeren Quarry, which was launched as a limited company in 1864. Another name very prominent in the development of the industry at this period is that of John W. Greaves. He gave his business, as a quarry owner, the close and constant attention of an able mind, and was responsible for much in the way of improvement, both in the method of extracting the slate and preparing it for market. Mr. Greaves exhibited slates from his quarry at the Great Exhibition of 1851 and was awarded

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a prize medal. His firm also won prize medals with their slates in London in 1862 and in Paris in 1867. At the Paris Exhibition of 1889 both the Oakeley Slate Quarries Company and the Votty and Bowydd Slate Quarries Company were awarded prize medals for their exhibits of Festiniog slates.

During the second half of the nineteenth century the Festiniog slate industry developed to large dimensions, as the superior quality of the slates there produced became known and appreciated. In 1850 the output of the quarries was 44,874 tons, and this in 1873 had grown to 144,880 tons of manufactured slates, and, with fluctuations, has remained between 100,000 and 150,000 tons since that date.

This large output finds a market not only throughout the British Isles, but also to a large extent on the Continent and in the Colonies, and is itself evidence of the high esteem in which Festiniog slates are held the world over.

Though at least five distinct veins or beds are worked in the district, the slates produced do not vary very widely in appearance or texture. They are all of a blue-gray colour, varying slightly, but to the casual observer showing but little difference between one vein and another. The cleavage surface is generally remarkably smooth and fine. They are exceedingly strong, and when rapped have an almost metallic ring. Each vein has, however, its distinctive features, and with these it is proposed to deal in a subsequent article which will go more minutely into the characteristics of the slates from each vein in turn. Suffice it to say now that the slate veins at present being worked in the district are, in descending geological order, known as "The North Vein," "The Back Vein," "The Old Vein," "The New Vein," and the "Craig Ddu" and "Wrysgan" veins. The two latter may or may not be identical.

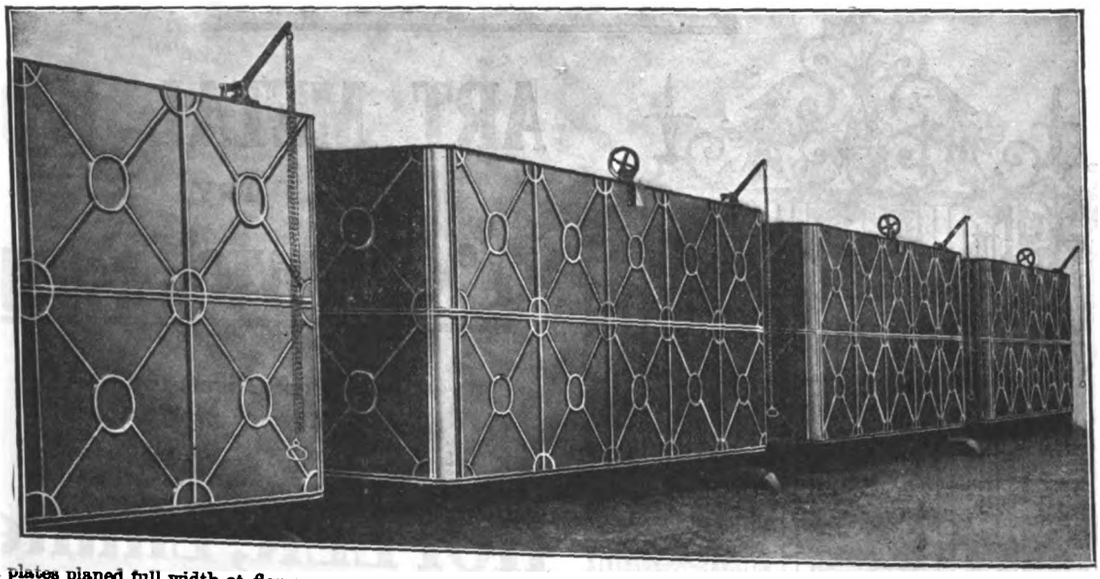
One of the most marked features of the Festiniog rock is its pliability. Long strips split thin can be bent like a well-tempered blade (*vide* illustration), and this feature has been shown in the case of actual roofing slate by the following experiment:—A 24-inch by 12-inch slate was placed on supports 22 inches apart and a weight gradually applied in the centre. Before breaking point was reached the slate showed a deflection of 0.28 inch in one case and 0.35 inch in another case. The thickness of the slate was measured as 0.19 inch in the first instance, and 0.17 inch in the second instance. This is undoubtedly a feature of value in a roofing slate, as it prevents the slate cracking under any slight movements of a roof, such as those caused by wind pressure, subsidence, or slight earthquake shocks such as are frequently experienced in this country.

Festiniog slates are very generally known in the trade as "Portmadocs," after the name of the port in Cardigan Bay at which they are put on board ship. Though the only genuine "Portmadoc" slates come from this district, the term has been known to have been given a very wide application in the hands of unscrupulous dealers, and has been used by such persons to describe not only slates of inferior quality from other districts in North Wales, but also slates of foreign origin. Architects and builders should therefore exercise every care to see that the slates they pass or purchase as "Portmadocs" are the genuine article. They can always do so by demanding the name of the quarry from which the slates originate, and if they have any doubts on the matter can dispel them by communicating with the quarry itself, or with the secretary of the Festiniog District Quarry Proprietors' Association, who is always ready to render any assistance within his power in dealin gwith matters of this nature.

The Association just mentioned came into being in the year 1894, and has since that time done much good work in consolidating the trade of the district. Its main object for some years was the fixing of prices, but this has been supplemented, particularly of late years, by many practical steps for promoting the trade of the district and obtaining specific recognition for Festiniog slates from Government Departments and public authorities.

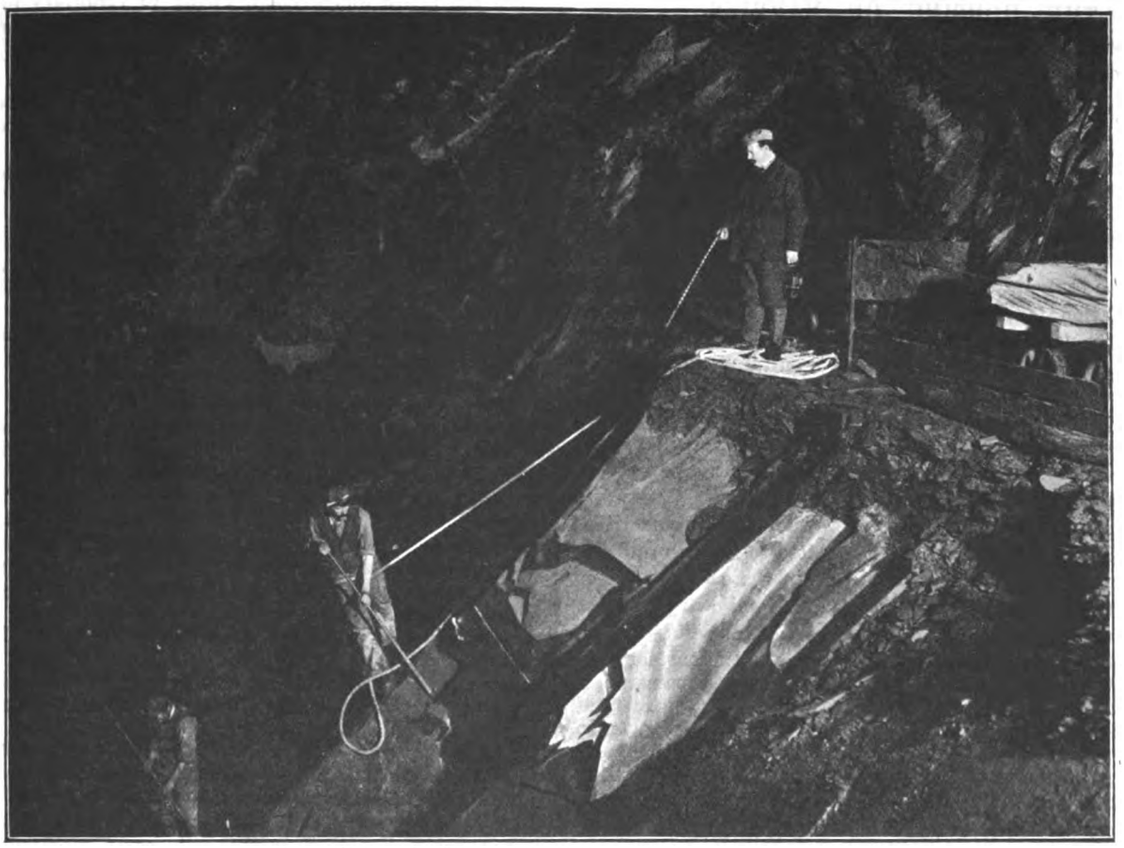
With the exception of a comparatively few quarries, those now at work in the district are members of the Association, and after what has been said it may not be out of place to give a list of them. Roughly in order of their respective outputs the quarries composing the Festiniog District Quarry Proprietors' Association are the Oakeley Slate Quarries Company, Ltd., Messrs. J. W. Greaves & Sons, Ltd., the Votty and Bowydd Slate Quarries Company, Ltd., the Maenofferen Slate Quarry Company, Ltd., the Craig Ddu Slate Quarry Company, Ltd., the Bwlch-y-Slater Slate Quarry Company, Ltd., the New Rhosydd Slate Quarry Company, Ltd., the Diphwys Casson Slate Quarries Company,

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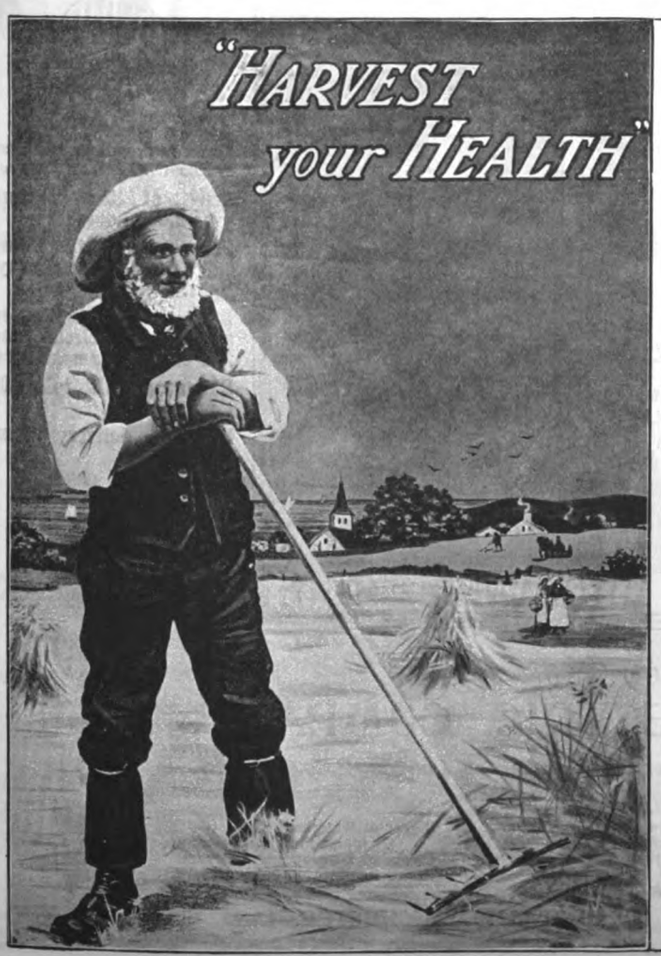
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QUARRYING SLATE ROCK, UNDERGROUND CHAMBER.

Ltd., the Park and Croesor Slate Quarries Company, Ltd., the Glanrafon Slate Quarry Company, Ltd., the Wrysgan Slate Quarry Company, Ltd.

Festiniog is unique as a slate-quarrying district in this country in that the majority of the quarries there are worked on the underground principle, and are, in fact, mines, in contrast to the open pits more usually seen elsewhere. As mines they are distinctly remarkable, the vast chambers opened in quarrying the slate constituting some of the largest to be seen underground throughout the world. Our illustration gives a view of men quarrying slate in one of these chambers some hundreds of feet from the surface.



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THE HOUSING OF NAVVIES.

THE Local Government Board have issued a highly interesting report prepared by Dr. Reginald Farrar, on the subject of "lodging workmen employed in the construction of public works." Of this we give the following abstract:—

Navvies move about from one public work to another, a distinct class or tribe, separated by habit and circumstances from the rest of the community. It is estimated that navvies and their families form a community numbering about 100,000.

In the early days of railway construction the housing accommodation for those men was very poor and scanty, or frequently none at all; many slept in sod huts, which they constructed for themselves, or in farm buildings, or wherever they could; wages, about half-a-crown a day, were paid at fortnightly, or in some cases monthly intervals, and most contractors kept provision stores and paid the men partly in food tickets, sometimes even forcing them to take a percentage of their pay in beer.

The evils that arose were so grave that a select committee of the House of Commons was appointed to inquire into the condition of the labourers employed in the construction of railways and other public works. The following extract from their report, published in 1846, is of interest:—

"As regards the class of labourers under consideration your committee cannot but conclude that the circumstances under which their labour is carried on are too generally of a deteriorating kind. They are brought hastily together in large bodies; they are therefore crowded into unwholesome dwellings, while scarcely any provision is made for their comfort or decency of living; they are released from the useful influences of domestic ties, and the habits of their former routine of life (influences and habits the more important, in proportion to their want of education); they are hard worked; they are exposed to great risk of life and limb; they are too often hardly treated; and many inducements are presented to them to be thoughtless, thriftless and improvident."

The condition of navvies has, on the whole, improved since the above was written, owing to voluntary provision made by contractors and employers. To this the improved general standard of comfort, the growth of philanthropy, the pressure of public opinion, and the special influence of such bodies as the Navvy Mission Society have contributed; but to some extent the quotation is still applicable to existing conditions.

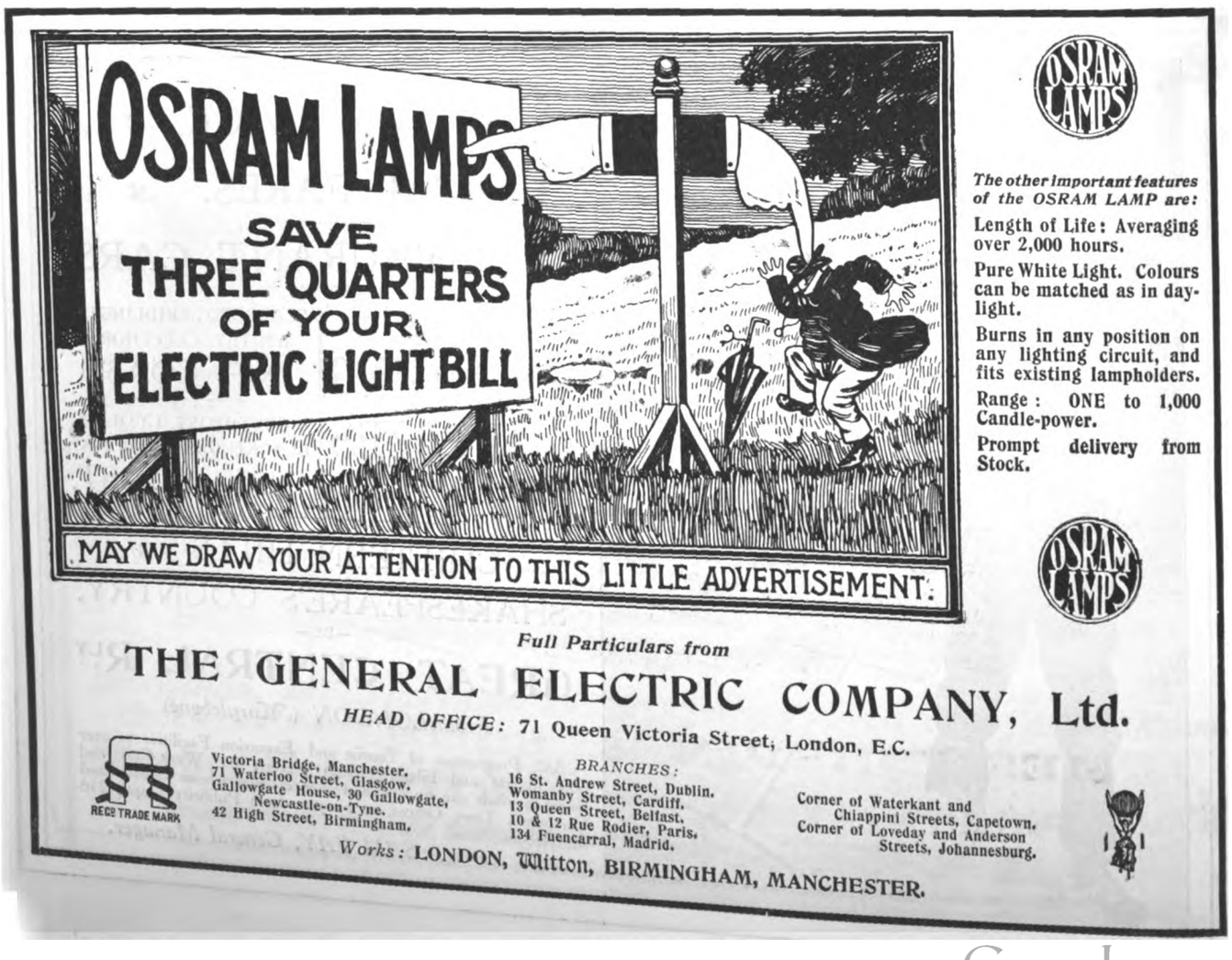
Their Report contained, among other recommendations, the following:—

"Your committee is of opinion that, previous to the collection of a body of these work-people at any spot, a sufficient lodging for them should be ascertained to exist. When the neighbourhood cannot adequately supply it, then the company should be required to provide it. Comfortable arrangements for lodging the men are directly and indirectly amply remunerative for the additional expense they may at first entail."

Except in so far as they are covered by the Truck Act and Employers' Liability Act, no legislative effect has been given to these recommendations. The Board of Trade have no jurisdiction over navvies, and no control over railways until a line is ready for inspection prior to being declared open for traffic.

Although, however, the accommodation provided has been, on the whole, improved, and although the standard of comfort among the best men is higher, the difficulty of providing adequate accommodation is serious by reason of the presence of a large number of men on public works of inferior moral and physical development, casual and irregular workers, for all of whom it is not possible to provide lodging, and who are often unwilling to avail themselves of such provision if made.

It is often stated by men of wide experience that the old navvy is tending to die out, and is being replaced by morally and physically weaker men. This is said to be due, in part, to the replacement of human labour by machinery, and particularly by the "steam-navvy," which may be roughly computed to employ 20 men while performing the work of 50. Each steam-navvy used has, therefore, displaced about 30 men, and the use of machinery in general has in a measure superseded the need for special strength and skill, which were formerly characteristic of navvies.



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Periods of trade-depression also tend to draft on to public works of construction men displaced from other employments, many of whom are social failures, having neither the will nor the physical strength requisite for continuous work.

In this connection it may be noted that a deputation from the Navvy Mission recently waited on the President of the Local Government Board to protest against the employment of local unemployed on works of construction in certain districts, to the exclusion of regular navvies. Evidence was given to the effect that pressure is being brought to bear upon contractors practically to discharge navvies and take on the local unemployed. It was claimed not only that this policy is wasteful and economically unsound, because numbers of this latter class are unfit to perform navvy labour, while others are too lazy to work, but also that it constituted a real hardship to genuine navvies, many of whom are thereby kept out of employment at a time when work is generally scarce and there is exceptional depression in respect of works of construction.

Wages.—Ordinary labourers on works of construction are generally paid 5½*d.* or 6*d.* an hour and may make on an average 3*s.* 6*d.* a day. In some cases men were only paid 4½*d.* an hour. It is generally considered by the men that the standard wage should not be less than 6*d.* an hour. The work is subject to great fluctuations on account of weather conditions. One degree of frost stops concreting, and a hard shower of rain stops puddling for the day. Specially strong or skilled men, such as those engaged in tunnelling, may make 7*s.* or 8*s.* a day.

The carrying out of public constructive works entails, as a rule, the temporary immigration into the district of a more or less numerous body of strangers, men, with some women and children. In the case of works carried out in a limited area in the immediate vicinity of a large town, the workmen may be recruited from, or may find accommodation among, the normal population.

Great numbers of navvies in large towns in or near which public works are in progress resort to common lodging houses.

In some cases, particularly if the works in progress are likely to lead to permanent increase of population and employment in the district, it may pay the contractors to build new houses or to lease existing houses for the accommodation of their workpeople. Thus, the contractors for the King's Dock, which is now being constructed for the Swansea Harbour Improvement Trust, have built fifty-one houses and rented other sixty houses for this purpose.

Even in rural districts, if there are any villages within reasonable distance of their work, a certain proportion of the workmen will find private lodgings. Decent single workmen can usually do so, but self-respecting cottagers generally refuse lodgings to men who have become degraded by "sleeping rough," such men being usually dirty, and possibly verminous. Nor can women and children, dependents of navvies, easily obtain lodgings if strangers to the district.

The letting of private lodgings to navvies often leads to overcrowding in houses.

Lines of temporary or permanent rails, necessary for the transport of material, are sometimes utilised to convey men to or from their lodgings, whether these be private lodgings or temporary huts provided by the contractors. On such works accommodation of a less substantial type than may be required for more permanent work may be sanctioned, *e.g.*, tents, or light wooden or papier maché huts.

For lack of accommodation within convenient distance, many navvies walk long distances to and from their lodgings. In several cases men have walked five or six miles each way. Those who ride bicycles can solve the problem of lodgings with greater ease.

Some works, particularly reservoirs, are situated in remote and mountainous localities. In such cases temporary accommodation in huts must be provided, or the work-people will be altogether homeless.

Many contractors erect huts, which are generally temporary buildings of corrugated iron or wood. A common type is a hut let to a foreman, who takes in lodgers. He and his family occupy, say, two rooms at one end; at the opposite end is a dormitory for lodgers, and between the two a common kitchen and living room. The average number of lodgers in these huts is from fourteen to twenty. The men pay 12*s.* to 14*s.* weekly for board and lodging.

In point of cubic air space and general accommodation, these huts appear to be usually satisfactory. They are readily erected and taken down and can be carried from one public work to another; their initial cost is not great, and

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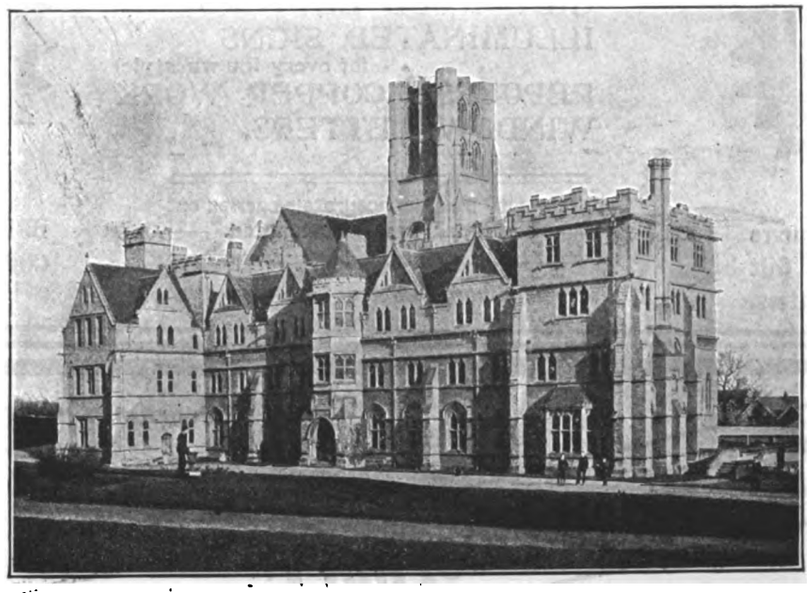
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they probably pay the contractor in the long run. This system, subject to proper inspection, may be recommended.*

Recreation Rooms.—The provision of recreation rooms serving the purpose of clubs should be regarded as a necessity of navvy life. In the absence of such provision the public house is practically the only place of resort available. In some instances they are provided by contractors; in some they are provided and managed by benevolent private persons.

Many contractors, but not all, provide mission-rooms in which religious services can be held.

Shelters for Meals.—It is desirable that on all works shelters should be erected in which meals can be taken. These shelters should contain stoves on which tins of coffee, &c., can be heated. Such shelters are also of service as affording a refuge during showers of rain.

The temperance question as affecting navvy life cannot be fully discussed in this report; neither can it be wholly ignored, for it is a matter of common experience that want of proper accommodation conduces to drunken habits among this class, and, conversely, that drunken habits, as leading to intermittent and irregular work, aggravate the difficulty of providing the necessary accommodation. Navvies who are strictly temperate seldom fail of securing regular work and good lodging.

Some managers of public works have found it useful to have the control of the liquor traffic on their works in their own hands.

In the absence of special clauses in local Acts compelling the provision of housing accommodation, it is left wholly to the discretion of individual contractors what accommodation, if any, they shall provide. In some instances no housing provision whatever is made, and the workmen are left to find lodgings as best they can; in others the arrangements are excellent; while other works of construction exemplify various degrees of difference, both as to the character and the amount of accommodation provided, between these extremes.

There are many works on which scores and even hundreds of genuine navvies are "sleeping rough" night after night. On some works they have no better provision than sod huts. Life under such conditions is conducive to physical ill-health and moral deterioration.

A contractor who provides proper and adequate lodging for his workmen is in most cases able to attract to, and retain on, his works a sufficient number of competent men. The services of strong, steady, and respectable navvies are greatly in demand: such men are usually able to choose their own job.

It is obvious that when a large proportion of the men are casual and intermittent workers, a larger number of men must be retained in the neighbourhood than are employed at any one time: to keep 500 men constantly at work a contractor often needs to have at least 750 names on his pay-sheets, and thus increases the consequent strain on the accommodation.

A contractor who carries out public works of construction and who imports into the district a large number of labourers may properly be held to be morally responsible for providing accommodation for his workpeople, and should be under obligation to do so. It is also to be desired that he should be required to provide such conditions of life as shall attract a definite number of regular workmen rather than an indefinite number of casual and intermittent workers.

There is often a marked difference between the provision made by municipal corporations or corporate bodies, such as the Derwent Valley Water Board, and that made by private contractors. In works undertaken by the former there is no question of private profit, and therefore no temptation to save money at the expense of the comfort of the labourers. On the other hand, works let out to private contractors are usually allotted to the lowest tender, and, owing to stress of competition the margin of profit is "cut" so fine that they are under a strong inducement to save money by neglecting, unless compelled to do so, to provide lodgings for their workmen.

(To be continued.)

* Private huts, *i.e.*, not provided by contractors, but erected by private persons as a business speculation, of similar construction and accommodating a like number of workpeople, are often erected in the vicinity of public works. These offer good accommodation, but are open to the objection that "shebeening" (the illicit sale of intoxicating liquor) is almost always carried on in them. "Shebeening" often goes on in the contractors' own huts, but can be to some extent controlled in them, but this is extremely difficult to do in private huts. It is to be desired that contractors should provide and retain control over all huts, but if private huts are allowed to be erected, they should be kept under close inspection.

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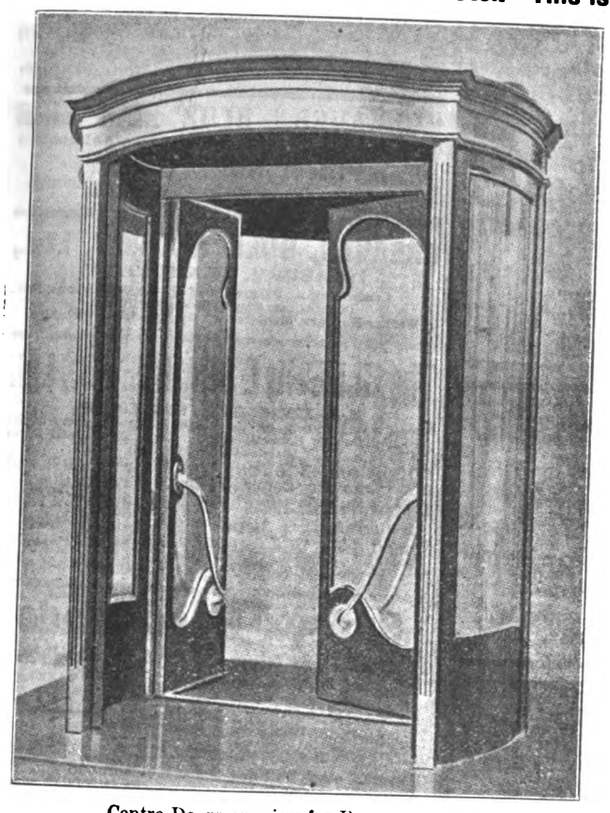
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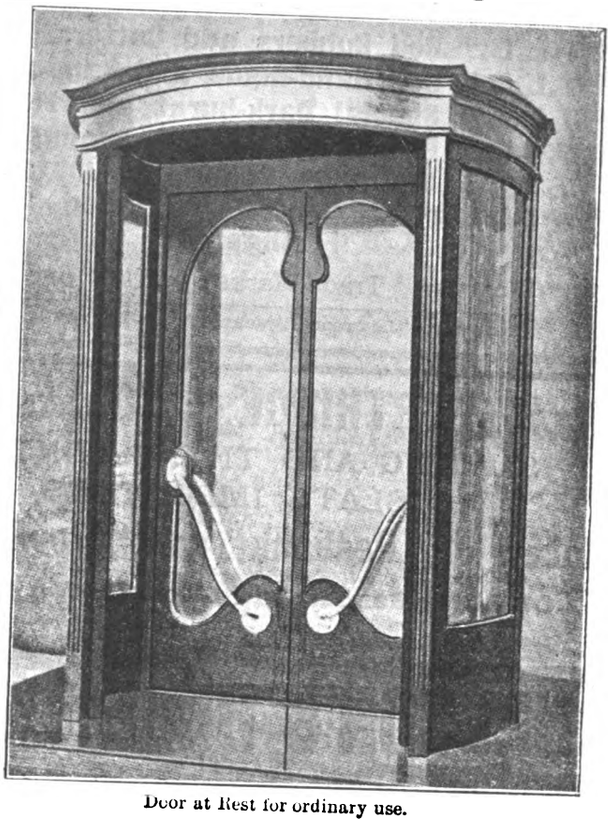
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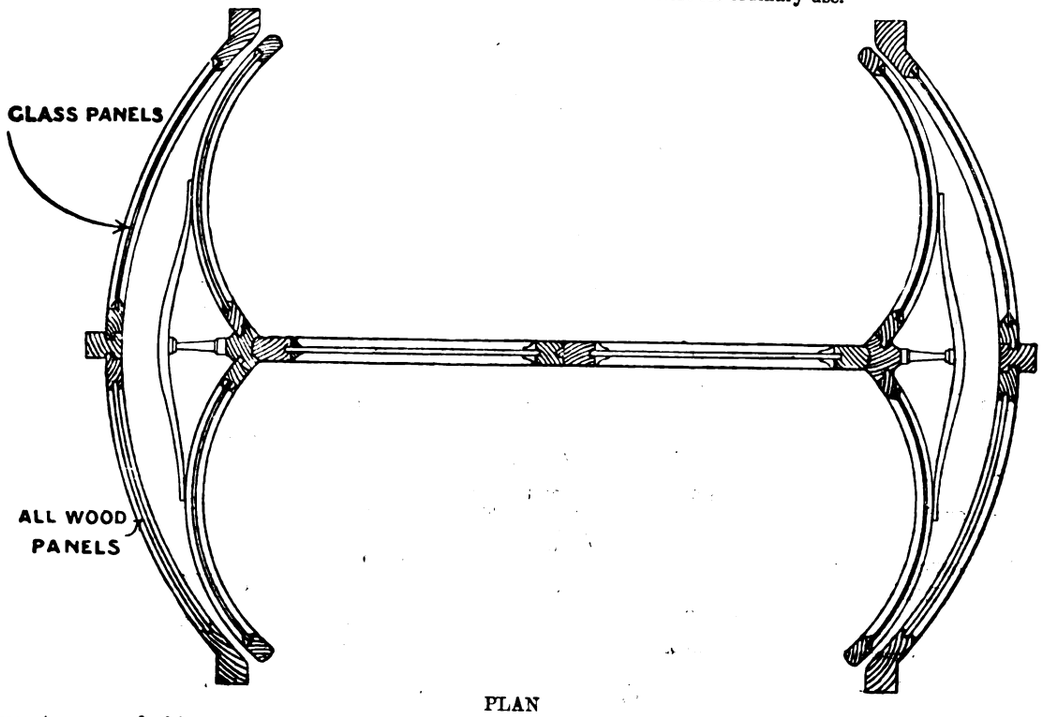
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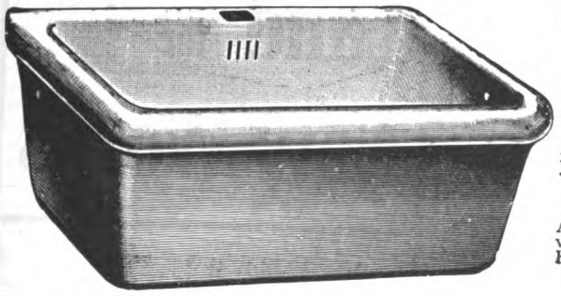
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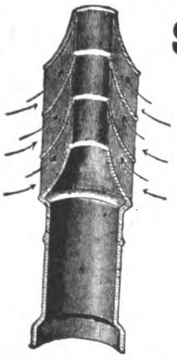


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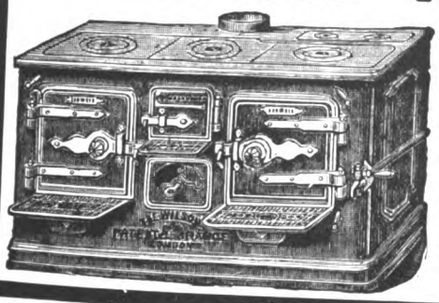
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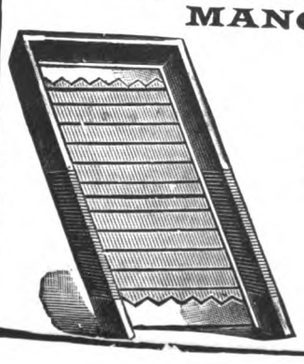
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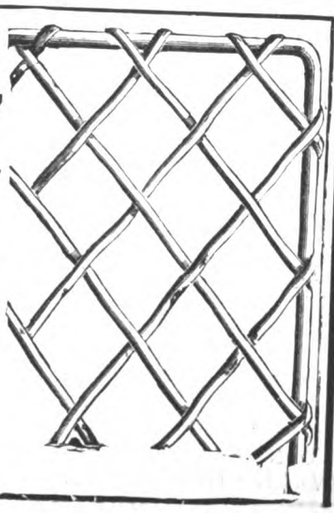


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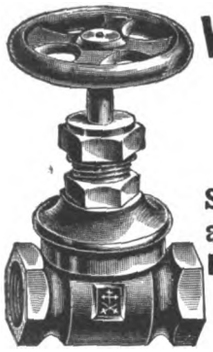
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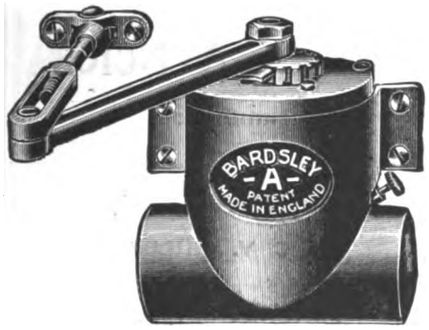
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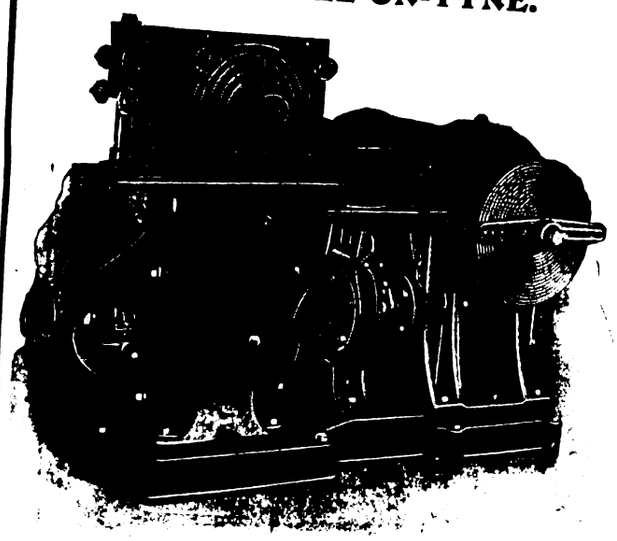
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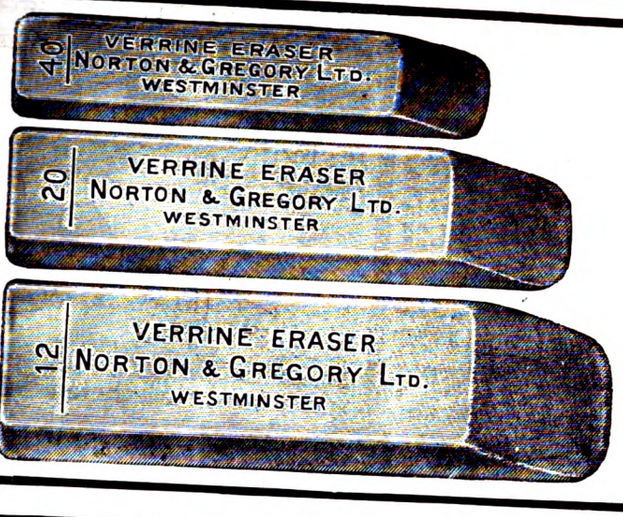
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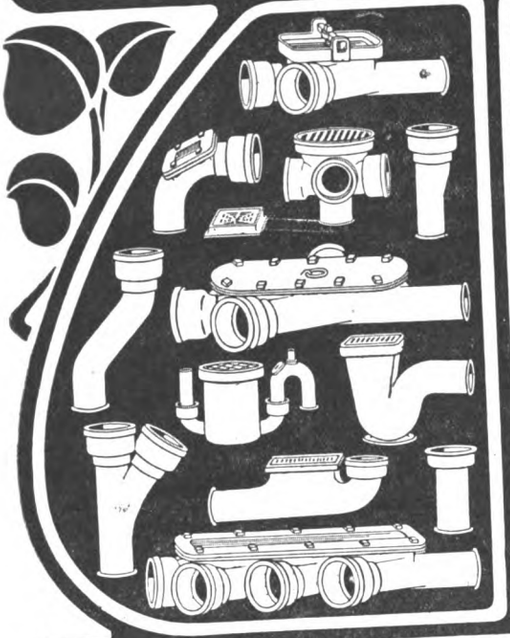
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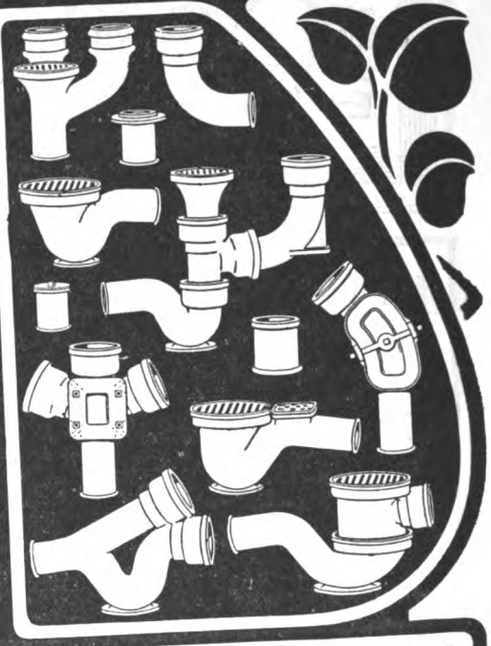
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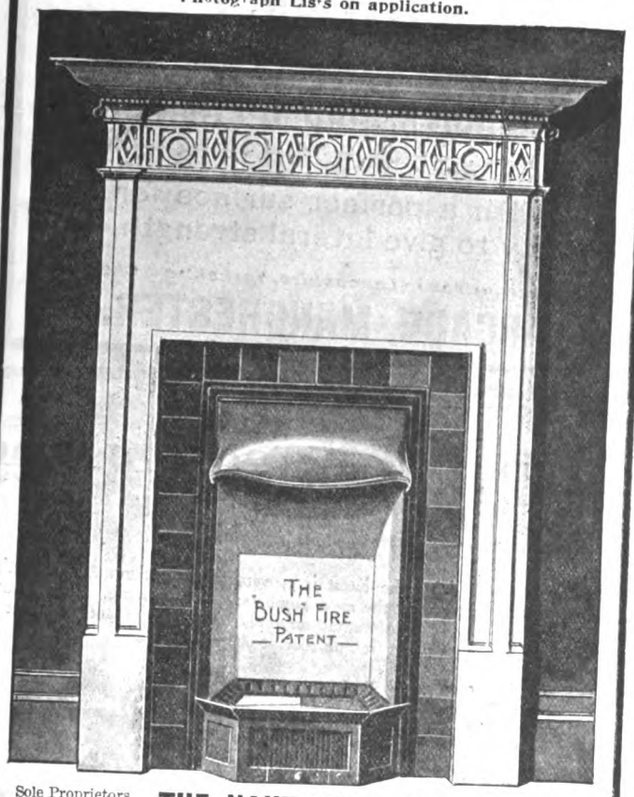
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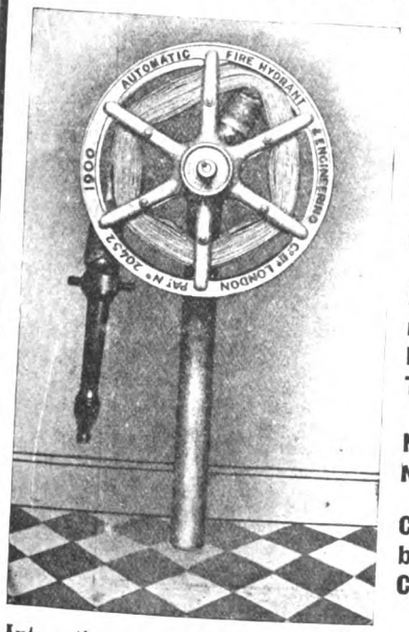
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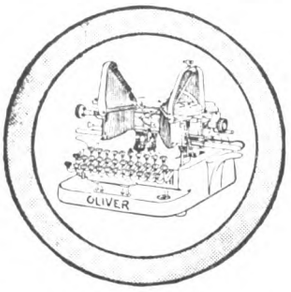
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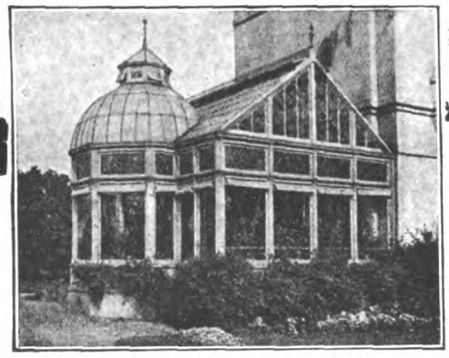
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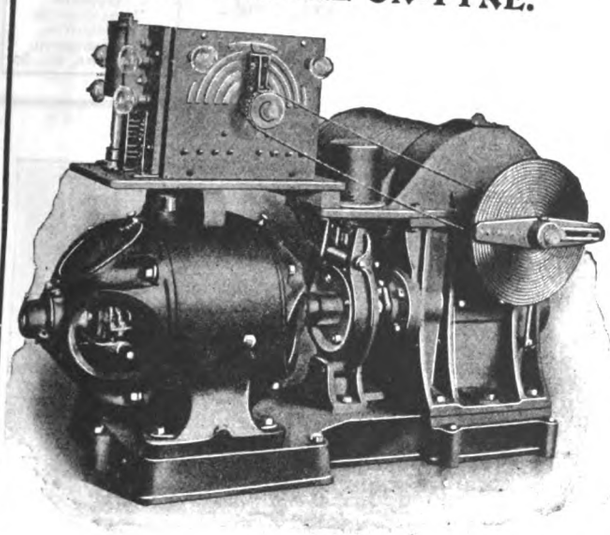


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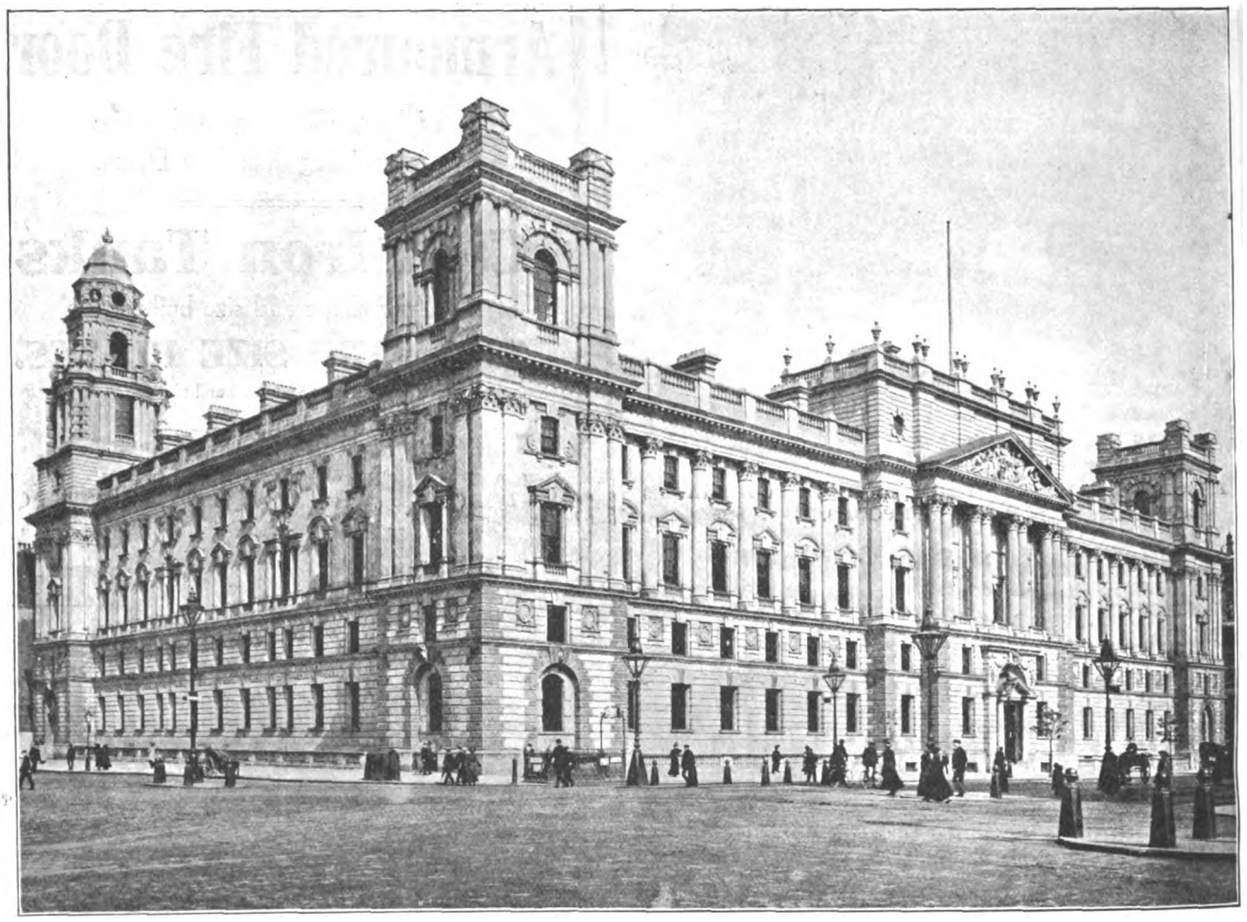
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THE

Architect and Contract Reporter.

FRIDAY, OCT. 1, 1909.

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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

HULL.—Oct. 18.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

KENDAL.—Nov. 1.—The Corporation invite architects residing and practising in Westmorland to submit designs with description and estimate of a technical school. Premiums of 15*l.*, 10*l.*, and 5*l.* are offered.. The Borough Surveyor, Kendal.

PRESTON.—Nov. 1.—The Corporation invite designs for a boys' grammar school. Premiums of 50*l.*, 30*l.* and 20*l.* Mr. Alfred Howarth, town clerk, Town Hall, Preston.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

WORKINGTON.—Oct. 30.—The Cumberland education committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the borough of Workington, Cumberland, for about 300 pupils of both sexes. Deposit 1*l.* 1*s.* Mr. C. Courtenay Hodgson, secretary, The Courts, Carlisle.

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CONTRACTS OPEN.

Annfield Plain.—Oct. 5.—For building a church for the United Methodists at Annfield Plain, Durham. Mr. Alfred T. B. Kell, architect, 61a Front Street, Chester-le-Street.

Aspatria (Cumberland).—Oct. 4.—For the various works required in erection of a shop. Messrs. W. G. Scott & Co., architects and surveyors, 2 Park Lane, Workington.

Bardsea.—Oct. 16.—For erection of a police dwelling at Bardsea, near Ulverston, Lancashire. Deposit 1*l*. Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Bath.—Oct. 26.—For erection of ten or more dwellings for persons of the labouring classes, in Middle Lane, Dolemeads. Deposit 2*l*. 2*s*. The City Surveyor's Office, Guildhall, Bath.

Birmingham.—Oct. 15.—For erection of a laundry at the workhouse, Dudley Road. Apply by October 2. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

Bradford.—Oct. 12.—For the following works, for the Guardians:—(1) Builders' work, all trades, to be let in one contract; (2) atmospheric steam heating engineer's work; (3) boilermaker's work, in connection with extension to the boiler house and the system of steam-heating at the Union workhouse, Horton Lane. Deposit 1*l*. 1*s*. The Engineer and Architect to the Board, Architect's Department, 22 Manor Row, Bradford.

Brislington.—For erection of premises in Wick Road, for the Brislington and St. Anne's Unionist Club. Apply to Mr. Harold Smith, architect, 23 Clare Street, Bristol.

Bury St. Edmund's.—Oct. 4.—For alterations to the town hall. Deposit 2*l*. 2*s*. Mr. Sydney Naish, architect, 30 Abbeygate Street, Bury St. Edmund's.

Cannock.—Oct. 7.—For erection of a small store and office at the sewage outfall works at Oxley, Staffs. Mr. Herbert M. Whitehead, engineer to the Cannock Rural District Council, Penkridge.

Carlisle.—Oct. 8.—For supplying and erecting an external iron staircase at Harraby Hill House, for the Carlisle Board of Guardians; also for the breaking out of doorways, &c., in connection therewith. Mr. George Armstrong, architect, 24 Bank Street, Carlisle.

Cobham.—Oct. 4.—For draining and laying out proposed extension to, and erection of mortuary at, Cobham cemetery. Deposit 2*l*. 2*s*. Messrs. Mills & Summerfield, surveyors, High Street, Cobham, Surrey.

Coventry.—Oct. 8.—For alterations and additions to the Stanton Club, Stoney Stanton Road. Mr. Herbert W. Chattaway, architect, Trinity Churchyard, Coventry.

Crewe.—Oct. 9.—For additions and alterations to the Bedford Street schools. Deposit 2*l*. Mr. G. Eaton-Shore, borough surveyor, Municipal Offices, Earle Street, Crewe.

Dartford.—Oct. 13.—For the conversion of Old Bank House into offices and the construction of a council chamber and incidental works. The Surveyor, Council Offices, Dartford.

Deal.—For alterations and additions to the parochial schools. Deposit 1*l*. 1*s*. Mr. C. L. Crowther, architect, Queen Street, Deal.

Devizes.—Oct. 8.—For the erection of a house of detention at the Central Police Barracks. Deposit 1*l*. 1*s*. The County Surveyor, County Offices, Trowbridge.

Earlestown.—Oct. 9.—For the erection of a technical school, for the Newton-in-Makerfield Urban District Council. Deposit 3*l*. Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Falmouth.—Oct. 12.—For erection of a detached villa on the Gyllyngdune Estate. Mr. H. E. Tresidder, P.A.S.I., A.I.S.E., architect, 23 Church Street, Falmouth.

Farnley, near Leeds.—Oct. 15.—For the construction of a small service reservoir and pump-house at Farnley, near Leeds. Deposit 1*l*. 1*s*. Mr. Chas. G. Henzell, M.I.C.E., waterworks engineer, Leeds.

Grimsby.—Oct. 20.—For erection of a Council school in Strand Street. Deposit 2*l*. 2*s*. Apply by October 14 to Mr. Herbert C. Scaping, architect, Court Chambers, Grimsby.

Handsworth.—Oct. 5.—For erecting a cart shed and raising a boundary wall at the refuse destructor works, Queen's Head Road, Handsworth. Mr. H. Richardson, A.M.I.C.E., surveyor, the Council House, Handsworth, Staffordshire.

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KNOTTINGLEY (YORKS).—Oct. 9.—For the whole or several parts, from joiners, builders, and heating engineers, in new heating chamber and apparatus, for the Ackworth (Moor Top) Provided school, near Pontefract. Mr. Charles Harris, Education Offices, Knottingley.

LEEDS.—Oct. 15.—For the construction of a small service reservoir and pump-house at Farnley, near Leeds. Deposit 1*l.* 1*s.* Mr. Chas. G. Henzell, M.I.C.E., waterworks engineer, Leeds.

LICHFIELD.—For additions and alterations to the Victoria Nursing Home. Send names to Mr. William Perry, architect, 39-41 Bore Street, Lichfield.

LONDON.—Oct. 6.—For erection of sanitary offices and redrainage of Camberwell Sorting Office. Deposit 1*l.* 1*s.* Mr. J. Wager, A.R.I.B.A., M.C.I., H.M. Office of Works, Carlisle Place, S.W.

MANCHESTER.—Oct. 4.—For the excavation, concreting and brickwork, &c., required in the foundations, &c., for retort installation at the Droylsden gas station. Mr. C. Nickson, superintendent, Gas Department, Town Hall, Manchester.

MIDDLETON.—Oct. 13.—For erection of a secondary school in Rectory Street, Middleton, Lancs. Deposit 3*l.* Mr. Henry Littler, county architect, 6 Ribblesdale Place, Preston.

MIDDLETON.—Oct. 16.—For the erection of sanitary conveniences near the Fountain. Mr. W. Welburn, borough surveyor, Town Hall, Middleton.

MILNTHORPE.—Oct. 5.—For the artificer's work in making various improvements and building new sanitary conveniences to the St. Thomas's girls' school and the national boys' school. Mr. John Stalker, M.S.A., architect and sanitary engineer, 57 Highgate, Kendal.

MORLEY.—For any part of the work required in erection of boundary walls, laying out of grounds, also sundry alterations to residence, St. Andrew's Avenue. Forward names to Mr. Josiah Auty, Union Bank Chambers, Morley.

NEWCASTLE-UPON-TYNE.—Oct. 6.—For erection of latrines at Rutherford College. Mr. A. C. Coffin, Education Offices, Northumberland Road, Newcastle-upon-Tyne.

NEWTON HEATH.—Oct. 11.—For the erection of the Brookdale Park municipal school, Newton Heath, Manchester. Deposit 2*l.* 2*s.* The Education Offices, Deansgate, Manchester.

NORTH SUNDERLAND.—Oct. 7.—For the alterations, improvements, reseating, &c., at the North Sunderland Presbyterian Church, for the Trustees. Mr. J. P. Ewing, Sea Houses, Chathill, Northumberland.

OLDHAM.—Oct. 6.—For the execution of the several trades in connection with the erection of piggeries and the necessary stores at the workhouse. Mr. C. T. Taylor, A.R.I.B.A., architect, 10 Clegg Street, Oldham.

POTTO (YORKS).—Oct. 8.—For erection of concrete abutments and wing walls, with stone pillars, for the iron bridge about to be erected over Goulton Beck, near Potto Station, for the Stokesley Rural District Council. Mr. W. H. Dixon, surveyor, Kirkby-in-Cleveland, near Stokesley.

RADCLIFFE (LANCS.).—Oct. 23.—For the construction, erection, and completion of a footbridge over the river Irwell, from Lomax Street to Cawdaw. Deposit 1*l.* 1*s.* Mr. W. L. Rothwell, engineer to the Council, Council Offices, Radcliffe.

SAFFRON WALDEN.—Oct. 16.—For erection of an additional class-room with rooms over and adjoining thereto, and for alterations to the existing buildings, at the King Edward VI. Grammar School. Mr. M. C. Robinson, architect, Wenden, Saffron Walden.

SCOTLAND.—Oct. 4.—The Dundee Town Council invite tenders for (1) Erecting extension to Caldrum Street washhouses; (2) Shelters at Eastern Necropolis; (3) Plumber work at Albert Institute. Mr. J. Thomson, city engineer, 91 Commercial Street, Dundee.

SHREWSBURY.—Oct. 4.—For building a retaining wall adjoining the river, Coton Hill Street. Deposit 1*l.* Mr. W. Chapple Eddowes, borough surveyor, The Square, Shrewsbury.

SPRINGFIELD.—Oct. 6.—For erection of an engine-house and supply of an oil-engine, pump, hose, &c., at the Sewage Farm, Brookend, Springfield, near Chelmsford, for the Chelmsford Urban and Rural District Councils. Borough Surveyor, 16 London Road, Chelmsford.

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Stafford.—For the rebuilding of the Falcon Inn, Foregate. Deposit 1*l.* 1*s.* Send names to Mr. Henry T. Sandy, architect, 22 Greengate, Stafford.

Stroud.—Oct. 6.—For additions to casual wards. Mr. G. P. Milnes, architect, 6 Rowcroft, Stroud.

Thornton.—For the various works required in extension of Thornton Grammar School, Yorks. Mr. W. Pickels, architect, Thornton.

Ushaw Moor.—Oct. 6.—For erection of twenty cottages, for the Aged Miners' Homes committee. Mr. C. Johnston, architect and surveyor, Victoria Street, Bishop Auckland.

Wakefield.—Oct. 8.—The West Riding education committee invite whole or separate tenders for the following work, viz.:—High and Low Bishopsides, Glasshouses provided school—additions and alterations (builder, joiner, plumber, plasterer, painter). Deposit 1*l.* The West Riding architect, County Hall, Wakefield.

Wales.—Oct. 2.—For erection of a bungalow at Llanrug. Mr. Ellis F. White, architect and surveyor, 17 Bridge Street, Carnarvon.

Wales.—Oct. 4.—For laying out the grounds and building boundary walls at the Llanelly Intermediate schools. Mr. J. H. Blake, clerk to the managers, 72 Stepney Street, Llanelly.

Wales.—Oct. 4.—For the erection of fourteen or more cottages at Tyntyla, near Ystrad, Rhondda, for the Pantyreisteddfa Building Club. Messrs. A. O. Evans, Williams & Evans, architects, Post Office Chambers, Pontypridd.

Wales.—Oct. 12.—For the excavation for formation of site, building of boundary retaining walls, formation and making of roads, and for the erection of ten houses at Snatchwood, Abersychan. Mr. A. Gordon Babbage, architect and surveyor, Clarence Chambers, Pontypool.

Wales.—Oct. 5.—For erection of fourteen dwelling houses at Abercanaid, for the Abercanaid Building Club. Mr. T. Edmund Rees, architect and surveyor, Merthyr Tydfil.

Wales.—Oct. 4.—For extensions and alterations to the Pontypool County girls' secondary school, Monmouthshire education committee. Deposit 2*l.* 2*s.* Mr. Benjamin Lawrence, architect, Mount View, Caerau, Newport. Also for extensions and alterations to the Ebbw Vale County girls' secondary school. Deposit 2*l.* 2*s.* Mr. R. L. Roberts, architect, Abercarn.

Wales.—Oct. 7.—For the provision of two low-pressure hot water boilers at the Free Library Buildings, Alexandra Road, Swansea. Mr. Marcus Hoskins, F.S.I., borough estate agent, Coleridge House, Swansea.

Wales.—Oct. 11.—For erection of a mixed school and altering present mixed and infant schools at Capcoch, near Aberdare. Deposit 2*l.* 2*s.* Mr. John Morris, director of education, Education Offices, Aberdare.

Wales.—Oct. 14.—For erection and completion of riding school, drill hall, and headquarters for the Glamorgan Royal Horse Artillery at Port Talbot. Deposit 1*l.* 1*s.* Mr. W. H. Dashwood Caple, F.R.I.B.A., 2 Church Street, Cardiff.

Wakefield.—Oct. 20.—The West Riding Education Committee invite whole or separate tenders for the following works, viz.:—Great Houghton, new school; Wheatley, Beckett Road provided school—enlargement (builder, joiner, plasterer, slater, plumber, painter). Deposit 1*l.* in each case. West Riding architect, County Hall, Wakefield.

Wanstead (Essex).—Oct. 15.—For erection of a one-storey school for infants on the Aldersbrook school site, Ingatestone Road. Deposit 2*l.* Mr. Chas. H. Bressey, 70 & 71 Bishopsgate Street Within, London, E.C.

Warrington.—Oct. 4.—For the adaptation of the old Post Office for Labour Exchange. H.M. Office of Works, &c., Storey's Gate, S.W.

A special meeting of the Melbourne Parish Council was held last week to consider a letter from Mr. Jardine, asking for the support of the Council for a Provisional Order for electric lighting which was proposed to be applied for. The letter further stated that it was proposed to spend on the Kendrick Mills a sum of from 7,000*l.* to 10,000*l.* in building a factory in which to introduce a new industry in Melbourne, in improving the electric light plant and mains, and in putting down storage batteries, &c. The Council decided to inquire as to the charges it was proposed to adopt under the Provisional Order before coming to a decision as to whether the order should be supported or opposed.

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TENDERS.

AYLESBURY.

For internal alterations at the Judges' Lodgings, Aylesbury, and for providing offices on the upper floor, for the Bucks County Council. Mr. R. J. Thomas, county surveyor.

Webster & Cannon	£536	0	0
Mayne & Son	525	0	0
Flint	487	0	0
Green & Co.	435	0	0
Jewell & Sons	374	10	0
Grimsdale, Aylesbury (*recommended*)	345	0	0

BREDON.

For alterations, repairs and dilapidations to the Manor House at Bredon, near Tewkesbury. Mr. C. M. C. Armstrong, architect, Warwick.

Collins & Godfrey	£582	0	0
Smith & Sons	550	0	0
Broad	508	0	0
Billings & Sons, Cheltenham (*accepted*)	506	0	0

BRIDLINGTON.

For erecting and completing two semi-detached villas on the Marine Drive, Hilderthorpe. Mr. Henry Phillips, C.E., architect and civil engineer, Hull.

Finch	£1,600	0	0
Martindale	1,540	0	0
Gant	1,487	16	0
Allison & Son	1,386	0	0
Clark	1,368	0	0
Gray, Bridlington (*accepted*)	1,280	0	0

CARLETON.

For erecting a dwelling-house on the London Road. Mr. J. Slack, architect, Carlisle.

Accepted tenders.

Ward, builder	£559	7	0
Latimer, joiner	280	0	0
Ormerod, plasterer	93	2	7
Kellett, slater	87	10	0
Graham & Crawford, plumber	82	10	0
Cameron & Keighley, painter	34	12	6

All of Carlisle.

COULSDON.

For executing private street works for Croydon Rural District Council. Mr. R. M. Chart, F.S.I., chief assistant engineer, Croydon.

Kavanagh & Co.	£3,211	0	0
Border & Co.	3,181	0	0
Quittenton	3,159	0	0
Manders	3,122	0	0
Hobman & Co.	3,040	0	0
Streeter	2,936	0	0
Adams	2,916	0	0
Yewen	2,863	0	0
Knowling & Co.	2,797	0	0
Potter & Co.	2,792	0	0
Hall	2,752	0	0
May	2,737	0	0
Wood & Sons	2,712	0	0
Free & Sons	2,552	0	0
E. & E. Iles, Wimbledon (*accepted*)	2,495	0	0
Surveyor's estimate	2,756	0	0

CROYDON.

For works to the Central Swimming Hall.

Temporary flooring.

				Alternative Tender.		
Powell & Son	£390	0	0	£360	0	0
Roberts	376	6	6	333	3	3
Complete Wood Flooring Co.	362	5	4	312	0	0
Horrocks	347	19	6	334	19	6
Bingham	331	18	7	321	18	7
Truett, Steel & Sons	314	0	0	296	10	0
Saunders	283	0	0	*268	17	6
Honour	201	10	6	177	17	6

* Accepted.

Steam heating.

Moorwood, Sons & Co.	141	0	0
Cooke	137	12	6
Nightingale & Co.	137	7	6
Wenham & Waters	112	0	0
Lohr, Clapham (*accepted*)	98	17	0

Latest Jobs in

GRANITE—Cordwainers' Hall, City. Amal. Society of Railway Servants' Offices, Euston Rd.

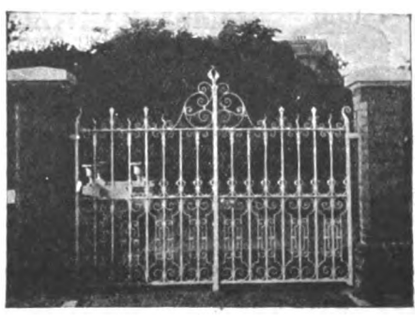
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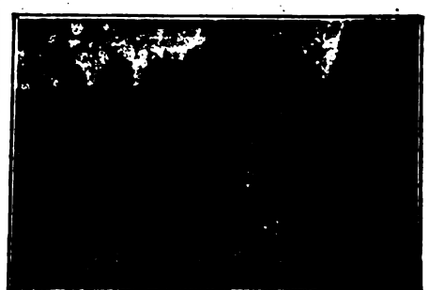
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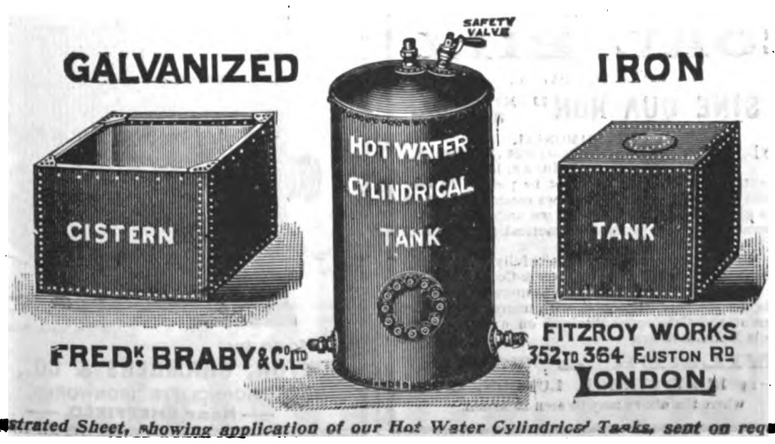
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DARTFORD.

For cleaning and painting works and repairs at Gore Farm Convalescent Fever Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, M.Inst.C.E., engineer-in-chief.

Brown & Son	£2,150 0 0
Beaven	2,131 8 9
Vigor & Co.	1,487 0 0
Kazak, Belevedere (*accepted*)	1,244 0 0

DERBY.

For painting and decorating three wards, and distempering and limewashing, for the Derby County Asylum.

Skivington & Son	£599 18 10
Norn & Healey	565 10 0
Waller	524 10 2
Skivington Bros.	452 15 5
Herny & Dodson	429 16 2
Ottewell	390 1 6
Mountford Bros., Derby (*accepted*)	355 17 9
Booth	322 3 0

ERITH.

For the erection of a porter's lodge at the Sanatorium, for the Urban District Council.

Lown & Co.	£428 18 11
Pasterfield & English	398 0 0
Shurmur & Sons	396 0 0
Jarvis & Sons	395 0 0
Jones & Andrews	375 0 0
Finnecy	370 0 0
Chandler	367 0 0
Hyde & Co.	359 0 0
Gunning & Sons	358 0 0
Pavitt & Sons	355 0 0
Friday & Ling, Erith (*accepted*)	340 0 0

ERITH—*continued*

For private street works in Lessness Park Road, Belvedere, for the Urban District Council.

Pedree	£756 9 5
W. & C. French	752 2 10
Wilson	707 9 5
A. & J. Price	700 16 8
Miskin	700 0 0
Free & Sons	686 16 4
Wheeler & Co.	683 1 9

Tenders referred to the works committee.

FAREHAM.

For alterations and additions to the town hall building.

Glover	£970 0 0
Wilcox	884 0 0
Plummer	880 0 0
Latty	857 0 0
Chance & Son, Fareham (*accepted*)	855 0 0

KIRKCALDY.

For stone wall at Kirkcaldy new harbour, for the Town Council. Mr. Jas. L. Lumsden, burgh surveyor.

Balfour Bros.	£350 0 0
Fraser	327 6 0
Kidd & Herd	300 0 0
Gray & Co.	227 1 0
Wilkie	222 16 0
Philp & Moir	222 14 4
Scott & Sons	213 15 2
Kilgour	212 3 6
Smith & Sons (*recommended*)	210 7 0
Surveyor's estimate	235 10 0

HARLINGTON.

For alterations to the Harlington Baptist church. Messrs. George Baines & Son, architects, 5 Clement's Inn, Strand., W.C.

	Estimate A.	Estimate B.	Estimate C.	Estimate D.	Estimate E.	Estimate F.	Estimate G.
Keen	£64 5 0	£65 12 6	£74 15 0	£7 1 0	£14 5 0	£14 0 0	£2 0 0
Portsmouth (approximate)	31 0 0	95 0 0	114 0 0	—	—	17 16 0	4 5 0
Winch	28 6 0	81 10 0	95 10 0	8 0 0	19 10 0	10 10 0	3 2 0
Crutchfield (*accepted*)	34 10 0	58 15 0	88 16 0	7 12 6	4 16 0	16 5 0	2 4 0



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BIRMINGHAM.
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"SINE QUA NON" KITCHEN RANGE.
RECENT TESTIMONIAL.
[Copy] 46 Newcastle St., London, E. June 8, 1909.
Gentlemen,—You will no doubt be pleased to hear that the "Sine Qua Non" Range we recently had from you is giving every satisfaction; we understand that the amount of coal consumed is practically one half of what the old range consumed.
We are, Gentlemen, yours faithfully,
(Signed for A. Eaton & Co., Ltd.,)
J. H. Stonehouse, Director.
This unsolicited testimonial, with many others, may be seen at, and Catalogues obtained on application to, the Sole Manufacturers,
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NEWTON, CHAMBERS & CO., Ltd.,
THORNCLIFFE IRONWORKS,
— Near SHEFFIELD. —

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LONDON.

For the external cleansing and painting of the municipal secondary school, for the West Ham education committee.

King & Barker (*accepted*)	£163 0 0

For the installation of electric light at the Abbey School, for the West Ham education committee.

Alliance Electrical Co.	£383 0 0
Woodward	363 2 6
Troup, Curtis & Co.	347 8 0
Larkins & Co.	336 10 0
West Ham Corporation Electric Supply	330 0 0
Whitehead Bros.	316 0 0
Pinching & Walton	311 7 0
Simmons	306 0 0
Whitehead	304 0 0
Allam & Co.	297 2 9
Vulcan Electric Co.	286 10 9
Jackson Bros.	279 0 0
Halsey	278 3 5
Weston & Sons	263 15 0
Pemberton, Arber & Carey	249 9 6
Rowland & Hulton (*accepted*)	235 16 0

For the execution of the required new street works in Leabourne Road, from the northern side of the London County Council tramway depot northward to Ravensdale Road, for the Hackney Borough Council.

Dykes	£459 15 5
Catley	457 2 9
Adams	440 2 9
Griffiths & Co.	439 16 1
Porter	435 2 11
Bloomfield	425 17 5

Cornish granite.

Catley	467 2 9
Dykes	454 15 5
Adams	444 2 9
Porter	436 16 8
Griffiths & Co.	431 16 1
Bloomfield, Tottenham (*accepted*)	419 7 5

LONDON—*continued.*

Irish granite.

Catley	507 2 9
Dykes	459 15 5
Adams	444 2 9
Porter	436 16 8

Guernsey granite.

Dykes	484 15 5
Adams	460 2 9
Bloomfield	432 7 5
Porter	431 14 11
Griffiths	430 16 3

Leicestershire granite.

Catley	472 2 9
Dykes	456 15 5
Porter	436 16 8
Bloomfield	425 17 5

For new skittle-alley and iron shelter at the Northern Convalescent Fever Hospital, Winchmore Hill, N., for the Metropolitan Asylums Board. Mr. W. T. Hatch, M.Inst.C.E., engineer-in-chief.

Hawkins & Co.	£181 0 0
Cadogan Iron Works	149 17 6
Perman & Co.	133 10 0
Gibbons Bros.	132 10 0
Hyde & Co.	131 14 0
Matthews	129 0 0
Harrison & Co.	120 0 0
General Iron Foundry Co., 43 Upper Thames Street, E.C. (*accepted*)	114 0 0

MAIDSTONE.

For the erection of an isolation hospital at Coxheath. Messrs. Ruck & Smith, architects, Maidstone.

Smith & Sons	£4,350 0 0
Edwards	4,346 0 0
F. & G. Foster	4,235 0 0
Denne & Son	4,198 0 0
Wood & Son	4,133 0 0

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MAIDSTONE—*continued.*

W. Wallis	4,112	0	0
Burrows	4,110	0	0
G. E. Wallis & Sons	4,036	0	0
Corben & Co.	3,998	0	0
Dixon	3,969	0	0
Cox Bros.	3,945	0	0
Barden & Head	3,893	0	0
Elmore & Son	3,812	0	0
Moss & Co.	3,761	0	0
Davison	3,737	0	0
Godden & Son	3,731	0	0
Skinner, Chatham (*accepted*)	3,540	0	0

ROYSTON.

For erection of a County Council school. Mr. Urban A. Smith, county surveyor, Hatfield.

Honour & Son	£6,088	5	11
Gimson & Co.	5,998	5	0
Ekins & Co.	5,979	0	0
Willmott & Son	5,966	0	0
Hinkins & Sons	5,965	0	1
Shrouder & Matthews	5,856	0	0
General Building Company	5,831	9	5
Bailey & Co.	5,782	4	0
Jaggard	5,463	16	0
Linzell	5,430	5	0
Paul	5,399	0	0
Beardsmore & West	5,395	0	0
Fryd	5,374	12	8
Bosworth & Lowe	5,357	0	0
Jacklin & Co.	5,300	0	0
Henson & Son	5,158	6	5
Hitch	5,128	0	0
Heath, March (*accepted*)	5,045	10	0
Hacksley Bros.	5,029	0	0

STANHOPE (DURHAM(.

For erection of three stone bridges on the new road from Eastgate to Rookhope, for the Weardale Rural District Council. Mr. G. W. Egglestone, highway surveyor, Stanhope,

Hyslop	£1,669	15	0
Lant	1,356	0	0
Dougill & Sons	1,237	16	3
J. Westgarth	1,163	11	8
G. Westgarth	1,148	13	6
Hopper	958	8	6
Reed	806	0	0
English, Wearhead, S.O. (*accepted*)	725	9	8

WADDON.

For erection of buildings and smiths' and ironfounders' work in connection with the Waddon waterworks, for the Croydon Town Council.

Erection of buildings, &c.

Wilkinson & Co.	£9,467	0	0
Pasterfield & English	8,449	0	0
Denne	8,345	0	0
Grace & Marsh	8,274	0	0
Hann	8,214	0	0
Everitt	8,200	0	0
Honour	8,047	10	6
Thomas & Edge	7,986	0	0
Saunders	7,980	0	0
W. Smith & Sons	7,958	0	0
Hyde & Co.	7,922	0	0
J. Smith & Sons, South Norwood (*accepted*)	7,842	0	0
Nightingale	7,780	0	0
F. & G. Foster	7,672	0	0

Smiths' and ironfounders' work.

Hyde & Co.	1,908	0	0
Howard Bros.	1,690	13	5
Brettell & Co.	1,640	0	0
Saunders	1,590	0	0
Findlay & Co.	1,577	4	0
General Iron Foundry Co.	1,568	3	0
F. & G. Foster	1,516	0	0

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WADDON—*continued.*

Abbot & Co.	1,507	7	10
Wright	1,485	11	7
Banbury	1,449	12	9
Wenham & Waters	1,446	0	0
Nightingale	1,431	0	0
Sands & Son	1,417	10	0
Peirson & Co.	1,410	11	2
Cross & Co.	1,406	5	0
Blakeley & Co.	1,361	15	0
Miller	1,334	0	0
Gibbons Bros.	1,332	17	0
E. C. & J. Keay	1,328	0	0
Clyde Structural Iron Co.	1,262	0	5
Lambourne & Co.	1,260	0	0
Goddard & Massey, Nottingham (*accepted*)	1,257	18	9

WALES.

For work at Pontllanfraith Bridge, for the Monmouthshire County Council. Mr. W. Tanner, F.S.I., county surveyor, Newport.

Findlay & Co.	£1,284	3	7
Thorne & Sons	1,255	0	0
Orr, Watt & Co.	1,198	15	6
Smith	1,183	16	6
Blundell & Bevan	1,076	15	9
Isca Foundry Co.	1,064	8	6
Motherwell Bridge Co.	1,058	0	0
Parfitt	1,049	0	0
Charles	1,035	0	0
Hunter & Co.	1,016	18	1
Brownscombe & Son	999	0	0
Barnes, Chaplin & Co.	985	15	3
Macnab	980	0	0
Finch & Co.	979	4	4
Brettell	962	7	4
Morgan & Co.	960	0	0
Cleveland Bridge Co.	958	14	11
Jordan & Son	944	0	0
Pomeroy & Co., Cardiff (*accepted*)	897	14	10

WALES—*continued.*

For work at Twyn-y-Ruthlin Pitch, for the Monmouthshire County Council. Mr. W. Tanner, F.S.I., county surveyor, Newport.

Williams	£3,497	0	0
Jones	3,055	18	8
Hunter & Co.	2,198	19	6
Newman & Smith	2,145	0	4
Macnab	1,895	0	0
Morgan & Co.	1,880	0	0
Pomeroy & Co	1,652	2	3
Osmond & Sons	1,650	12	2
Parfitt	1,644	0	0
Charles	1,626	0	0
Dix & Francis	1,620	3	2
Barnes, Chaplin & Co.	1,423	0	10
Smith, Newport (*accepted*)	1,420	0	0

For extensions to Holy Trinity Church, Llandrindod Wells. Mr. R. Wellings Thomas, F.R.I.B.A., architect, Llandrindod Wells.

Hughes & Sterling	£4,621	0	0
Lewis & Co.	4,420	0	0
Stephens, Bastow & Co.	4,258	0	0
Turford & Southward	4,061	0	0
D. & A. Merebith, Llandrindod Wells (*accepted*)	4,000	0	0

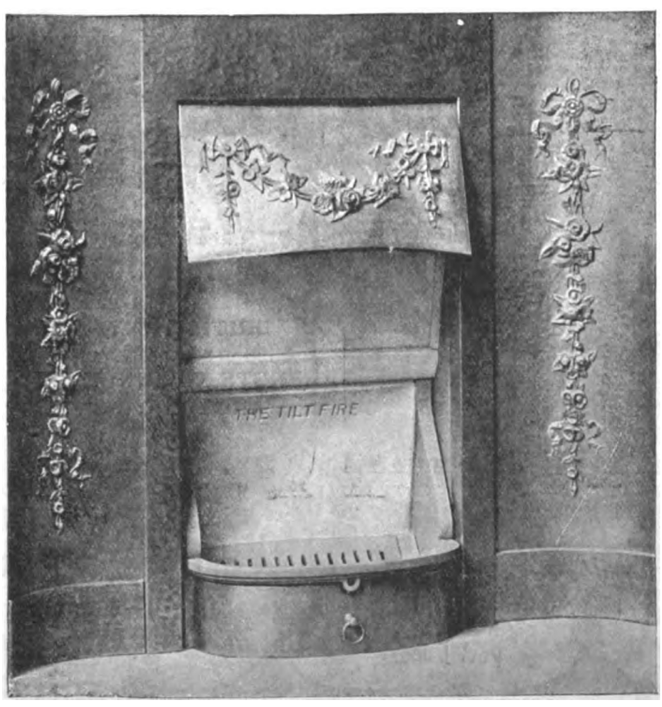
WALSALL.

For the erecting of St. Patrick's Presbytery. Mr. Henry T. Sandy, architect and surveyor, 22 Greengate, Stafford, and Birmingham.

	Alton Stone.			Guiting Stone.		
Bishop	£2,479	0	0	£2,522	0	0
Tildesley	2,475	0	0	—		
Mason	2,463	0	0	2,483	0	0
Wooton	2,435	0	0	2,460	0	0
Wistance	2,364	0	0	2,384	0	0
T. & S. Ham	2,290	0	0	2,290	0	0
Wilcock & Co.	2,289	0	0	2,319	19	0
Barnsley & Sons	2,266	0	0	—		
Kenderick & Sons (*accepted*)	2,110	0	0	2,110	0	0
Gough & Sons	2,075	0	0	2,105	0	0

THE "TILT" FIRE.

WITH THE "TILT" FIRE YOU CANNOT FAIL TO GET A BRIGHT FIRE IN A FEW MINUTES.



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WALLINGTON.

For constructing about 3,000 feet lineal of earthenware pipe sewer, with manholes, &c., for Croydon Rural District Council. Mr. J. S. Killick, A.M.Inst.C.E., Croydon.

Potter & Co., Croydon (*accepted*) . .	£680	0	0
Surveyor's estimate	695	0	0

TRADE NOTES.

We have to congratulate our contemporary the *Iron and Steel Trades' Journal*, on attaining its diamond jubilee. The number issued on Saturday last, September 25, marks the commencement of their sixty-first year.

Mackay's patent direct-acting ventilators have been supplied for the ventilation of the new schools at Blaydon-on-Tyne, erected from the plans of Mr. J. Morson, architect, Newcastle-on-Tyne.

The new clock and chimes presented to the Bardsey parish church, North Wetherby, have been set in motion. They have been made and fixed by Messrs. Wm. Potts & Sons, Ltd., clock manufacturers, Leeds and Newcastle-on-Tyne. Messrs. Potts are making new clocks for York, Bridlington, Middlesbrough, Cumberland, and other places.

The three following schools are being ventilated by means of Shorland's patent exhaust roof ventilators, supplied by Messrs. E. H. Shorland & Brother, of Manchester:—The Victoria schools, Ebbw Vale; St. John's schools, King's Lynn, and the Halton schools, near Aylesbury. Messrs. E. H. Shorland & Brother also inform us that the extensions to Napier Hospital, New Zealand, are again being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues and special inlet ventilators.

Messrs. Arthur L. Gibson & Co. announce the completion of their new Radnor Works, Strawberry Vale, Twickenham. Henceforward all orders for Kinnear patent steel rolling shutters will be filled from that address. Owing to the rapid development of their business, and for the purposes of concentration, the company have found it necessary to remove their offices and warehouses to Twickenham to which all communications must now be sent.

BUILDING AND BUILDERS.

The Staffordshire education committee have decided to ask the County Council to provide a sum of 1,050*l.* for the erection and completion of a new Council school at Hamstall Ridware.

At Ayr Dean of Guild Court last Friday plans were passed for the erection of five dwelling-houses in Monument Road, Ayr, by Messrs. J. & D. Meikle, builders, at a cost of 5,000*l.*

At Horsham last week the following plans were approved:—W. F. Pannett, four pairs of houses in Clarence Road; and H. Potter, coach-house and stables at "Eastdene," Bedford Road, for Mr. J. Burton.

The Mersey Docks and Harbour Board are considering a scheme for the erection of a destructor in Lightbody Street at a cost of 7,700*l.* It is calculated that it will mean a reduction of 1,000*l.* a year in expenses.

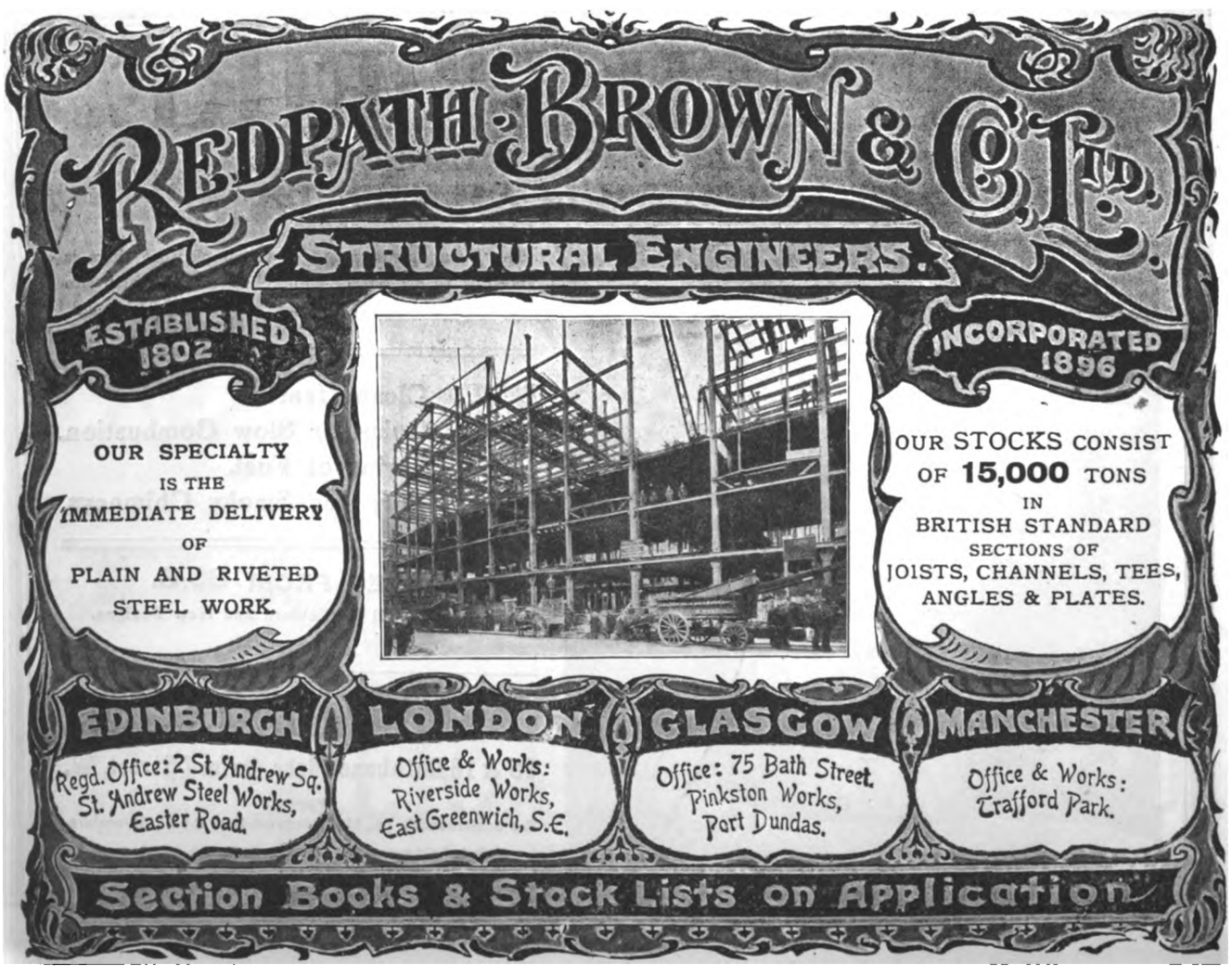
The Egham Rural District Council have approved of plans prepared by Mr. V. Gray, architect, for one section of the proposed hospital with administrative block and laundry. The outlay will be 1,800*l.*

The committee of the Dunfermline and West Fife Infectious Diseases Hospital are to consult Mr. Simpson, architect, Stirling, in regard to the proposed extension of the hospital accommodation.

The Chapel-en-le-Frith Guardians have adopted the scheme of Messrs. Moorwood, Sons & Co., of Sheffield, for alterations to the heating and cooking arrangements at the workhouse. It was decided to ask for permission to borrow 550*l.* to carry out the work.

The Southend Corporation have decided to apply to the Local Government Board for sanction to borrow 13,715*l.*, the estimated cost of erecting two electricity sub-stations for the purpose of supplying current in the eastern and western parts of the borough.

Messrs. White & Stephenson, architects, of Newcastle, have been instructed by a syndicate to prepare plans for an up-to-date skating rink and picture hall on a piece of land acquired from the Milburn estate, adjoining Hirst Schools, Ashington.



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ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 16, MR. G. H. FELLOWES PRYNNE, F.R.I.B.A.—NO. 17, MR. WILLIAM A. PITE, F.R.I.B.A.

SECOND PREMIATED DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

ST. CHAD'S CHURCH, FAR HEADINGLEY, LEEDS.—NEW CHANCEL AND VESTRIES.

PARTICK Dean of Guild Court have granted lining for the erection of a new model lodging-house on a site in North Street and Jordan Street, Whiteinch. The building, which will accommodate 364 men, will be erected at a cost of 10,000*l*. The application was made by the Jordan Street House, Partick, Ltd.

AT the meeting last week of the Edinburgh Dean of Guild Court nineteen petitions were considered, and sixteen warrants were granted, including ten remits to the Burgh Engineer. Warrant was granted to Messrs. William Finlayson & Sons to erect two tenements at Piersfield, Piershill, and to the Lockhart Building Company to erect four houses on the west side of Craiglockhart Terrace.

THE Limerick Corporation recently made an application to the Local Government Board for a loan of 45,000*l*., under the provisions of the Housing of the Working Classes (Ireland) Act, and an inspector held an inquiry. It was proposed by the Corporation to erect 200 workmen's dwellings, and the necessary plans and details were submitted for approval. The Local Government Board have now consented to the erection of 100 workmen's dwellings on a revised scheme. It is uncertain if the Treasury will advance the money, in view of their refusal to grant, owing to the high city rating of 11*s*. 6*d*. in the £, a loan of 10,000*l*. for the erection of a technical institute.

PLANS and sections of the following proposed new buildings, &c., in Dundee, lodged at the office of the city engineer, were submitted to a meeting of the works committee of the Town Council, and were approved:—Arbroath Road, cottage for Geo. Patterson; Dundonald Street, mechanic shop for F. S. Sandeman & Sons; Hawkhill, hall for the Rev. J. H. Shepherd; High Street, Lochee, alteration on shop for Charles Batchelor; Lytton Street, skating rink for Wilbur Harlan; Old Glamis Road (off), shed for the trustees of the late John Johnston; Strathmartine Road, Downfield, additions to school for Mains and Strathmartine School Board.

VARIETIES.

THE Portsmouth Town Council are considering possible sites for a new elementary school to be erected at North End.

STRATTON workhouse, Wiltshire, is to be illuminated by electricity.

THE Carpenters' Company have arranged for a course of five lectures on sanitary building construction to be delivered at the Carpenters' Hall in October and November.

THE Greenock Corporation have, after visits to various towns, agreed to erect new mechanical filters, and have accepted the tender of Messrs. Bell Bros., Ravensthorpe, for the work, amounting to 6,280*l*.

THE Chertsey Rural District Council, Surrey, propose, subject to the consent of the Local Government Board, to present 50 guineas to Mr. W. Durrant, the surveyor, who is retiring after forty years' service.

THE sanitary committee of Bristol report that nine streets need reconstruction, and the cost of pitching eight of them and macadamising the ninth will amount to 4,917*l*., of which sum 1,000*l*. is recommended to be expended on Victoria Street, St. Philip's.

THE War Office has decided to carry out a searching inspection of all the barracks in the United Kingdom with a view to remedying sanitary and other deficiencies. It has long been notorious that some of the barracks were in urgent need of improvement, and in some cases of demolition. The cost of the work is to be spread over a number of years.

THE water supply arrangements of the town of Zanzibar are to be improved at a cost of 16,000*l*. The existing aqueduct is to be replaced by iron pipes, and a tower is to be erected at a short distance from the town, into which the water can be pumped, and from which it can be carried by gravitation into all parts of the town.

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The Rothesay Town Council at an unofficial meeting last week passed a resolution approving the erection of a building on the Front as a shelter. A plan was submitted for a glass and steel erection by the Falkirk Iron Company, which with verandah all round would cost about 4,000*l.*, and could be put up in five months.

The Barry District Council last week had before them the question of the development of Barry Island, when it was suggested that the surveyor should prepare plans and estimates for the construction of a sea wall, and that Mr. W. T. Douglass, M.Inst.C.E., Westminster, be also engaged to confer with the surveyor with reference to the scheme he had prepared three years ago. It was decided that four members visit other seaside resorts where sea walls have been built. Mr. W. T. Douglass was appointed consulting engineer.

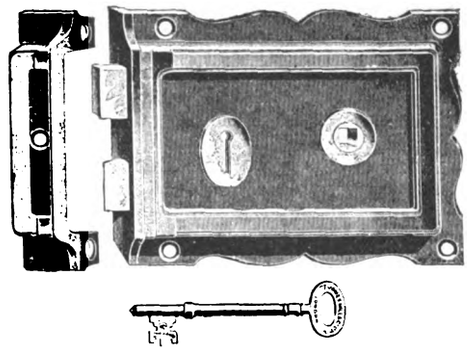
The streets committee of Kirkcaldy Town Council have had under consideration proposals submitted by Mr. W. Lockhart, C.E., with the purpose of providing a scheme of drainage to deal more adequately with the present requirements of the burgh, as well as to provide for the probable extension of the town within the next thirty or forty years. He also submitted several methods by which the present contamination of the beach by sewage could be avoided. Two schemes were submitted, the first being estimated to cost 34,000*l.*, and the other 19,000*l.* The committee decided to meet with Mr. Lockhart and discuss the question.

The opening ceremony of the Palmer's Green Congregational Church took place on Tuesday. The building, which is the first portion of a larger scheme and will eventually be used for school purposes, is designed in a later period of Gothic freely treated. The whole of the tracery work in the windows and other dressings are executed in Bath stone and the facings in red pressed Leicester bricks; the roof is covered with tiles; the internal joinery is carried out in oak; the heating, lighting and ventilation are carried out on the most modern and approved lines. The contract has been carried out by Messrs. Mattock Bros., of Wood Green, N., from the designs and under the superintendence of Messrs. George Baines & Son, of 5 Clement's Inn, Strand, W.C.

The "Harvard" House, Stratford-on-Avon, is to be opened as an American possession on Tuesday next by the American Ambassador. This half-timber house was erected in 1596 for Alderman Thomas Rogers, the grandfather of John Harvard, the founder of Harvard University, U.S.A. It was recently purchased by Mr. E. Morris, of Chicago, and after extensive and careful restoration it was presented by him to that University with a view to it becoming a museum of Harvard relics. Visitors will notice especially the fine raftered ceiling on the ground floor, and the beautiful Elizabethan oak-panelled room on the second floor, with its curious Tudor plaster mantel beading. For the opening ceremony on Wednesday the Great Central Railway Company are issuing special tickets available from London (Marylebone) to Stratford-on-Avon and return at a fare of 6*s.* 6*d.* by the express leaving at 10 A.M. and reaching Stratford-on-Avon at 12.21 P.M. The return from Stratford-on-Avon can be made at 4.35 P.M. or 7.27 P.M., reaching London at 6.43 and 9.55 P.M.

NOTES ON NOVELTIES.

Messrs. James Hill & Co., Ltd., ironmongers and hardware merchants, 100A Queen Victoria Street, E.C., are the original inventors of the reversible system for rim locks. We



here illustrate a new registered design. The lock is fitted with a new patent ball-bearing action, and is made in dull art black with brass bolts, or of brass entirely. It is worthy of mention that Messrs. Hill & Co. give a guarantee of

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Beg to intimate that they are prepared under the personal direction of Architects, to

BUILD, ALTER OR ENLARGE

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Waring's manufacturing resources enable them to satisfy Architects' requirements at the lowest tender prices.

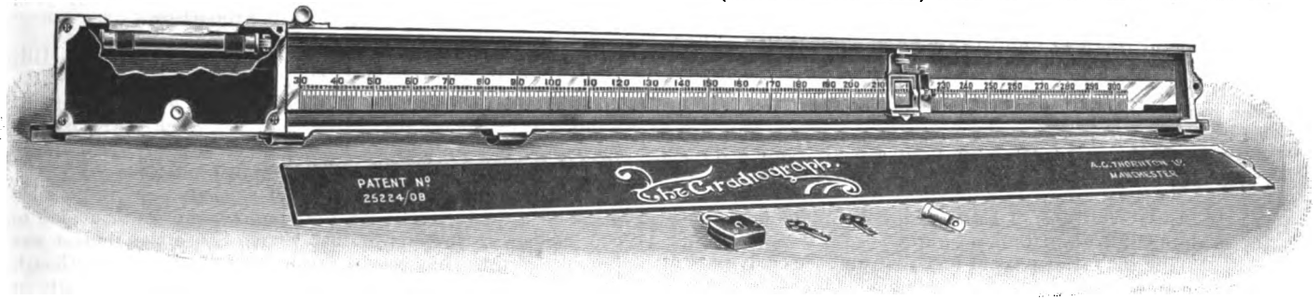
NEAR OXFORD CIRCUS, LONDON.

ALSO AT LIVERPOOL, MANCHESTER, AND PARIS.

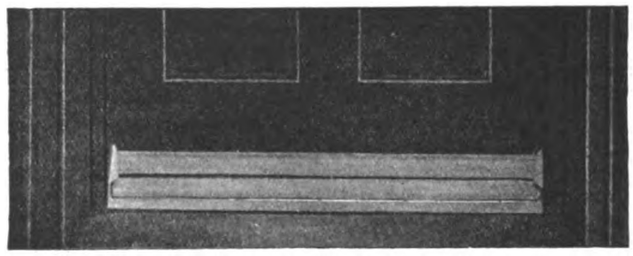
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twenty years' wear with all "E. C." ball-bearing locks, and undertake to repair any lock that has got out of order through faulty workmanship.

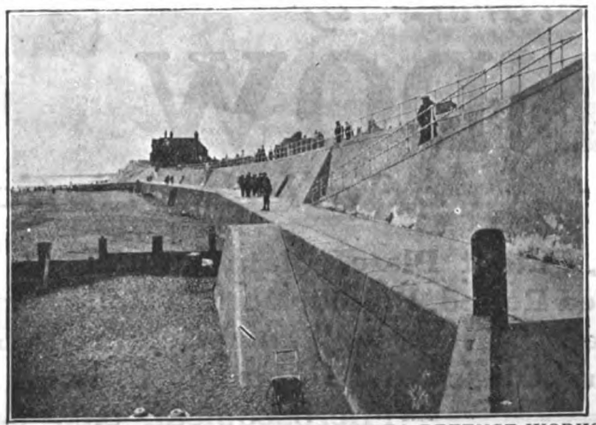
The "Gradiograph" is the name of an instrument for sewerage and other work made by A. G. Thornton, Ltd. Its primary purpose is for accurately setting out the levels of drains and sewers without recourse to the usual cumbrous system of sight rails and boning rods. Its over-all measurements are 36 inches by 3 inches by 1 inch in thickness, and the total weight is 7 lb. It consists of an elongated nickel aluminium casing of rectangular section. The casing inside is very accurately machined and adjusted. A perfectly graduated steelyard is pivoted towards one end at a point that coincides with zero, and is marked in units and half units, from 30 to 305; above the pivot and attached to it is a sensitive bubble. Travelling along the steelyard is a cursor or traveller which can be adjusted to any intermediate gradient, such as 1 in 98.7 or 1 in 296.8. At the extreme end is a notch or recess, and when the cursor is placed in this position the instrument is converted into a very reliable level for ordinary work. The Gradiograph has a range of gradients from 1 to 30 to 1 in 305, but the graduations on the steelyard can be arranged for different gradients. It is used on the invert of the pipe, and not on the outside surface, and is especially adapted for use where pipes are laid in a heading. Where a sewer or drain is laid by its use every individual pipe has exactly the same fall. Any irregularities on the invert are at once discerned, and can be allowed for in the laying. The instrument has already won much praise from many surveyors and contractors in the neighbourhood of Messrs. Thornton's works in Manchester.



Another draught excluder for outside and inside doors and windows has been put on the market by the Patent Draught, Damp and Dust Excluder Company, Kidwelly. The patent consists of an inverted V-shaped floor plate of brass (filled in with wood) fixed on to the threshold and in the door frame. This is overlapped by a sloping piece of brass screwed on to the door 3½ inches from the bottom. This curtain is itself in two interlocking pieces, the lower of which turns on an axis so that when the door opens inwards the lower brass tilts up and rides over the floor plate.



It is difficult to see how the cunningest draught, the hardest rain, or the finest dust could force a way past these defensive outworks. The fixed floor plate alone should prevent it, for it meets the doors about one-third of an inch from the bottom crack.

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BUILDING TRADE AND THE BUDGET.

The serious matter of unemployment in the building trade, resultant upon the socialistic Budget proposals of Mr. Lloyd George, has been already ventilated in the Press. Concrete proof, however, of how far-reaching and how deep-set is the trouble is afforded in a number of letters received from various firms in the building trade, extracts of which, published below, serve to indicate that the Budget has already thrown out of work about half the labourers employed upon building work in the vicinity of London. The letters have been received by the Budget Protest League at Caxton House, Westminster, S.W. In another part of this paper we print a statement published as the result of a conference in South London of builders, estate agents, and auctioneers.

Mr. A. A. Wellings, of Earlsfield, S.W., adds to his facts the subjoined all too patent prophecy:—

"During the latter part of last year and the early part of this year I was financing four builders, who in return employed some 600 men. At the present moment only some 110 men are employed; the others have had to be dismissed and in most cases are swelling the ranks of the unemployed. Last year I purchased three small estates amounting in all to about 10,000*l.*, but in the light of proposed drastic legislation it is not my intention to purchase further building estates, although land is considerably depreciated in value since the introduction of the Finance Bill. Owing to the inactivity in the building trade I am confident that there will be more distress among the working classes this year than in any previous year."

Mr. Bertram T. Rumble, Manager and Secretary of the Merton Park Estate Co., of Merton, writes:—

"As perhaps you are already aware, my company are the owners of between 500 and 600 acres of land in this parish apart from the existing house property, which is considerable, and my directors decided that in view of this Budget, which will weigh so heavily upon them, they could not possibly continue building. In fact, the buildings which were in the course of construction have been stopped, and proposed buildings held in abeyance, until something is definitely known with regard to the Land Clauses in the Finance Bill. I may also mention that my company have had a considerable number of applications for land and houses, and in view of the provisions of the Bill they have not felt inclined to carry these negotiations through.

"The shrinkage of labour on this estate caused by my directors' decision is practically 80 per cent.—that is to say, whereas we were employing a number of bricklayers, carpenters, plumbers, labourers, &c., we are now employing only decorators on the already built properties."

Owing to large contracts at Aldwych and Mill Hill, Messrs. C. Rawley Cross & Co., of Chancery Lane, W.C., are not yet so seriously affected as they apprehend to be later. Nevertheless they have been compelled by the Budget to reduce the number of hands they employ on building operations from some 400 to between 200 and 250:—

"At a rough guess we should say we were responsible directly and indirectly for the employment of about 350 to 400 men up to the end of last year. Since the Budget was introduced there has been a considerable falling-off, although at the moment we are busier, as we are covering a site in Aldwych and are erecting some thirty or forty houses at Mill Hill. We should say that altogether there are not more than 200 to 250 employed. We have certainly not bought any land since the Budget was introduced, and should be only too glad to get out of what we hold. In reply to other questions, business is bad."

Mr. Edwin Evans, of Lavender Hill, in the course of his letter on the subject, states the case very succinctly:—

"I have had some figures taken out for the first eight months of this year for the purpose of comparison with those for a similar period of last year. I find that there is a diminution of about 20 per cent. This proportion will be greatly increased as time goes on, because we usually purchase some 200,000*l.* worth of land per annum, and we are not buying now in consequence of the iniquitous Budget proposals. Should the Finance Bill ever be placed on the Statute Book, its operation would reveal the fell intent of the Government in all its nakedness, and the country would realise the true character of a Socialist Government."

Messrs. Swain & Selley, of Streatham, append to their letter the following brief statement of what the Budget has already done in reducing employment with them, and what

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The new Opal Tiles of lustrous surface with clean cut edges.
SAMPLES SENT ON APPLICATION.

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its effect will be in December. The figures speak so plainly for themselves that comment in the premises seems superfluous:—

Average number of men employed for five years previous to April, 1909	200
Present number actually employed	100
Estimated number at present without Budget proposals	200
Anticipated number in December 1909 ...	60
Estates bought	None
Sales	Bad

Mr. Henry Watts writes of his own case as follows:—

"I can assure you that at the present time I do not employ one half the number of men I was employing six months ago; for instance, in the second week in March last my wages account was 178*l*. 13*s*. 4*d*., whereas in the second week of this month it was 85*l*. 7*s*. 8*d*.; the number of men employed in March last was about eighty-nine, and the number of men this month about forty-three, so that this means a falling off of forty-six men; in fact, if it were not for keeping on old hands I should feel inclined to close my building operations entirely. In my opinion the proposed Budget is the cause of this slackness of business. Apart from this, I consider that the proposed increment duty on land will so affect future transactions that I shall have to consider my position fully before taking further land for development, as risks would be increased 20 per cent. I have had parcels of land offered to me at a price that in normal times I should have had no hesitation in dealing with, but, with the additional risks and with such a slump in business generally, it would be madness to entertain any further responsibilities until matters are more settled."

In the course of a letter giving other details on the subject, Mr. F. C. Coad, of Carminia Road, Upper Tooting, writes of the Budget:—

"I may add that bad as it would be for both developer and builder, it will be far worse for the actual worker, and I hate to think of the coming winter. I had an experience last winter. I never thought I should see so many starving men begging for work as I saw then, but I am afraid this winter will be much worse."

LONDON MASTER BUILDERS' ASSOCIATION.

The usual monthly meeting of the Council was held on Thursday, 16th ult., presided over by the President, Mr. F. G. Rice.

The President reported to the Council upon the visit of Belgian Master Builders to London and the steps taken to make the visit a pleasant and useful one. Much gratification was expressed at the results, and the Council passed a vote of thanks to the President and sub-committee for their successful arrangements of the receptional dinner given to the visitors, numbering about 100, at the St. Ermin's Hotel, Westminster, when a good many members of the London Master Builders' Association and ladies were present. The following telegram, received from the President of the Antwerp Association of Master Builders, was read:—

"Dover Pier: August 15, 1909.

"To Mr. Rice, president London Master Builders' Association,—Before leaving England the Belgian master builders wish to send to your association their brotherly salute with the expression of their feeling of gratitude for your kind reception, which they will remember for ever.—Heisbain."

The chairman of the organisation committee (Mr. F. Higgs) reported to the Council the recommendations of this committee, which, after considerable discussion, were agreed to and instructions issued to give due effect to their adoption.

In response to an invitation from the president of the Quantity Surveyors' Association the president (Mr. F. G. Rice), Mr. Frank May, Mr. Benjamin I. Greenwood, and Mr. G. Bird Godson were selected to represent the L.M.B.A. at a conference, *re* tendering without quantities being supplied, on Wednesday, October 13.

Legal matters of considerable importance to the trade were discussed and referred to the solicitor for consideration and report.

The secretary reported that the new agreement between the National Federation of Building Trade Employers and the National Association of Operative Plasterers was signed by the respective delegates with the following provision required by the Council of the L.M.B.A. duly inserted:—

"That it be an instruction in signing the amended

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Old Satinwood narrow Pedestal China Cabinet, 1 ft. 10 in. wide by 4 ft. 8 in. high. Original price £8 10 0 To be cleared at £4 18 6



Magnificently made and finely finished Jacobean Sideboard in waxed Walnut, fitted with numerous cupboards and drawers and beautifully carved frieze and mouldings, 7ft. wide. Original Price .. £55 0 0 Offered for £38 10 0

This Sideboard was manufactured by the celebrated firm of Smee & Co., New Bond Street.

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general rules that it be done with the understanding with the operatives that the present rules between the L.M.B.A. and the N.A.O.P. be thereby not superseded."

A letter was read from the Carpenters' Company with reference to their exhibition of wood work in 1910, and instructions given.

TRADE MARKS OF CONSTRUCTIVE MANUFACTURERS.

We have received from L'Agence de Brevets et Marques de Fabrique, Jacques Gevers et Co., 70 Rue Saint-Jean, Antwerp, the following list of trade marks, published in July-August 1909:—

SWEDEN.

Construction.

"Reliance" . .	Stockholms Benmjölsfabriks-Aktiebolag, Stockholm.

BELGIUM.

Construction

Under the heading of "Cement" 900 trade marks have been deposited.

"Piedra Movediza"	Sainte-Ame, Les Etablissements Américains, à Courtrai.
"Nations Portland Cement Works"	Emile Grevisse, Antoing.

Ciment, Chaux et tous Produits Similaires.

"Drapeau National"	(G. L.) Louis Volkaerts, Antwerp.
"Works Braud" .	(Volkaerts, Louis), Louis Volkaerts, Antwerp.

Matériaux de Construction et spécialement pour Dalles.

"Durcit" . .	François de Keersmaecker, Antwerp.

Mâts en Béton Atme.

"Saxonla-Mast" .	Rudolf Wolle, Leipzig (Germany).

FRANCE.

Construction.

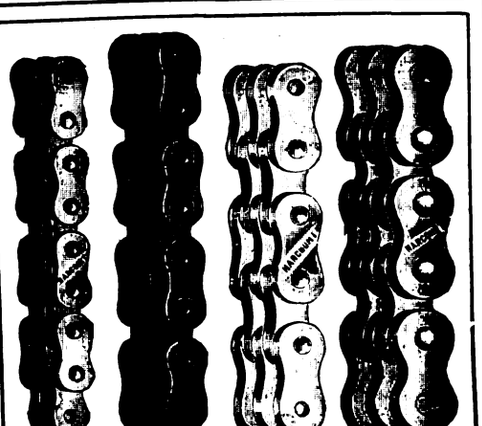
"Clef" . . .	MM. Lange et Durand, Angers.
"Construction Surprise" .	M. Edmond Deroche, Rennes.
"Ruberoid" . .	Société Anonyme de Toitures et Isolants, Paris.
"Lithomac" . .	M. Henry Daniel Blake, à Annecy, Overhill Road, Lordship Lane, London.
"Gemaline" . .	M. Charles Durand, 15 rue Decamps, Paris.
"Ivanhoe" . .	Henry Rossell & Co., Ltd., Sheffield.
"Boro-Carbone" .	Société Anonyme le Boro-Carbone, 8 rue Nouvelle, Paris.

The Reading education committee have received the approval of the Board of Education to the plans for new class-rooms and alterations to the main block at Reading school; also sanction to a loan of 3,283*l.* for the building of the junior school.

Among the amendments to the Housing and Town-Planning Bill which Lord Camperdown put down was the following clause to define the working class:—"The expression 'working class' throughout the Housing Acts, unless the context otherwise requires, shall mean mechanics, artisans, labourers and others working for wages, hawkers, costermongers, persons not working for wages but working at some trade or handicraft without employing others except members of their own family and persons whose income does not exceed an average of 30*s.* a week and such persons as may be residing with them."

Last week at Loughlinstown workhouse, Mr. Francis J. M'Carthy, Local Government Board Inspector, conducted the inquiry into an application by the Rathdown (No. 1) Rural District Council for a loan of 28,200*l.* to be expended upon the erection of 119 labourers' cottages in various electoral divisions of the district, and attaching suitable plots of land to each cottage.

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WATER-PROOF. ROT-PROOF. INSECT-PROOF.
For UNDERLINING Slates, Tiles, Iron Buildings, with or without Boards. For LAYING ON JOISTS. Placed under Floor Boards EXCLUDES DAMP and DEADENS SOUND. Also for Damp Walls.
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HARCOURTS' (LD.) PATENT
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MADE of COPPER with C.M. RIVETS.
WORKS SMOOTHLY AND NOISELESSLY.
— NO COGS NEEDED. —
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AMONG MANY OTHER PLACES:
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The "Scotsman," Edinburgh.
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The Post Office, Montreal.
The New Lunatic Asylum, Bristol.
The Houses of Parliament, Brisbane.
The Holborn Viaduct Buildings, London.
The New Library, Pollokshields.
The Asylum, Letterkenny.
The Dykebar Asylum, Paisley.
The Metropolitan Carriage Works, Saltley.
The Royal Artillery Barracks, Manchester.
The Cottage Hospital, Walsall.
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The Stores of A.T. Stewart, Esq., New York.
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THE HOUSING OF NAVVIES.

(Concluded from last week.)

Colonies of navvies may be the means of importing and spreading infectious disease. There is especial danger in respect of small-pox, to the infection of which navvies are particularly liable.

The Labour Market for Public Works.—The highly mobile condition of this industry and the lack of proper organisation seriously affect the problem under discussion. Employment on public works is of necessity subject to marked fluctuations in respect of time, place, and seasonal conditions, but the difficulties thus arising are needlessly enhanced by the fact that no properly collected and co-ordinated information as to employment can be obtained, and the supply of labour is left very much to chance.

A strong and steady navvy can, as a rule, obtain work readily enough, but although the supply of casual and irregular labour is in excess of the demand, it is often difficult for a contractor in the present absence of properly organised information to obtain a sufficient supply of competent labour. Hence, in order to ensure a reserve on which to draw, some contractors allow advertisements to remain in the "Labour News" even after the requisite number of men have been obtained, and in some cases good workmen are attracted only to find that their services are not required.

Need for a Labour Exchange.—In no other industry is the need for the regularisation of employment by means of a national Labour Exchange more plainly manifest.

The following are the sections in the Port of London Act referring to the engagement of casual labour:—

Section 6.—(1) (ii) An order authorising the construction of new works shall impose on the Port Authority an obligation to provide such housing accommodation for the persons to be employed at the new works when constructed as the Board of Trade may from time to time consider requisite.

Section 28.—(1) The Port Authority shall take into consideration the existing methods and conditions of engagement of workmen employed in dock, riverside, and warehouse labour in connexion with the Port of London, and shall, either by themselves or in co-operation with other bodies or persons, by establishing or maintaining or assisting in the establishment or maintenance of offices, waiting-rooms, and employment registers, and by the collection and communication of information and otherwise, take such steps as they think best calculated to diminish the evils of casual employment, and to promote the more convenient and regular engagement of such workmen or any class thereof:

Provided that nothing in this section shall deprive any person of any legal right which he would otherwise possess with regard to the engagement of labour.

(2) The Port Authority may make bye-laws with respect to admission to, and the maintenance of order in, such offices and waiting rooms, and otherwise for the purpose of carrying this section into effect.

A Bill to provide for the establishment of Labour Exchanges is now before the House of Lords, having passed the House of Commons.

Cheap Railway Fares.—Having no trustworthy means of finding out where work is to be obtained, many navvies (perhaps the majority) now tramp from one public work to another on the strength of vague rumours. This statement applies not only to shiftless and casual workers, but even to strong and steady men, who, though their chance of obtaining work may be good, yet do not care to expend money on railway fares unless they can be certain of employment. To be able to secure engagement by means of a Labour Exchange, and to be forwarded cheaply by rail to where their services are required, would be a great boon to this class.

"*Subbing.*"—One of the worst influences affecting the moral and social conditions of navvies is the practice of "subbing," or paying instalments of wages daily, or at short intervals, instead of the whole wage weekly or fortnightly. The practice came into vogue when wages were paid at monthly intervals. Wages are now, as a rule, paid weekly, but men are often allowed to "sub" daily to within 6*d.* or less of the full amount due to them, a few pence being withheld in order to keep the workman's name on the pay-sheet. When men arrive penniless on public works it is necessary that they should at first receive an instalment of their wages to enable them to obtain food and lodgings, but this advance is not required by steady men after the first week, or, at most, two weeks.

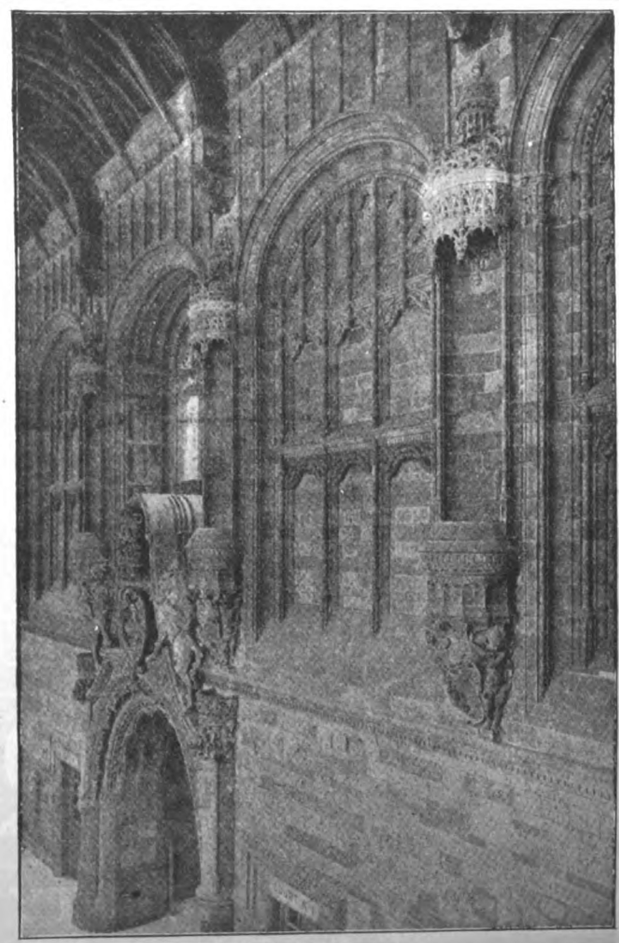
Some of the best contractors refuse to "sub" after the first week, and in consequence generally retain a superior class of men on their works.

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Recommendations.

1. That every corporate body or contractor intending to commence works of public construction involving the employment of navvies, on which any number of workmen exceeding 100 not previously resident within three miles of the works shall be employed, should be obliged to notify the Local Government Board, and also the County Council, or the sanitary authority of the district of such intention, not less than fourteen days before the commencement, indicating the general scope and the probable duration of the work, and approximately the number of workmen it is intended to employ. If at any subsequent date a larger number of workmen shall be employed than were specified in the original notification, a further notification specifying approximately the number should be made. On the completion of such works the central and local authorities should again be notified.

2. That such works should from time to time be open to inspection by inspectors of the Local Government Board.

3. That contractors should endeavour to arrange with the railway companies for the granting of specially cheap fares to workmen.

4. That workmen should, if necessary, receive instalments of their wages during the first fortnight of their employment, but that after this time wages should be paid weekly, and that no contractor should advertise "Sub Daily" as an inducement to attract labourers to any work.

5. That any employer of labour on works of public construction who shall employ any number of workmen exceeding 100 not previously resident within three miles should, unless sufficient and satisfactory accommodation already exists, be obliged to provide accommodation to the satisfaction of the County Council or the District Council. The temporary buildings to be provided should, unless the duration of the work is likely to be very short, include buildings sufficient for the isolation of cases of infectious disease that may occur among the workmen or their families.

Temporary buildings provided should be registered by the County Council or the District Council, and should be open to inspection by either of these bodies.

If, however, temporary buildings be erected within three miles of any part of the works, for the accommodation of workmen by private persons, these may, if approved by the County Council or the District Council, be accepted in lieu of provision made directly by the contractor or employer.

6. The medical officer of health for the district should, when such temporary buildings are first erected, and afterwards from time to time, examine and report whether in respect of construction, lighting and ventilation, water-supply, drainage, and excrement and refuse disposal these buildings are of a satisfactory character, and whether the cubic accommodation of the sleeping apartments affords not less than 300 cubic feet of free air-space for each occupant.

7. The provision of the necessary temporary buildings should, unless the duration of the work is likely to be very short, include the provision of a suitable room for recreation.

8. Temporary sheds in which meals can be taken and food warmed should be provided.

9. On all works on which more than, say, 200 men are employed a canteen should be provided in which light refreshments and non-intoxicating liquors may be sold. If intoxicating liquors are sold the manager should receive no profit on and have no interest in the sale.

10. No intoxicating liquors should be allowed to be sold in any temporary building other than the authorised canteen.

11. A clause requiring the provision of accommodation on the lines above laid down should as far as practicable form part of all contracts and all Acts of Parliament authorising public works of construction.

The Limerick District Council are considering a scheme for the erection of a bridge across the river Shannon at Castleconnell at a cost of 12,000*l.*

The Newcastle-on-Tyne Board of Guardians have agreed upon the expenditure of 11,700*l.* on the extension of the cottage homes at Pontelands.

A site has been purchased in Pinner Road, Oxhey, near Watford, Herts, for the erection of a parish hall.

Plans for an extensive improvement of the Worthing pier have been approved by the Town Council.

Plans submitted by the Rev. G. F. Eyes, M.A., for a new church of St. Philip's, Swan Lane, Bolton, have been approved.

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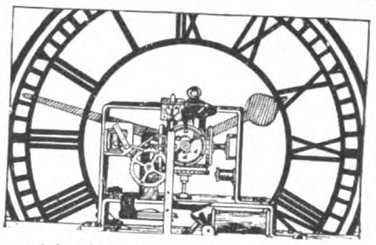
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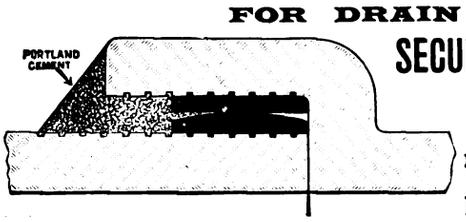
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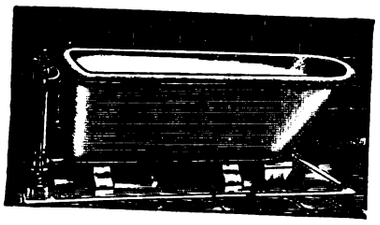
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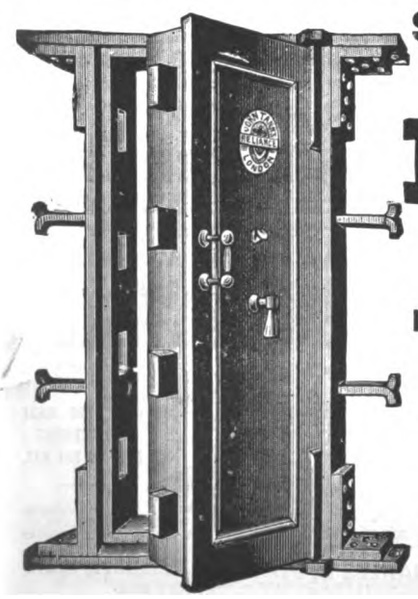
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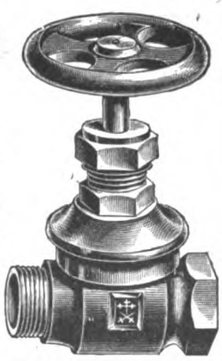
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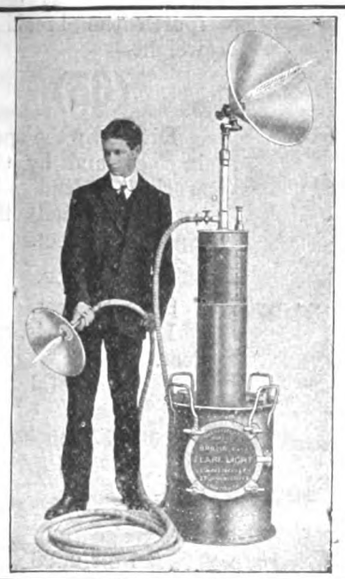
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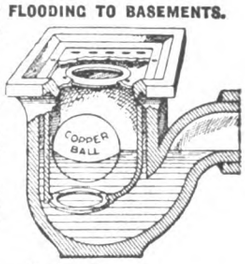
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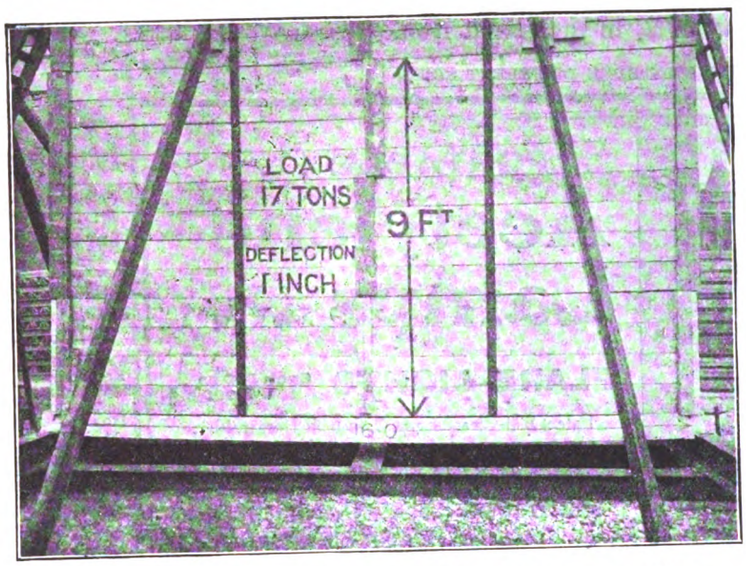
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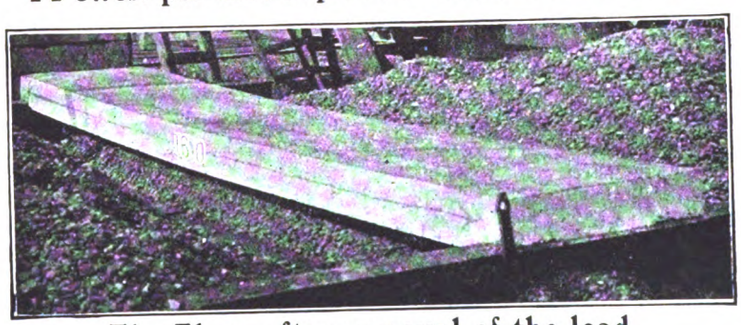
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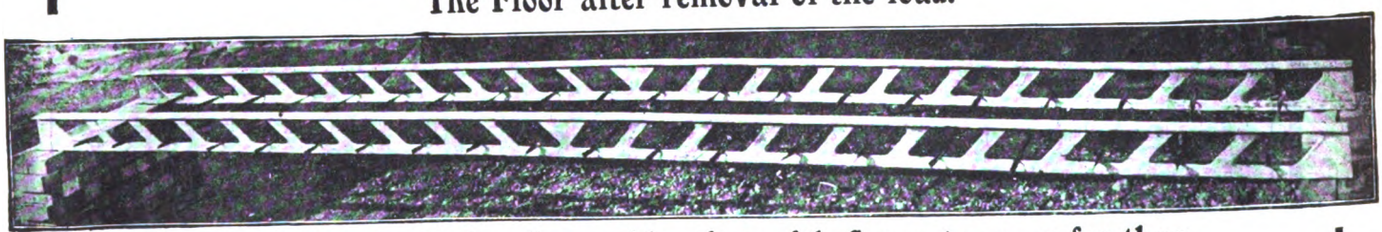
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15)63·0(4·2
60
30
30

1·5)4·2(2·8
30
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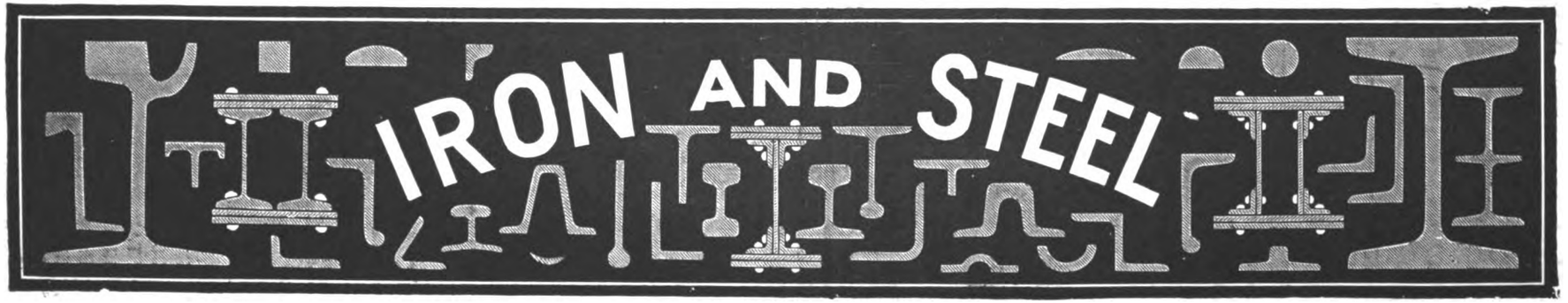
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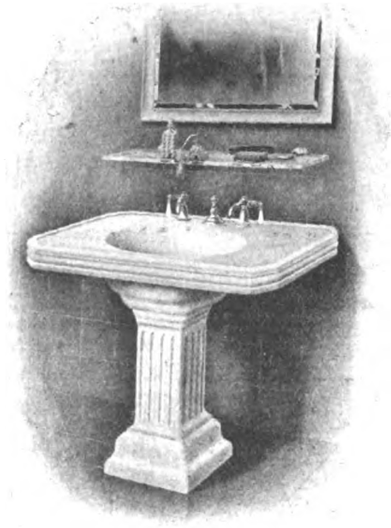
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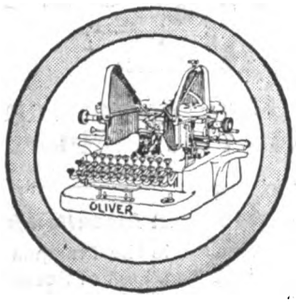
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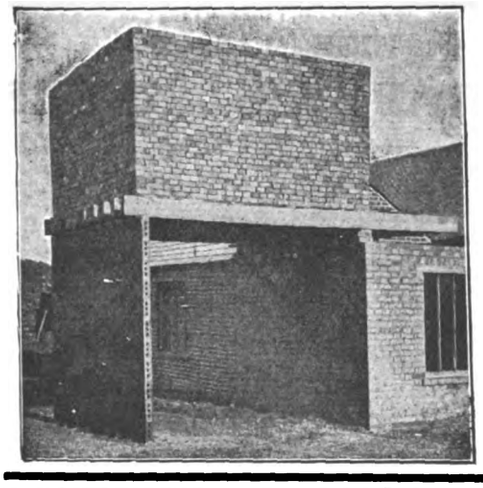
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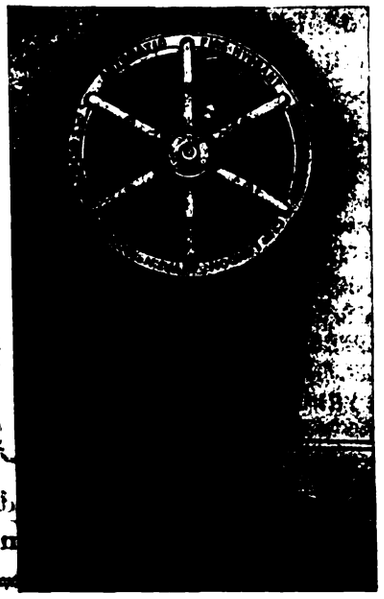
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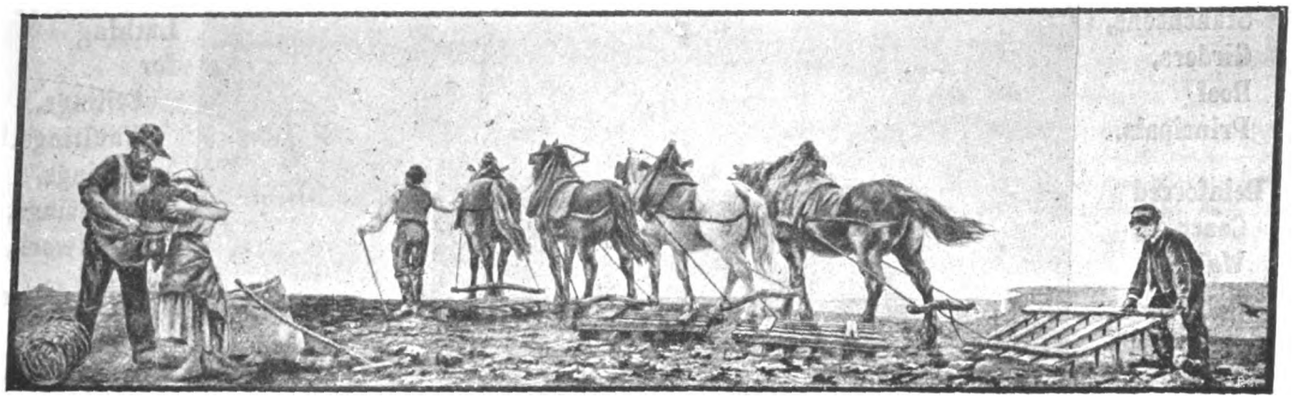
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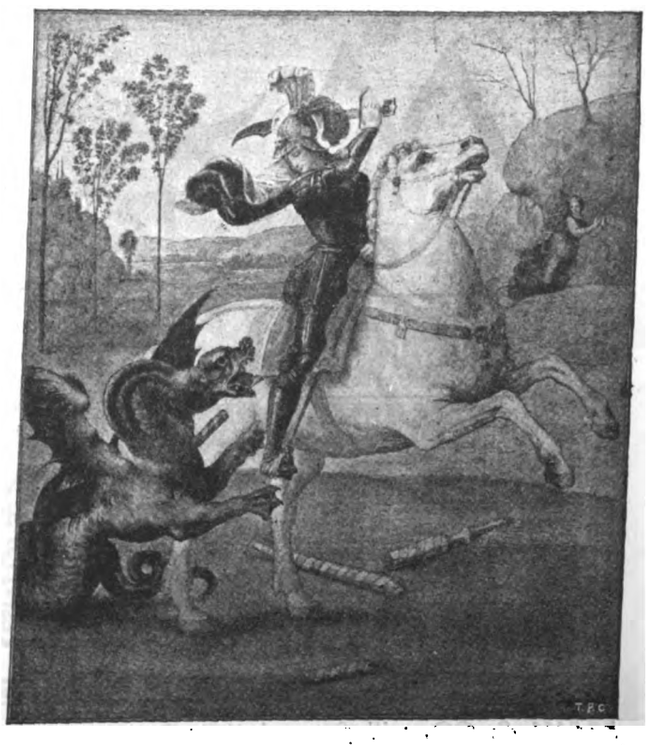
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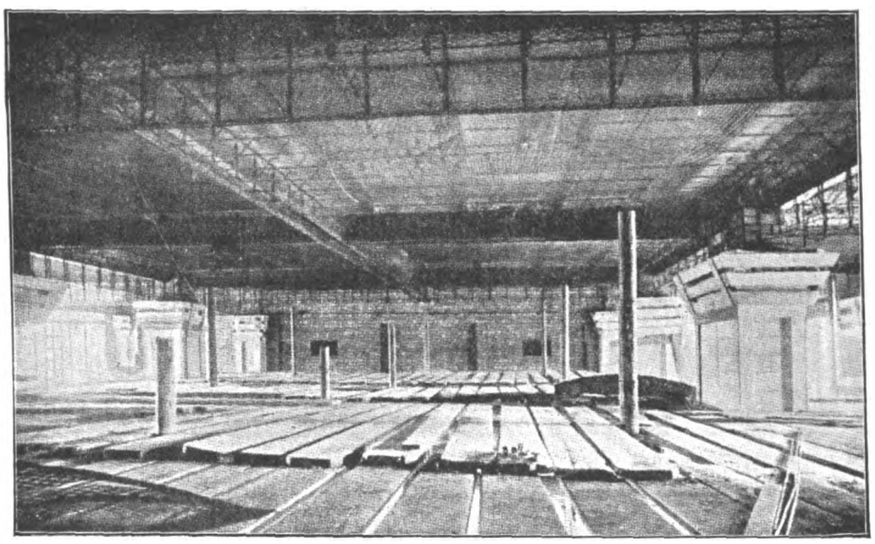
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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

HULL.—Oct. 18.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

KENDAL.—Nov. 1.—The Corporation invite architects residing and practising in Westmorland to submit designs with description and estimate of a technical school. Premiums of 15*l.*, 10*l.*, and 5*l.* are offered.. The Borough Surveyor, Kendal.

LEEDS.—Dec. 18.—The education committee invite architects practising in Leeds to submit designs for proposed training college for teachers, Kirkstall Grange, Far Headingley. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist the committee. Deposit 2*l.* 2*s.* Mr. James Graham, Secretary for Education, Education Department, Leeds.

PRESTON.—Nov. 1.—The Corporation invite designs for a boys' grammar school. Premiums of 50*l.*, 30*l.* and 20*l.* Mr. Alfred Howarth, town clerk, Town Hall, Preston.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

WORKINGTON.—Nov. 30.—The Cumberland education committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the borough of Workington, Cumberland, for about 300 pupils of both sexes. Deposit 1*l.* 1*s.* Mr. C. Courtenay Hodgson, secretary, The Courts, Carlisle.



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CONTRACTS OPEN.

Bardsea.—Oct. 16.—For erection of a police dwelling at Bardsea, near Ulverston, Lancashire. Deposit 1*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Bath.—Oct. 26.—For erection of ten or more dwellings for persons of the labouring classes, in Middle Lane, Dolemeads. Deposit 2*l.* 2*s.* The City Surveyor's Office, Guildhall, Bath.

Bedlington.—For the erection of a vicarage for St. John's, Sleekburn. Mr. A. B. Plummer, F.R.I.B.A., diocesan architect, Newcastle-on-Tyne.

Birmingham.—Oct. 15.—For erection of a laundry at the workhouse, Dudley Road. Apply by October 2. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

Bletchingley.—Oct. 14.—For erection of a dining hall, &c., at the Workhouse, Bletchingley, near Redhill. Mr. George E. Crowter, Surveyor's Office, Godstone.

Bradford.—Oct. 16.—For alterations to Turkish and medicated baths at the Central Baths. The City Architect, Whitaker Buildings, Brewery Street, Bradford.

Bradford.—Oct. 12.—For the following works, for the Guardians:—(1) Builders' work, all trades, to be let in one contract; (2) atmospheric steam heating engineer's work; (3) boilermaker's work, in connection with extension to the boiler house and the system of steam-heating at the Union workhouse, Horton Lane. Deposit 1*l.* 1*s.* The Engineer and Architect to the Board, Architect's Department, 22 Manor Row, Bradford.

Broughton.—For various works required in erection of a Wesleyan chapel and school at Broughton, near Salisbury. Messrs. W. J. Morley & Sons, 10 Craven House, Kingsway, London, W.C.

Bury St. Edmunds.—Oct. 12.—For preparing site, building foundations, laying drains, &c., for the proposed sanatorium. Mr. Walter D. Harding, A.M.I.C.E., Town Hall, Bury St. Edmunds.

Crewe.—Oct. 9.—For additions and alterations to the Bedford Street schools. Deposit 2*l.* Mr. G. Eaton-Shore, borough surveyor, Municipal Offices, Earle Street, Crewe.

Cuxton.—Oct. 11.—For erection of a cattle-cake mill at Cuxton, near Rochester. Deposit 1*l.* 1*s.* Messrs. Ruck & Smith, architects, 86 Week Street, Maidstone.

Darlington.—Oct. 11.—For the whole or any portion of the various works required in pulling down old premises in Blackwell Gate, and the erection and finishing of new business premises, comprising two shops, show-room, work-rooms and dwelling house. Messrs. Hoskins & Brown, architects, Court Chambers, Darlington.

Dartford.—Oct. 13.—For the conversion of Old Bank House into offices and the construction of a council chamber and incidental works. The Surveyor, Council Offices, Dartford.

Dewsbury.—Oct. 13.—For the various works required in the conversion of a warehouse into shops, Bradford Road. Messrs. Kirk, Sons & Ridgway, F.R.I.B.A., architects, surveyors and valuers, Market Place, Dewsbury.

Durham.—Oct. 19.—The Durham County Council invite sole tenders, as follows:—(1) For erection of Trimdon Grange school (450 scholars), Mr. W. Rushworth, Shire Hall, Durham; (2) For erection of Fatfield school (250 scholars), and extensions at Seaham Harbour Council school (588 scholars). Mr. F. E. Coates, Shire Hall, Durham.

Eccleshill.—Oct. 11.—For the several works required in erection of a large weaving shed at the Union Mills, Eccleshill, near Bradford. Messrs. Mawson & Hudson, architects, Exchange Buildings, Bradford.

Egham.—Nov. 8.—For erection of an isolation hospital upon land at Northcroft Road, Englefield Green, for the Egham Urban District Council. Deposit 2*l.* 2*s.* Send in names by October 11 to Mr. Walter Gray, architect, Westwood, Egham Hill.

Evesham.—Oct. 16.—The Town Council of the borough of Evesham are prepared to receive tenders from persons or firms who have had experience in the construction of ferro-concrete work, for the construction of a reinforced concrete

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roof, supported on columns, &c., of the same material, for their new open service water reservoir (capacity 2,000,000 gallons). The Borough Surveyor's Office, Town Hall, Evesham.

FALMOUTH.—Oct. 12.—For erection of a detached villa on the Gyllyngdune Estate. Mr. H. E. Tresidder, P.A.S.I., A.I.S.E., architect, 23 Church Street, Falmouth.

FARNLEY, NEAR LEEDS.—Oct. 15.—For the construction of a small service reservoir and pump-house at Farnley, near Leeds. Deposit 1*l.* 1*s.* Mr. Chas. G. Henzell, M.I.C.E., waterworks engineer, Leeds.

GRIMSBY.—Oct. 20.—For erection of a Council school in Strand Street. Deposit 2*l.* 2*s.* Apply by October 14 to Mr. Herbert C. Scaping, architect, Court Chambers, Grimsby.

HANDLEY.—Oct. 16.—For repairs, alterations and additions at Thorney Down Farm, Handley, Dorset. Messrs. Fletcher, Son & Brett, Wimborne.

IRELAND.—Nov. 1.—For the erection of Central Technical Institute, Military Road, Limerick. Deposit 1*l.* Mr. James MacKay, quantity surveyor, 58 Dame Street, Dublin, and 82 South Mall, Cork.

IRELAND.—Oct. 15.—For erection of Soldiers' Home at Newbridge, Co. Kildare. Deposit 1*l.* 1*s.* Messrs. W. H. Stephens & Sons, 13 Donegall Square North, Belfast.

KING'S HEATH.—Oct. 13.—For erection of a shelter in the King's Heath Park, near Birmingham, for the King's Norton and Northfield Urban District Council. Deposit 1*l.* 1*s.* Mr. Ambrose W. Cross, surveyor, 23 Valentine Road, King's Heath.

LEEDS.—Oct. 15.—For the construction of a small service reservoir and pump-house at Farnley, near Leeds. Deposit 1*l.* 1*s.* Mr. Chas. G. Henzell, M.I.C.E., waterworks engineer, Leeds.

LICHFIELD.—Oct. 11.—For erection of Christ Church mixed and infants' schools. Deposit 2*l.* 2*s.* Send names to Mr. Fred T. Beck, architect, Wulfrun Chambers, Darlington Street, Wolverhampton.

LINCOLN.—Oct. 14.—For alterations and additions to a farm house, cottages and farm buildings, at the Midville House Farm. Send names to Messrs. Mortimer & Son, architects, Lincoln.

LONDON.—Oct. 22.—For erection of mortuaries and post-mortem room, for the Poplar Borough Council. Deposit 2*l.* 2*s.* Mr. Harley Heckford, A.M.I.C.E., borough surveyor, Council Offices, High Street, Poplar.

LONDON.—Oct. 13.—For the erection of a disinfector house at the North Eastern Fever Hospital, St. Ann's Road, Tottenham, N. Deposit 1*l.* Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief, the Metropolitan Asylums Board, Embankment, E.C.

LONDON.—Oct. 18.—For renovation of the corridors, cloak rooms, and cookery centre, and for the provision and fixing of cloak room fittings at the Long Lane Council school, East Finchley. Deposit 1*l.* Mr. C. J. Jenkin, Surveyor's Department, Council Offices, Finchley, N.

LYE.—Oct. 29.—For erection of a Council elementary school, in Valley Road, Lye, Worcestershire. Deposit 2*l.* 2*s.* Send names by October 13 to the County Education Office, Worcester.

MIDDLESBROUGH.—Oct. 20.—For the whole of the works required in the erection of the Kirby secondary school. Deposit 2*l.* 2*s.* Send names to Mr. A. Forrester, architect, 141 High Albert Road, Middlesbrough.

MIDDLETON.—Oct. 13.—For erection of a secondary school in Rectory Street, Middleton, Lancs. Deposit 3*l.* Mr. Henry Littler, county architect, 6 Ribblesdale Place, Preston.

MIDDLETON.—Oct. 16.—For the erection of sanitary conveniences near the Fountain. Mr. W. Welburn, borough surveyor, Town Hall, Middleton.

MYTHOLMROYD.—Oct. 9.—For erection of a porch and other works at the headteacher's house at the Mytholmroyd Scout Road schoolhouse, for the Hebden Bridge education subcommittee. Mr. Richard H. Whitworth, divisional clerk, Education Offices, Sowerby Bridge.

NEWCASTLE-ON-TYNE.—For erection of new parochial buildings for St. Barnabas. Mr. A. B. Plummer, F.R.I.B.A., diocesan architect, Newcastle-on-Tyne.

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Newton Heath.—Oct. 11.—For the erection of the Brookdale Park municipal school, Newton Heath, Manchester. Deposit 2*l.* 2*s.* The Education Offices, Deansgate, Manchester.

Pickering.—Oct. 18.—For addition to the Pickering Grammar school, Yorks. Deposit 1*l.* Mr. John Bilson, architect, 23 Parliament Street, Hull.

Portsmouth.—Oct. 11.—For supplying and erecting in the grounds of the infectious diseases hospital at Milton a portable corrugated-iron isolation hospital, capable of holding sixteen beds. Mr. G. Hammond Etherton, town clerk, Town Hall, Portsmouth.

Radcliffe (Lancs.).—Oct. 23.—For the construction, erection, and completion of a footbridge over the river Irwell, from Lomax Street to Cawdaw. Deposit 1*l.* 1*s.* Mr. W. L. Rothwell, engineer to the Council, Council Offices, Radcliffe.

Rawmarsh.—Oct. 15.—For additions and alterations to the Ryecroft Branch Stores, Rawmarsh, Yorks. Mr. J. Platts, architect, High Street, Rotherham.

Reading.—Oct. 14.—For alterations and additions to their board room and offices, 32 Thorn Street, Reading, for the Guardians. Send names by October 9 to the Clerk, 32 Thorn Street, Reading.

Rotherham.—Oct. 18.—For the Rotherham court-house alterations, &c. Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

Rotherham.—Oct. 9.—For alterations to the boundary wall at the nurses' home in Alma Road. The Workhouse Master, Rotherham.

Saffron Walden.—Oct. 16.—For erection of an additional class-room with rooms over and adjoining thereto, and for alterations to the existing buildings, at the King Edward VI. Grammar School. Mr. M. C. Robinson, architect, Wenden, Saffron Walden.

Scotland.—Oct. 9.—For the mason, carpenter, slater, plasterer, plumber, electric lighting, and painter and glazier works of institute buildings, Rose Street, Aberdeen, for the Aberdeen Deaf and Dumb Benevolent Society. Mr. George Bennett Mitchell, architect, 148 Union Street, Aberdeen.

Scotland.—Oct. 14.—For the mason, carpenter, slater, plumber, plaster, painter and glazier works of excise officer's house to be built at the Glenlossie-Glenlivet Distillery, Elgin. Mr. Charles C. Doig, architect, Elgin.

Strood (Kent).—Oct. 13.—For erection of a steam roller house at Cobham, for the Strood Rural District Council. Deposit 10*s.* 6*d.* Mr. L. Randerson, district surveyor, Meopham, Gravesend.

Wales.—Oct. 11.—For works of improvement and alterations to the Cwmdu Council school, Newtown (Montgomery), and for a proposed new water supply. Deposit 1*l.* 1*s.* The County Education Offices, Newtown.

Wales.—Oct. 16.—For erection and completion of a new hall at St. Dogmaels, Cardigan. Mr. J. Teifion Williams, architect, Napier Street, Cardigan.

Wales.—Oct. 13.—For erection of new chapel at Glyn neath. Apply at Pencaerau House.

Wales.—Oct. 12.—For the excavation for formation of site, building of boundary retaining walls, formation and making of roads, and for erection of ten houses at Snatchwood, Abersychan. Mr. A. Gordon Babbage, architect and surveyor, Clarence Chambers, Pontypool.

Wales.—Oct. 11.—For erection of a mixed school and altering present mixed and infant schools at Capcoch, near Aberdare. Deposit 2*l.* 2*s.* Mr. John Morris, director of education, Education Offices, Aberdare.

Wales.—Oct. 14.—For erection and completion of riding school, drill hall, and headquarters for the Glamorgan Royal Horse Artillery at Port Talbot. Deposit 1*l.* 1*s.* Mr. W. H. Dashwood Caple, F.R.I.B.A., 2 Church Street, Cardiff.

Wakefield.—Oct. 20.—The West Riding Education Committee invite whole or separate tenders for the following works, viz.:—Great Houghton, new school; Wheatley, Beckett Road provided school—enlargement (builder, joiner, plasterer, slater, plumber, painter). Deposit 1*l.* in each case. West Riding architect, County Hall, Wakefield.

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Wanstead (Essex).—Oct. 15.—For erection of a one-storey school for infants on the Aldersbrook school site, Ingatestone Road. Deposit 2*l*. Mr. Chas. H. Bressey, 70 & 71 Bishopsgate Street Within, London, E.C.

West Malling.—Oct. 12.—For supplying and fixing two revolving consumptive shelters, &c., for the Guardians of Malling Union, at the Workhouse, West Malling, Kent.

The Mansfield Board of Guardians have decided to erect new quarters for the children at a cost of 1,150*l*.

The Tamworth Board of Guardians have agreed to provide a new laundry. The outlay inclusive of the machinery will be 1,841*l*.

The Local Government Board forwarded their sanction to the borrowing by the Birkenhead Town Council of 18,723*l*. for the erection of the Brassey Street Council School, the tender having been secured by Mr. Peter Rothwell, of Birkenhead.

Glasgow Dean of Guild Court last week granted the following linings:—Queen's Park Football Club, to erect pay entrances and exit gates in Somerville Drive; Richard Henderson, architect, 116 Hope Street, to erect six tenements of shops and dwelling-houses in Cathcart Road and Carmunnock Road; Alexandra Park Property Company to erect six tenements of dwelling-houses on the north side of Cumbernauld Road; the Petershill Building Company, 107 Bath Street, to erect a tenement of dwelling-houses on the east side of Bedlay Street, Springburn.

The public baths committee of the Nottingham City Council recommend the erection of swimming and other baths on a site containing 2,200 square yards at the south-west corner of their Meadows Cricket Ground. The city architect has prepared a sketch plan of the proposed baths, and this has been approved of by the committee. It is estimated that the cost of the building and engineer's work will be 9,000*l*. It is proposed that the swimming pond shall be 100 feet by thirty-six feet, that there shall be soap baths and sanitary conveniences, five private baths for ladies, with waiting-rooms, &c., ten private baths for gentlemen, with waiting-rooms, &c., a boiler house, and ticket office and store-room.

TENDERS.

ALPINGTON.

For erecting six cottages, residence and business premises. Mr. J. Archibald Lucas, A.R.I.B.A., architect.

Harvey, Exeter (*accepted*)	£1,549 0 0

BOWBURN.

For erection of a Wesleyan Methodist chapel, &c., at Bowburn Colliery. Mr. J. Wilson Hays, architect, Wingate, Co. Durham.

Draper & Sons	£625 0 0
Oliver	582 13 0
Lazenby	560 0 0
Wall	551 19 7
Wood Bros.	521 0 0
Sanderson & Son	504 17 5
Ponting	494 4 0
Todd & Son	491 1 8
Makepeace & Vallis, Trundon Colliery*	490 17 0
Woods & Adams	456 0 0

* Accepted subject to amendment, £488.

BURNLEY.

For proposed nurses' home and alterations at the infirmary, Rakehead. Messrs. G. & S. Keighley, architects, Burnley.

Recommended for acceptance.

M. & J. W. Heap, mason	£2,525 0 0
Smith & Sons, joiner	1,100 0 0
Shoesmith, plumber	410 0 0
Guest, plasterer	175 14 0
Schofield & Son, slater	139 14 6
Greenwood, painter	107 11 11

CAMBRIDGE.

For erection of additions to the sewage pumping station, Riverside. The Borough Surveyor, Guildhall.

Clark & Sons, Cambridge (*accepted*)	£588 10 0

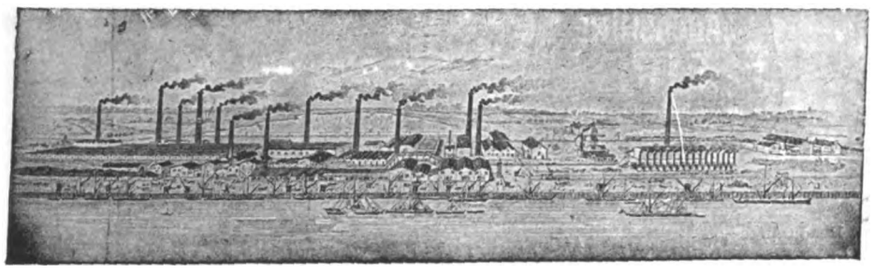
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LEEDS & BRADFORD: E. Oldroyd & Co., Ltd., Crown Works.

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Peerless, Dennis & Co.	2,126 0 0	114 10 0
J. Martin (*accepted*)	2,100 0 0	100 0 0

FRODSHAM.

For skating rink at the "Belle-Monte" pleasure grounds, Overton Hills. Mr. Samuel Davies, M.S.A., architect, Frodsham.

Gleave, Frodsham (*accepted*).

HARTON.

For alterations, &c., to branch of the Boldon Co-operative Society, Ltd. Mr. Charles W. Bell, architect, Sunderland.

Taylor	£596 0 0
Wright	595 5 0
Johnson & Sons, Ltd.	576 15 8
Davidson	571 6 9
Ridley & Crawford	554 7 8
Brown	552 7 0
Knott	547 14 8
Wilkinson	547 0 0
J. & T. Parker, Sunderland (*accepted*)	517 0 0

LONDON.

For the repair and repainting of Holborn Viaduct bridges crossing Farringdon Street and Shoe Lane.

Crook & Son	£1,199 0 0
Mason & Co.	1,080 0 0
Chamberlain	897 8 0
Barker	795 0 0
Stanhouse, Savage & Co.	690 0 0
Nightingale	680 0 0
Blow	650 0 0

LONDON—*continued.*

Vigor & Co.	630 0 0
General Building Co.	615 0 0
MacCarthy	609 0 0
Wood Bros.	595 10 0
Jackson	565 12 6
Peattie & Son	555 0 0
Proctor & Sons	550 0 0
Richards	515 0 0
Stokes & Sons	495 0 0
Beaumont & Sons	487 0 0
Holliday	468 10 0
Kemp	375 10 0
Wollaston & Co. (*accepted*)	333 0 0
Dudley	332 17 5

For the erection of new schools, for the Tottenham education committee.

Stewart, Tottenham (*accepted*)	£20,155 0 0

For plastering work in the "G and H" ward at the Sick Asylum, Devons Road, Bromley-by-Bow, London, E.

Matthews	£380 8 5
Rawley	263 13 6
Hawkings	257 9 6
Wood	252 10 0
Garrett	223 7 10
O'Malley	202 10 0
Rome & Co.	140 0 0
Spencer	138 0 0
Thorn & Co.	133 0 0
Squire	132 0 0
Woollaston & Co.	125 0 0
Torodes	119 0 0
Kingston	105 0 0
Shepherd	98 0 0
Moseley, Queen's Park, N.W. (*accepted*)	78 0 0

NORTHALLERTON.

For sewage disposal works.

Firth & Co., Derby (*accepted*)	£9,433 0 0

Twenty-two tenders received.

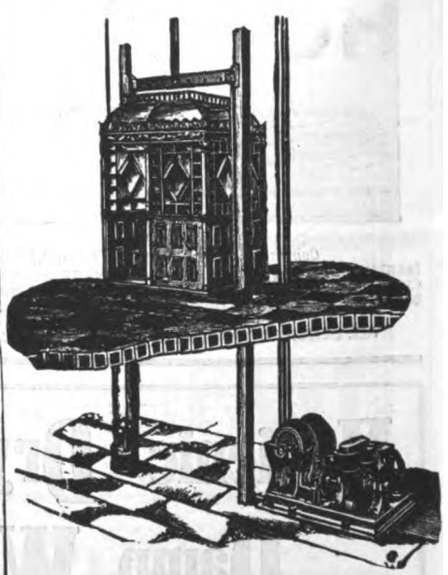
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J. H. Stonehouse, Director.
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PICKLENASH.

For erection of combined cookery and handicraft schools at Picklenash, Glos., for the Newent school managers.

Cousins	£230 0 0
Griffiths	220 0 0
Gurney	203 0 0
Meredith	198 0 0
Bidmead	193 9 7
Peer	193 0 0
Lewis & Co.	188 0 0
Wood & Sons	185 0 0
Cracknall, Gorsley (*accepted*)	168 0 0

PORTLAND.

For Castletown drainage, &c., for the Urban District Council. Mr. R. Stevenson Henshaw, engineer and surveyor, Portland.

Osenton	£1,509 17 4
Barnes	1,442 18 2
Brebner & Co.	1,324 10 4
Jesty & Baker, Portland (*accepted*)	1,319 17 6

STOCKTON-ON-TEES.

For painting, &c., at the workhouse. Mr. John Rodham, surveyor, Stockton-on-Tees.

Pickering	£211 17 6
Wilyman	206 3 6
Croft & Roe	202 15 6
Greenhalgh	194 4 6
Atkinson	163 19 6
Atkin, Stockton-on-Tees (*accepted*)	162 10 4

WALES.

For erection of fourteen brick-built houses at Prendergast, for the Haverfordwest Town Council. Mr. W. Bevan, borough surveyor.

Scott	£3,940 0 0
Williams	2,947 0 0
Rogers	2,702 0 0
Rees & Son	2,600 0 0
Jackson	2,560 0 0
Davies & Son & R. Williams, Haverfordwest (*accepted*)	2,464 0 0
Borough Surveyor's estimate	2,520 0 0

WALES—*continued.*

For the erection of a Congregational chapel school-room at Loughor; also for a dwelling-house on the site adjoining.

School-room.

Jenkins	£543 0 0
Lloyd Bros.	497 0 0
Mercer	487 10 0
Thomas & Thomas	478 0 0
Howell & Son	455 0 0
Davies, Swansea (*accepted*)	367 0 0

Villa.

Lloyd Bros.	814 0 0
Howell & Son	752 0 0
Jenkins	675 0 0
Mercer	670 0 0
Thomas & Thomas	598 10 0
Davies (*accepted*)	557 0 0

For extensions and alterations to the Cymmer Colliery Workmen's Library, Porth. Mr. Edwin Jones, F.I.A.S., architect, Porth, Glam.

Davies & Sons	£1,293 0 0
Richards	1,290 0 0
Isaccas	1,250 0 0
Blundell & Bevan	1,219 0 0
Hallett	1,130 0 0
Jenkins & Son	1,098 0 0
Evans Bros., Cathays (*accepted*)	1,049 0 0
E. D. W. Evans	999 0 0
Architect's estimate	1,235 5 2

Steelwork and fireproof floors.

Howard & Co., London (*accepted*)	284 13 0

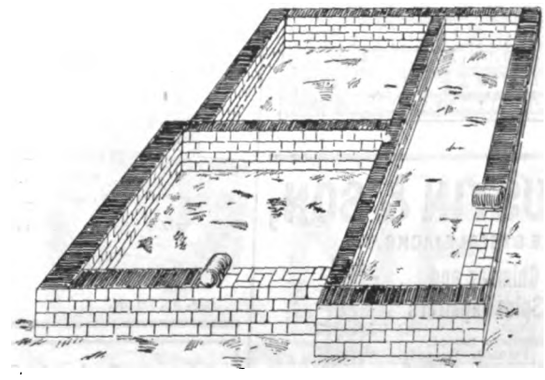
The Plumbers Company, of which the Lord Mayor (Sir John Knill, Bart.) is Master for the third time, at their quarterly meeting appointed a committee to examine the note-books and drawings of the plumber apprentices attending the technical classes, whose names appear on the company's register of indentured apprentices. The committee were instructed to report to the court with a view to awards being made upon the report of teachers as to the attendance of the apprentices and their progress in practical workmanship.

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BUILDING AND BUILDERS.

The Church Council connected with St. Mary's, Barnsley, have decided to build a new boys' school at a cost of 4,000*l.*

The Blantyre School Board, N.B., last week agreed that an elementary school to accommodate 500 pupils and an intermediate school of eight class-rooms to accommodate 320 pupils, together with a janitor's house, be built on the same site. The cost of the elementary school, it was agreed, was not to exceed 10*l.* per pupil, and the intermediate school (exclusive of janitor's house) not to be more than 5,000*l.* A site will have to be purchased.

Arrangements have been completed for the erection of a new skating rink at Burton-on-Trent. The outside dimensions will be 150 feet by 82 feet, and the rink itself will be 140 feet long and 60 feet broad, giving an area of 8,400 square feet. It will be oval in shape, and clear of all supports. In Bath another skating rink is to be opened in the convenient site of James's Street, situate on the Midland Railway's land. It will be equipped with rock maple floor of 22,000 square feet, laid with two thicknesses, with a layer of felt to reduce to a minimum the noise and vibration. Ground has been leased by Mr. James Watson, builder, Uddingston, N.B., to a London syndicate for the erection of a large roller skating rink, with ante-rooms and orchestra platform. The site is practically in the centre of Kyle Park villa district.

Mr. A. A. Hudson, Board of Trade arbitrator, who sat at Swansea as umpire in a dispute between the master builders and plasterers, and which caused a strike of twenty weeks, gave his award last week. The men, who were paid 8½*d.* per hour, claimed an advance of 1*d.* per hour and an alteration of working conditions. The award provides that from April 1 to the end of September the men are to work fifty-four hours per week, from the first to the last day of October and the first to the last day of March fifty-one hours a week, November and February forty-eight hours, December and January forty-two and a half. Under the old arrangement men worked fifty-two hours a week all the year round, and the award reduces the number to 51 5-12 hours per week. Wages are increased ¼*d.* per hour, or about 1*s.* 1*d.* per week.

A manifesto has been issued by the North London building trade strongly protesting against the Land Clauses of the Finance Bill. The document reads:—"We have already suffered considerably by the proposed measure. Since May last to the present date our sales of houses are much less than for the same period last year. Not one of us has made any purchases of land, nor can we do so if the Government insist on taxing us twice over for our raw material—*i.e.*, land—and, what is worse still, seeking to take 20 per cent. of our profits (where we have the good fortune to make any), and taking no account of our losses or depreciation in value of our stock account, land and houses in hand. No business man could work under such conditions, especially since the Chancellor of the Exchequer has declined to allow interest on capital before assessing the increment duty."

The Glasgow Dean of Guild Court have published a report showing that during the year ending August 31 last 368 linings were granted by the court, representing property to the value of 902,613*l.*, while the total valuation of the subjects dealt with during the previous year was 894,716*l.* The increase in the valuation of the work passed by the court during the year is accounted for by the number of public buildings for which linings were granted. So far as these were concerned the total valuation of the new work amounted to 157,522*l.*, and of the additions and alterations to 26,485*l.* In the previous year the valuation of the work passed in this class was only 59,875*l.* The total number of linings granted for all classes of building property was 187 for new work and 182 for additions and alterations, the valuation of the former being 792,402*l.*, and the latter 110,211*l.* The valuations of the tenement properties in the various districts were 335,970*l.* for new work and 10,422*l.* for additions and alterations made up as follows:—Central, new work, 2,000*l.*; additions and alterations, 1,275*l.* Western, new work, 10,530*l.*; additions and alterations, 1,323*l.* Eastern, new work, 44,714*l.*; additions and alterations, 692*l.* Southern, new work, 6,690*l.*; additions and alterations, 1,032*l.* Northern, new work, 11,600*l.*; additions and alterations, 191*l.* St. Rollox, new work, 41,579*l.*; additions and alterations, 1,787*l.* Queen's Park, new work, 106,062*l.*; additions and alterations, 1,952*l.* Maryhill, new work, 112,795*l.*; additions and alterations, 2,170*l.*

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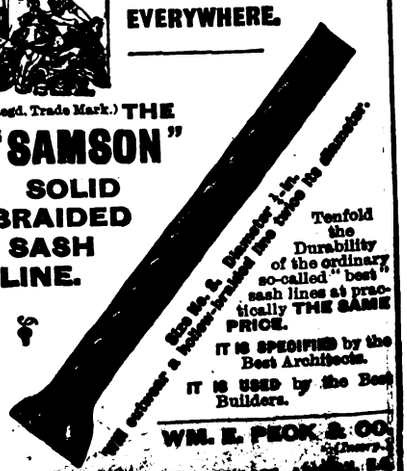
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VARIETIES.

The Guildford Board of Guardians have resolved to borrow 3,075*l.* for the erection of a receiving home for children.

The Chesterfield Rural District Council are to apply to the Local Government Board for a loan of 20,000*l.* for an improved water supply to the villages in their southern district.

The Scarborough entertainments committee have adopted a scheme for the erection of a pavilion in the Alexandra Gardens on the North Cliff, at a cost of 2,500*l.* The Town Council's approval is required.

Mr. Walter Emden is to be presented with the freedom of the borough of Dover in recognition of his services and of the fact that he has been elected Mayor for the third year in succession.

The Bridlington Town Council at their last monthly meeting unanimously decided to spend 3,000*l.* on extensions at the electricity works, and by a large majority decided not to undertake a municipal housing scheme at the Old Town.

The sanitary committee of the West Bromwich Town Council report that the Local Government Board have sanctioned the borrowing of 11,000*l.* for the destructor and the use of the land at the electricity works for the site.

Newcastle-on-Tyne town improvement committee, on Wednesday passed plans for the new entertainment hall and roller skating rink in Northumberland Road, Newcastle, and for a picture hall in Long Row, Byker.

The Irvine Dean of Guild Court have just passed linings of a new post office for Irvine to be erected by Mr. Gavin Ferguson at 157 High Street, Irvine, on the site of the present Montgomerie Estate Office, at a cost of 1,500*l.*

The Mersey Docks and Harbour Board have adopted the recommendation of the works committee to provide, in lieu of the refuse destructor recently authorised to be erected in Lightbody Street, a destructor of greater capacity at an estimated additional cost of 7,700*l.*

The Herne Bay Urban District Council have purchased the pier for 6,000*l.* It is proposed to improve and widen the shore end, to erect a concert pavilion for 2,000 people, and a landing stage for the largest passenger boats. The Local Government Board have granted a loan of 26,000*l.* for the work.

Mr. Harry W. Taylor, A.M.I.C.E. (Messrs. Taylor, Wallin & Taylor, of Newcastle and Birmingham), has been appointed by the Kelso Town Council to report upon the proposal to obtain a water supply by gravitation from the Cheviot Hills. The existing supply to the town from the Tweed has become polluted.

The Clyde Trustees, at a meeting in Glasgow on Tuesday, agreed to a scheme for utilising the new quayage at Meadowside for the discharge of grain cargoes. The scheme involves the erection of a large goods shed and a granary, and the provision of elevators and all necessary appliances, operated by electricity, for the speedy unloading of vessels. The cost will be over 100,000*l.*

Messrs. William Whiteley, Ltd., have declined to pay to the Paddington borough council 82,000*l.* (the minimum price fixed by the Local Government Board) for the Queen's Road baths and freehold site, as they consider this sum to be "greatly in excess of the actual value of the property." It had been provisionally agreed that they would pay 60,000*l.* The bath committee now recommend inviting tenders for the property. It is intended with the proceeds to erect new baths and washhouses.

The Edinburgh Town Council have inspected three projects prepared by the burgh engineer for the heightening of the parapet at the Dean Bridge with a view to the prevention of suicides. They are as follows:—To make an entirely new parapet and coping of an equal height, 4 feet 6 inches; to hew the present base level, and superimpose upon the parapet blocks of similar shape to the first proposal; or to erect a parapet with ornamental buttress spaces.

Dublin has temporarily returned to the not far distant past when the Liffey was a cesspool giving off poisonous vapours. By the new main drainage works, which were opened in 1906, after an outlay of over half a million sterling, the sewage passes from the city by gravitation to Pigeon House Road, where it is pumped to the precipitation tanks of the fort. But recently the eight-foot main drainage sewer became choked by the accumulated deposits from the old city sewers, and it was ascertained that about 5,000 tons of matter had become embedded. As a consequence the



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crude sewage was forced into the Liffey. It is expected that the necessary cleaning-out will not be finished for three or four months.

The executive committee of the Garden Cities and Town-planning Association (an entirely non-party organisation) after considering carefully the effect of the amendments made in the House of Lords to the Housing, Town-planning &c., Bill, has unanimously passed the following resolution:—"That this Association hopes that every effort will be made to carry the town-planning part of the Housing, Town-planning, &c., Bill into law during the present Session of Parliament, and hopes that some agreement may be arrived at between the Government and the House of Lords whereby delay and expensive or cumbrous procedure in regard to town-planning schemes may be as far as possible avoided."

The Blue Book issued on Wednesday, commences a new series of workmen's compensation statistics, as 1908 was the first complete year during which the extending Act of 1906 was in operation. The gross total of compensation paid under the Act was 2,080,672*l*., and represented 3,473 cases of death and 325,484 cases of disablement. The figures do not include payments made in cases outstanding under earlier Acts, &c. In quarries the amount of compensation paid in respect of the accident cases was in respect of the 88 fatal cases 11,501*l*., an average of 131*l*. per case; in respect of the 5,284 disablement cases 23,056*l*., an average of 4*l*. 7*s*. a case. The returns relating to constructional work, such as the construction of railways, tramways, bridges, harbours, docks, &c., show 119 fatal cases, with compensation 13,551*l*., and 6,805 disablement cases with compensation 38,269*l*. In addition 108*l*. was paid for industrial disease, a total of 51,928*l*. for the year.

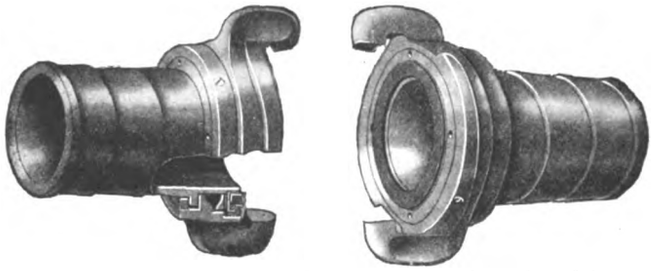
At a meeting of the Cardiff Museum Committee on Friday Mr. J. Ward, the curator, reported upon the recent excavations at Gelligaer, and said that four examples of Roman baths had been discovered, plans of which were submitted. Good examples of architectural work had also been found. The most important find, however, was the part of a large stone inscription referring to the Emperor Trajan when he was consul for the fifth time. This would be, perhaps, about 110 A.D., and gave them the first clue as to the age of the fort. In the course of further business a member asked if anything more had been heard of Mr. Edwin Seward's claim against the Museum Committee. The chairman replied that a sum of 1,100*l*. was tendered to Mr. Seward in bank notes, but he declined to accept them, so the bank notes were returned to the city treasurer.

The autumn season at the Leicester Galleries, Leicester Square, will open on the 16th inst. with an exhibition of paintings, drawings and etchings by Mr. William Strang, A.R.A., LL.D. The collection will include the portrait in oils of the late George Meredith painted by Mr. Strang last year, which has not been previously exhibited. There will also be shown a series of water-colours illustrating "Rubáiyát of Omar Khayyám" by Mr. Edmund Dulac, a young Anglo-French artist. In addition Goldsmith's "The Deserted Village" is the subject of a series of water-colours by Mr. W. Lee Hankey.

TRADE NOTES.

The Sussex Portland Cement Company, Ltd., have issued a calendar for the twelve months commencing October 1909. The excellent sketch which accompanies it is of Hever Castle, Kent, with its moat. This building was recently restored under Mr. Frank Pearson, A.R.I.B.A., who employed over 4,000 tons of their "Newhaven" brand of cement on the work.

The Nunan and Stove Hose Coupling, which has been adopted by such navies as the British, Japanese and Russian, as well as by the P. & O., White Star, Cunard and



other steamship companies, has now been adapted and improved by Mr. A. E. Stove for the purpose of domestic use. In its new sphere it should prove of invaluable service. By

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ILLUSTRATIONS.

NORWICH UNION CHAMBERS, PICCADILLY, W.—GENERAL VIEW—DETAIL OF DOORWAY.

ROYAL INSURANCE BUILDING, PICCADILLY, W.

WINSFORD AND EAST DENE, MURRAY ROAD, WIMBLEDON.

OXFORD COLLEGE SERIES, BRASENOSE.—FRONT QUAD—BACK QUAD.

this improvement the two sleeves of the old coupling are reduced to one, which revolves by a turn of the wrist and firmly grips the fixed end. The male or female joints, which were apt to become bent and consequently not watertight, are obviated; there are no threads to wear out, and it can be used both for suction and delivery, unlike its predecessor, which was unsuitable for suction. All twists in the hose are instantly removed when the water passes through. The greater the pressure at the coupling joint the greater the water-tightness. The contact is made by a pair of lips which fit securely over a flange. If necessary, the hose can be riveted to the sleeve, which was impossible with the two-sleeve coupling. The coupling can be taken to pieces immediately, and any damaged part replaced. The improvement has been subjected to the most severe tests and has won unqualified approval. The sole manufacturers are Nunan's Hose Couplings, Ltd., 10 Norfolk Street, Strand, W.C.

THE JOHN MORLEY LABORATORIES, UNIVERSITY OF MANCHESTER.

The John Morley Laboratories, opened on Monday last by Sir Henry Roscoe in the presence of Lord Morley, the Chancellor of the University, stand at the south-west angle of the central University site. The main buildings of the original Owens College divide the University group into two large quadrangles. Of these the eastern is that which is separated from Oxford Street by the Whitworth Hall and the museums, the western quadrangle being bounded on the west by the medical school, on the north by Coupland Street and on the south by the group of chemical laboratories. The new buildings form a completion of the south-west corner of this western court as they touch the medical school buildings, being built up against their southern wall, and are in turn connected with the older chemical group, being contiguous to the Schorlemmer laboratory and to the laboratory of the late Dr. Schunck, which was a few years ago bodily removed from its original site at Dr. Schunck's residence. The Morley laboratories besides closing in the large western quadrangle, also form on their southern side a smaller court which will now be entirely surrounded by rooms for chemical purposes. The old gymnasium (now removed) formerly stood on a portion of this ground.

The architect, Mr. Paul Waterhouse, has kept the design of the buildings facing the small court studiously plain, aiming at the maximum of light for the laboratories, with a minimum of expenditure on ornament. On the elevations which face the large quadrangle he has endeavoured to produce a result in harmony with the adjoining designs of his late father, Mr. Alfred Waterhouse, R.A., and though no space or material has been wasted in mere efforts towards effect the octagonal stair turret with its cusped windows and the large gable set anglewise to the main building are specially studied as being intended to form harmonious features in the general group of buildings. On this side the walls are faced with buff bricks, and the window dressings, copings, strings, and other stone work are of Stanton Woodhouse stone. In the inner court ordinary local bricks are used for the facing and the stonework is reduced in quantity.

The principal room in the new block is the large laboratory for organic chemistry. It is 64 feet long, 32 feet wide and 28 feet high. The open timber work of the roof is all of pitch pine, and the use of plaster (as being readily destroyed in the atmosphere of such a laboratory) has been entirely avoided. The windows are as large as possible, there are abundant skylights, and in this room as in all the others, special attention has been given to the extraction both of general air for ventilation, and of fumes from the fume closets with which the walls are lined on both sides. There is also an elaborate system of floor channels for the disposal of sink-drainage. The walls of this laboratory are faced with glazed bricks from floor to ceiling.

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The basement below this large room and the whole of the block which connects it with the Schunck laboratory, are almost entirely given up to well-lighted research rooms, the only exceptions being that one room is set aside as a writing room, and that others are devoted to the necessary sanitary accommodation, stores, &c.

That portion of the ground floor which faces north and east is devoted mainly to a large "service room" which is in effect a store room for materials. Adjoining this service room is the corridor leading from the older chemical block, so that the service room is at a point conveniently accessible from the whole of the chemical departments. It is also adjacent to the main new staircase. (There is another minor staircase at the other end of the new laboratories.) Below the service room in a so-called basement, which in reality has large windows practically above ground, forming the important and much-needed extension of the laboratory for "First M.B." students, connecting directly with the older room that has served the same purpose. On the upper floor, above the service room is a group of three private (professors') rooms. One of them is a study, another is a good-sized and well-equipped laboratory, with windows on two sides and a sky-light.

The heating of the whole block is effected from the newly installed general heating plant of the university. The ventilation is independent, being actuated by special fans.

As far as possible the use of plaster and of exposed iron work has been avoided in all laboratories, though occasional use has been made of cement. Wall surfaces are for the most part of glazed or "Premier" bricks.

Messrs. G. Macfarlane & Son are contractors, and the whole work has been superintended by Mr. L. Knowles.

The "Premier" facing bricks came from the Aston Hall Brick Company. The glazed bricks from the South Buckley Brick Company, the constructional steelwork was in the hands of Edward Wood & Co., and the wrought iron balustrades, &c., were made by Hart, Son, Peard & Co., of London and Birmingham. The Crittall Manufacturing Company were responsible for the metal casements and frames.

The presentation key, modelled and engraved in silver, which Mr. Waterhouse, as architect, handed to Sir Henry Roscoe, was made by the Birmingham Guild of Handicraft.

INSTITUTION OF MUNICIPAL ENGINEERS.

Arrangements have been made with the Associated Portland Cement Manufacturers (1900), Ltd., for the members of the Institution of Municipal Engineers to visit the company's works at Northfleet on the 16th inst. The train leaves Cannon Street Station (S.E. & Chatham Railway), 11.42 a.m., London Bridge Station at 11.45, and arrives at Northfleet Station at 12.47, whence the party will walk to the adjacent factory hall—the property of, and adjoining one of the works of, the Associated Portland Cement Manufacturers (1900), Ltd., where luncheon will be served. At 2 p.m. special tram-cars will leave the hall for Swanscombe works, where the party will be divided into sections, each under the guidance of one of the company's officials, who will conduct them and explain the various processes:—(1) The quarrying of the chalk on the properties of the company adjoining the works and the method of amalgamating the chalk and clay in the powerful wash mills and screening mills. The power-house operating this section of the plant is driven by three Oechelhauser gas-engines, each of 400-h.p., which with four more engines of this type, driving grinding mills, have recently been installed at the works; (2) the slurry mixing and storage tanks, the largest having a capacity of 7,000 tons. These contain the mixture as pumped from the wash mills and before being delivered to the rotary kiln plant; (3) the rotary plant, which is the largest in Europe, having a capacity of 7,000 tons of Portland cement per week and consisting of sixteen kilns, each 130 feet in length. The two main steam-engines and generators of 1,000-h.p. capacity each, which provide the power for driving this and other sections of the works, will be seen in the engine-houses underneath the kiln floor; (4) grinding mills. The product from the rotary kilns after passing through the cooling cylinders is conveyed by means of transfer cars and an electric lift to the various grinding mills, where the clinker is reduced to a fine powder in preliminary ball mills and in tube mills for the final grinding. During the latter process the setting time of the cement is regulated to any required degree by means of the hydrating apparatus, which will be shown and explained; (5) the cask making department, capable of turning out over one million casks per annum. The

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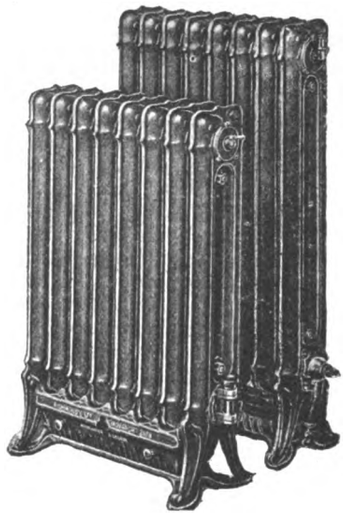
party will then proceed by a special train of improvised cars over the works railway to the new reinforced concrete jetty which has recently been completed on the banks of the Thames about a mile from the factory. After inspecting the warehouses, the Mason gas-producer plant and the works testing-room, where the setting time, fineness and other characteristics of the cement coming from the various grinding mills are continually being checked, the party will rejoin the tram cars, a comprehensive bird's-eye view of the works and surrounding country being obtained when walking up the hill. At 4.30 p.m. cars will leave Galley Hill, Swanscombe, for the factory hall, where tea will be provided, at the conclusion of which there will be a demonstration of the gauging and testing of Portland cement, including determinations of setting time, soundness, fineness, gauging of briquettes for tensile strength and testing of specimens. There will also be an exhibition of scientific and other special apparatus for the examination of Portland cement. The return will be made at 6.12.

The Monmouthshire County Council are considering a report by Mr. Baldwin Latham concerning the water supply of the western portion of the county. The creation of a joint water board is recommended. Mr. Latham advocates the construction of a single reservoir of 315,000,000 gallons capacity in the Grwyne Valley, Breconshire, at a height of 1,650 feet. The cost of this scheme would be about 250,000*l.*

A special meeting of the Tonbridge Urban Council considered last week the report of the committee on the sewage disposal. They recommended that centrifugal pumps be obtained for pumping upon low land, and ram pumps for the high land; that the pumps be operated by suction gas, and that the present town gas be utilised for starting the engines and for storm-water pumping. The committee further recommended that application be made to the Local Government Board for sanction to borrow 8,500*l.*, made up as follows:—Alteration to existing buildings, to enable the new pumping plant, engine beds, &c., to be put therein, 6,499*l.* 12*s.* 8*d.*; pumping plant, 1,845*l.*; contingencies, 155*l.* Some discussion ensued, and ultimately it was agreed that electrical power should be used.

GAS-STEAM RADIATORS.

On the unimpeachable authority of a Royal Commission it is calculated that the unworked coal supply of Great Britain is sufficient, after allowing for an average increase, to last for 500 years more. That estimate is a conservative one, for there is every reason to assume that the consumption of coal will decrease in proportion as its use increases. A millionaire mustard-maker once explained that his fortune was made not by what was eaten, but by what was left on the plates. So likewise the collieries have been kept busy in supplying the coal that was wasted by millions of fire grates, furnaces and boilers. Now science has been brought to bear on the subject and has begun to devise means of getting more and more value out of coal. Gas stoves and fires have for a good many years been irresistibly advancing in popular favour. A later development is here illustrated; it is a Richmond's "Monarch" gas-steam radiator.



As will be seen, it resembles the usual double-loop steam or hot-water radiator. At the foot is a gas burner running

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along the base. Above it is a small boiler filled with a small quantity of water by hand. In a short time after the gas is lighted the water gives off steam which rises through the loops and radiates heat. The supply of gas burning is automatically controlled by the steam pressure on the regulating valve; as the pressure of steam rises the gas is reduced. The burner is fitted with Richmond's "Gas and Air" Adjuster, which ensures perfect combustion, and the gauge-glass indicates the quantity of water in the boiler. Another automatic valve allows the cold air to escape when driven up by the steam. The radiators are especially made to permit a free circulation of air around the loops. The "Monarch" steam radiator has been installed in Kensington Palace, the War Office, Victoria and Albert Museum and many other Government buildings, as well as important theatres, schools, churches and other places, where it has always proved a great success.

LECTURES AT THE BRITISH MUSEUM.

Mr. Banister Fletcher, F.R.I.B.A., gave the introductory lecture of a course of twenty-four University Extension lectures on "Ancient Architecture," at the British Museum on Tuesday afternoon. He first dealt with the nature of the lectures to be given during the coming winter, saying that he would trace the evolution of Ancient Architecture in Egypt, Assyria, Greece, Rome and Byzantium on broad lines from a popular point of view. Architecture was the visible exponent of civilisation embracing the other arts, and all designs at the present day were founded upon old art suited to modern needs. The study of architecture was thus necessary to architects, craftsmen and art students, and further it would be difficult to find anyone to whom a knowledge of it would not be beneficial. The author, journalist, photographer and antiquary required a knowledge of the evolution of the successive periods of architecture in order to enable them to take an intelligent interest in their work. The teaching profession were also endeavouring to make history interesting by referring to the dwellings and temples people constructed to suit their social and political requirements.

A knowledge of architectural history also added much to the enjoyment and benefit of travel which is so popular in these days of quick and easy transit, for it would enable travellers to take an intelligent interest in the buildings and monuments from which the history of the past could be gleaned. By a study of the most beautiful buildings which had been erected in past ages an improvement in the architecture of our own country would assuredly result. The lectures are to be illustrated by some 1,200 views, the object being to transport students as it were to the actual sites, and so familiarise them with the principal buildings, and during the twenty-four hours so spent they would be enabled to study what would require in actual travel at least as many months.

Mr. Fletcher next gave a short illustrated review of Ancient Architecture in order to show the various types of buildings erected during the period.

This course of lectures is the first illustrated by lantern slides given in the British Museum, and should be of special value to the student, as he stands in the midst of the world's richest collection of ancient fragments of art, of which the lectures form an excellent explanation. Indeed, it should make the Museum much more useful and enhance its value to the public which justifies its existence. The trustees are therefore to be heartily congratulated on this new departure.

The lectures are given on Tuesday afternoons at 4.30 in the Assyrian Saloon. The subject of the next lecture will be "Egyptian Architecture," and all particulars can be obtained from Miss Gaudet, Hon. Secretary of the Course, 120 Cheyne Walk, Chelsea, S.W.

At the last meeting of the Council of the Institution of Municipal Engineers, twelve applications for membership and seven for studentship were considered. Of the former nine were accepted, of the latter six. The roll of the Institution now stands at 612 members and eighty-two students, making a total of 694. A design for students' certificates was approved, and the secretary was instructed to put the matter in hand. It was decided that three Council meetings during the present financial year should be held on a Saturday at two o'clock. Notice of the following motion was given:—That the existing classification of members be reconsidered on a wider basis.

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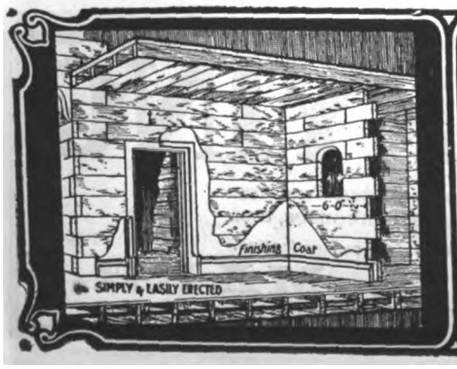
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THE STATUS OF THE ENGINEERING PROFESSION.

Mr. G. Allan Thomas, the winner of the "Status" prize, awarded by the Society of Engineers for the best essay on "How to Improve the Status of Engineers," read his paper on Monday at a gathering of members of the Society at the Caxton Hall. Mr. Edward John Silcock, the president, was in the chair.

In depicting the difficulties which the professional engineer has to contend with, the author remarked that although the science of engineering enters very largely into modern civilisation, the position of engineers at the present day is far from satisfactory, and will not improve until definite steps are taken to secure for them that recognition which is accorded to members of other professions. The term "engineer" is too loosely applied, and is often used by those who have no proper claim to be so described. Every branch of the profession, civil, mechanical and electrical, is equally concerned, and they should unite to overcome the obstacles by which they are handicapped; some of these difficulties being stated as follows:—

Overcrowding of the Profession.—This is due to the constant influx of men lacking sufficient scientific training, who have no great love for their work, but are apparently tempted by the ease with which a footing may be gained.

Misuse of the term Engineer.—This word is seen tacked on to almost every industry, and unfortunately it has gone on for so long that the only remedy will be to find a new word with which to designate members of the profession, unless means can be devised for restraining the use of the old title by unauthorised persons.

Multiplication of Societies.—The tendency of the present day is all towards an increase in the number of engineering societies, but although such associations do good work, it is a mistaken policy to allow members to use the initials of societies other than the three principal institutions as a distinguishing mark.

Advertisement.—Engineering businesses cannot refrain from advertising, but no professional man should be allowed to do so, whether he be a consulting engineer or the manager of a business concern.

General.—In the absence of any legal status, it is difficult to establish a scale of fees, and so to prevent cutting of prices. Consultants are also unfairly hampered by manufacturers, who give advice, naturally biassed, on engineering matters, and prepare estimates and drawings free of charge, in order to secure work for the firms with which they are connected.

Having sketched the chief hindrances to the advancement of the profession, the author proceeded to outline a scheme for their removal. In the first place, he advocates the election of a "Central Organising Body" from members of the three most important institutions, those of the Civil, Mechanical and Electrical Engineers respectively. Such a body should be equally representative of each institution, and for this purpose each should be placed on the same footing, since as far as the scientific training of their members is concerned there is no material difference. The "Central Body," when complete, should endeavour to obtain recognition as a legalised corporation by Act of Parliament, and should have supreme organising and judicial powers in all matters relating to the profession. They should also have power to appoint committees to deal with special subjects. The points to which they should first apply their energies should be (1) Registration; (2) Education; (3) Minimum fees; (4) Organising funds to aid invention and research. An effort should then be made to formulate schemes for the establishment of an information bureau for engineers, and the institution of a benevolent fund.

In conclusion, he remarked that every effort should be made to arouse interest in this important question of reform, because delay will only tend to make the problem more complex.

Messrs. Charles Brand & Son, 188 West Regent Street, Glasgow, have been awarded the contract for the construction of the Imperial Dock, Leith. The work is to include excavation, masonry, timber and cement work. Messrs. Brand were the contractors for the construction of the dock at Grangemouth, completed eighteen months ago, and recently constructed the dock and pier works at Kirkcaldy. The work is expected to cost about 100,000*l*.

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SHORT WEIGHT PAINTERS' BRUSHES.

At the Birmingham Police Court Mr. A. C. Leng, trading as C. H. Leng & Son, brush manufacturers, Reliance Works, Sherbourne Road, Balsall Heath, Birmingham, was recently summoned at the instance of Thomas Marson Till, 8 Old Jewry, London, secretary of the British Brush Manufacturers' Association, for selling brushes to which a certain false description was applied, the brushes being marked "9 ozs.," but in fact contained a smaller weight of bristles. The charge was admitted.

Mr. Joy, who appeared for the prosecution, said it was taken out under the provisions of Section 2, paragraph D of the Merchandise Marks Act, for applying false trade descriptions to certain goods. It had been instituted by the British Brushmakers' Association to protect not only the public but also the trade from mistakes of the kind that appear to have been made in this case. The particular charge is that seven brushes of this description, which are marked so that everyone can see that they contained nine ounces of bristles —bristles which are of considerable expense—were dissected and taken to the Corporation Department to be weighed with absolute accuracy; instead of weighing nine ounces they weighed a shade over eight ounces. That might seem a trifling matter, but when one-ninth is left out it meant a very considerable amount to that person, to the loss of the purchaser. The regular practice in the trade, for the purpose of safeguard, was to weigh out to the man the full nine ounces of these bristles. So far from there being any loss worth speaking of, except on taking them to pieces, there would be a slight increase, because of the seccotine or cement which they fix them in with. These have been weighed with extreme care, and taking into account the handling of the brushes, the result is they are practically an ounce short. As the defendant pleads guilty, said the prosecution, there was no more to say, except on behalf of the Association undertaking the prosecution. Their object would be achieved if the attention of the trade was brought to the fact that this kind of thing cannot be permitted. The defendant should pay such a sum as costs as would reasonably save the Association from being out of pocket in the matter. The brushes weighed eight grains over the eight ounces, and there are about 437 grains to the ounce.

On behalf of the defendants it was explained they were members of the Association which instituted the prosecution. That they had committed an offence there was no doubt, but it was a technical offence under the Act. It was a custom in the trade, admittedly a bad custom, but nevertheless a custom to mark out eight ounces exactly and manufacture them under weight. Several specimens of brushes made by other manufacturers had been weighed, and all were under weight. The Act says that if a manufacturer puts "nine ounces" on a brush he has to put in nine ounces. It is a common expression in the trade that a nine-ounce brush does not contain nine ounces. The Association wanted to stop it. It was merely a test case, and the first of the kind in this particular trade. As the defendant had done no more than his fellow manufacturers had done, it was submitted the technical offence should be dealt with accordingly. The prosecution were given every possible assistance. The offence was at once admitted. The action was simply to warn the trade that such a thing is not legal and not in the best interests of the trade, and the case would be met by a nominal penalty and as much mercy as possible so far as costs are concerned.

In reply to the prosecution, exception was taken to the assertion this was the proper custom in the trade.

The Chairman of Magistrates said, that as this was the first case of the kind brought before the court, he thought that justice would be met by inflicting a small fine of 1*l.* and three guineas costs.

This was agreed to, and the other summonses were withdrawn.

The Tiverton Town Council, who are threatened with an action on account of the nuisance caused by their sewage works, have under consideration an independent report in which improvements at a cost of 9,000*l.* are advised.

The Willenhall Urban District Council have adopted a scheme, prepared by the surveyor (Mr. T. Edgar Fellows), for new sewage disposal works. It was resolved that the scheme, plans, estimate and specifications be approved, and application made to the Local Government Board for sanction to borrow 12,000*l.* for the carrying out of the works.

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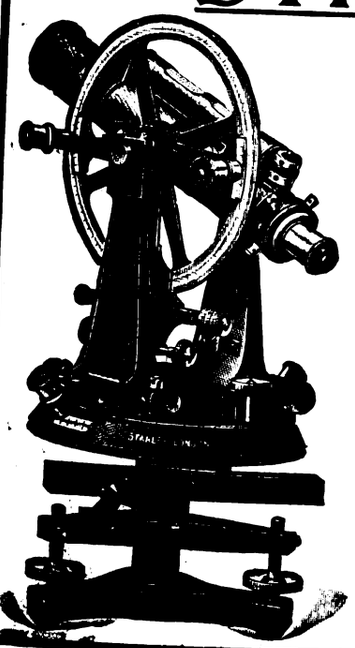
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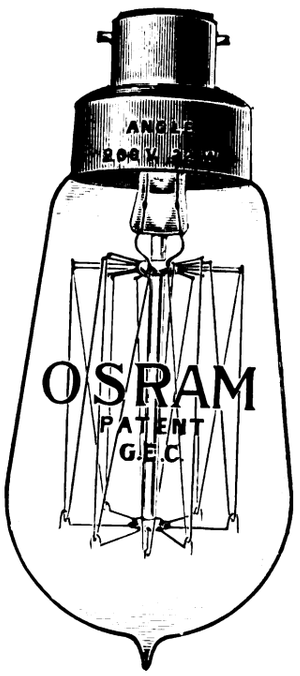
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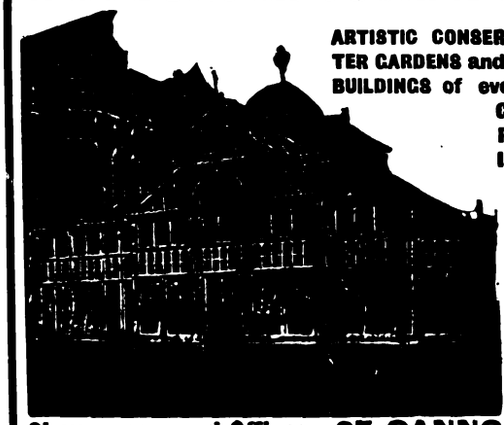
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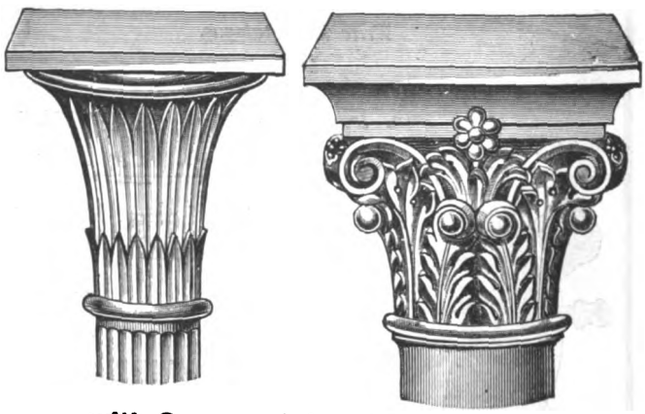
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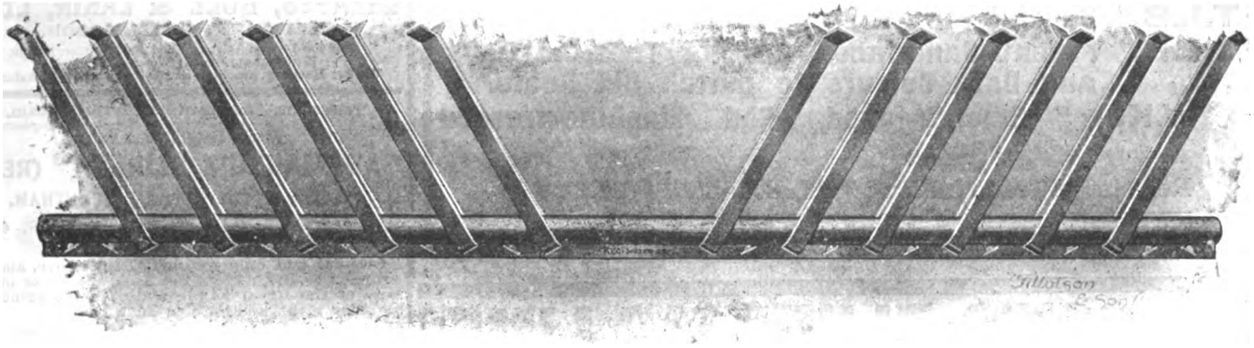
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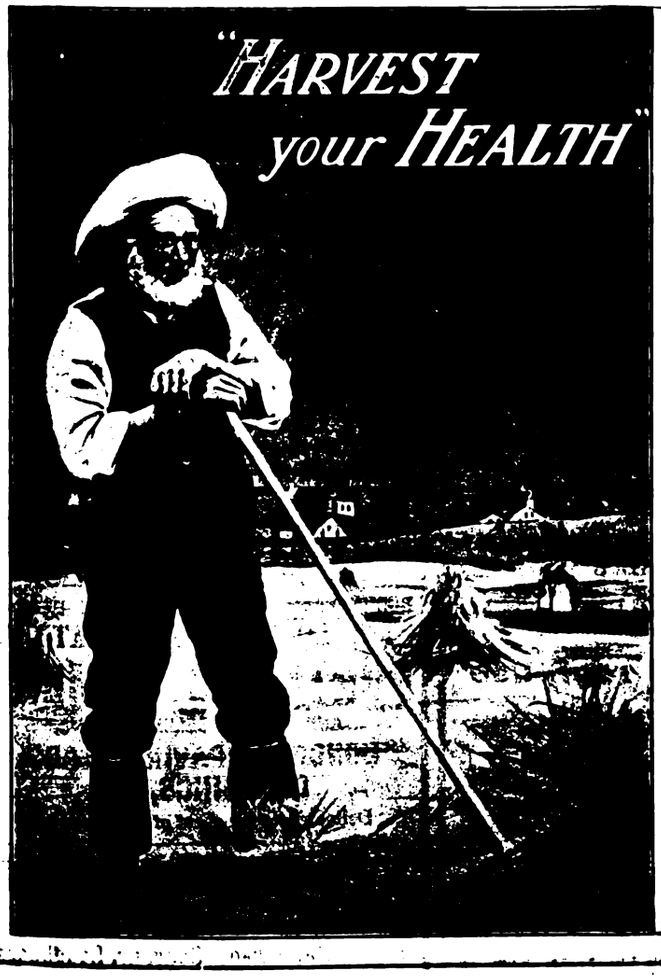


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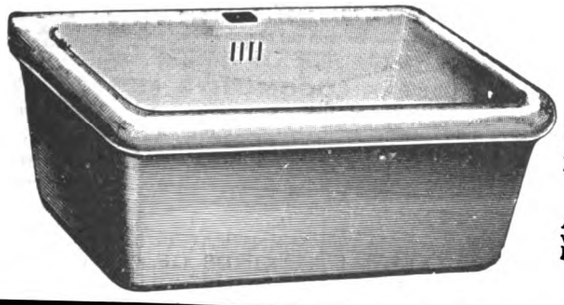
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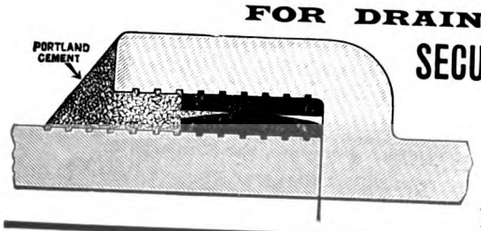
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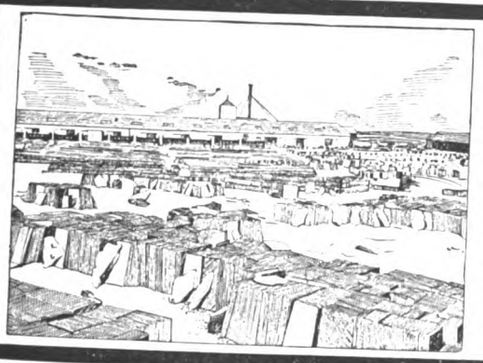


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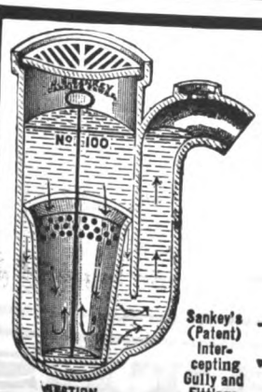
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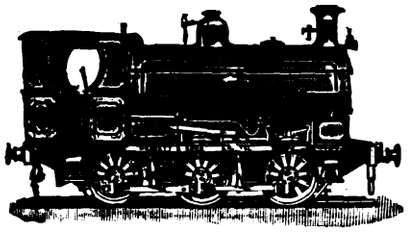
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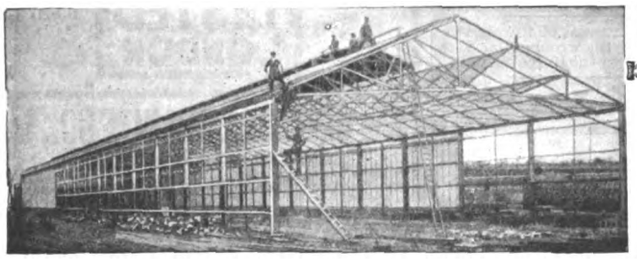


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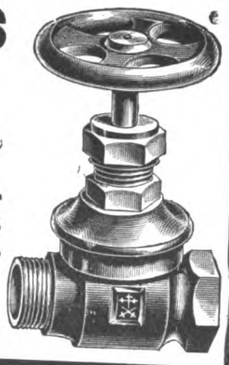
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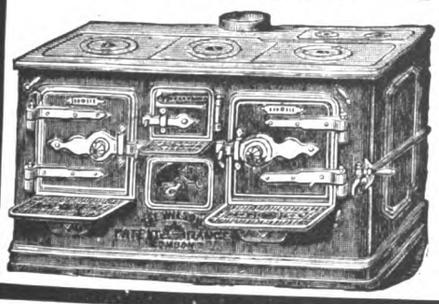
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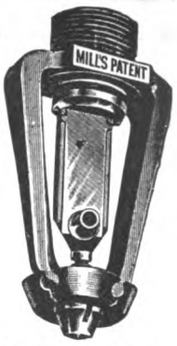
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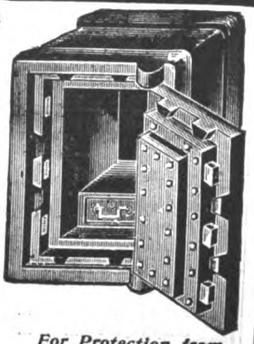
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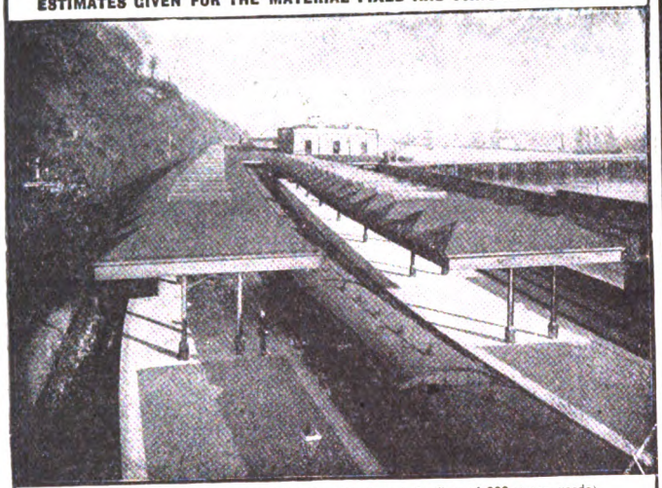
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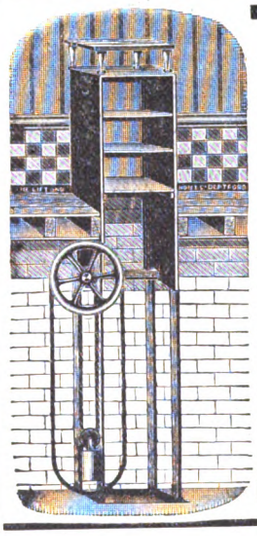
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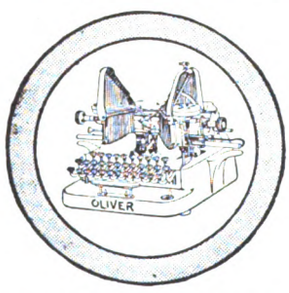
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EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

*** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

HULL.—Oct. 18.—The education committee invite designs for a college for the training of teachers for elementary schools. Premiums of 150*l.*, 100*l.* and 50*l.* Assessor, Mr. John W. Simpson, F.R.I.B.A. Deposit 1*l.* 1*s.* Mr. J. T. Riley, secretary of education, Albion Street, Hull.

KENDAL.—Nov. 1.—The Corporation invite architects residing and practising in Westmorland to submit designs with description and estimate of a technical school. Premiums of 15*l.*, 10*l.*, and 5*l.* are offered.. The Borough Surveyor, Kendal.

LEEDS.—Dec. 18.—The education committee invite architects practising in Leeds to submit designs for proposed training college for teachers, Kirkstall Grange, Far Headingley. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist the committee. Deposit 2*l.* 2*s.* Mr. James Graham, Secretary for Education, Education Department, Leeds.

PRESTON.—Nov. 1.—The Corporation invite designs for a boys' grammar school. Premiums of 50*l.*, 30*l.* and 20*l.* Mr. Alfred Howarth, town clerk, Town Hall, Preston.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

WORKINGTON.—Nov. 30.—The Cumberland education committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the borough of Workington, Cumberland, for about 300 pupils of both sexes. Deposit 1*l.* 1*s.* Mr. C. Courtenay Hodgson, secretary, The Courts, Carlisle.

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CONTRACTS OPEN.

Barnsley.—Oct. 18.—For erection of a boys' grammar school in Shaw Lane. Deposit 2*l.* 2*s.* Send names to Mr. G. Alfred Bond, clerk to the Governors, 8 Regent Street, Barnsley.

Bath.—Oct. 26.—For erection of ten or more dwellings for persons of the labouring classes, in Middle Lane, Dolemeads. Deposit 2*l.* 2*s.* The City Surveyor's Office, Guildhall, Bath.

Bodmin.—Oct. 28.—For erection of proposed East Cornwall Hospital in Rhind Street. Mr. Morley B. Collins, architect, Clinton Road, Redruth.

Bournemouth.—Oct. 22.—For erection of new science, art and technical schools, Lansdowne. Deposit 10*l.* 10*s.* The Borough Engineer, Municipal Buildings, Bournemouth.

Bournemouth.—Nov. 5.—The Town Council invite schemes and tenders for the construction of six cells, as additions to their existing destructor. Deposit 5*l.* 5*s.* Mr. F. W. Lacey, M.I.C.E., borough engineer, Municipal Buildings, Bournemouth.

Chitterne.—Oct. 20.—For erection of a house and stables, &c., at Chitterne, Wilts. Mr. W. Cecil Glass, architect, 9 The Bridge, Frome, Somerset.

Crewe.—Oct. 23.—For a new boys' school and additions and alterations to the Bedford Street schools to accommodate about 700 children. Deposit 2*l.* Mr. G. Eaton-Shore, borough surveyor, Municipal Buildings, Earle Street, Crewe.

Darlington.—Oct. 19.—For erection of steam-roller sheds, cart sheds, and alterations to existing office and stores at the Store Yard, Borough Road. Mr. George Winter, borough surveyor.

Durham.—Oct. 19.—The Durham County Council invite sole tenders, as follows:—(1) For erection of Trimdon Grange school (450 scholars), Mr. W. Rushworth, Shire Hall, Durham; (2) For erection of Fatfield school (250 scholars), and extensions at Seaham Harbour Council school (588 scholars). Mr. F. E. Coates, Shire Hall, Durham.

Eastbourne.—Oct. 19.—For alteration and extension of the tipping platform at the refuse destructor works at Roselands. Mr. A. Ernest Prestcott, borough surveyor, Town Hall, Eastbourne.

Farnworth.—Oct. 27.—For erection of a Carnegie library in Market Street. Deposit 5*l.* Mr. Walter J. Lomax, architect, 11 Fold Street, Bolton.

Great Yarmouth.—Oct. 22.—For alterations and additions to the offices at Runham Vauxhall school. The Borough Surveyor, Town Hall.

Ireland.—Oct. 21.—For erection of single labourers' cottages, for the Carrick-on-Shannon No. 2 Rural District Council. Deposit 1*l.* The Board Room,' Union Workhouse, Carrick-on-Shannon.

Ireland.—Oct. 27.—For reconstructing premises in Scotch Street, Armagh. Mr. Sampson Jervois, M.R.I.A.I., architect, Armagh.

Ireland.—Nov. 1.—For the erection of Central Technical Institute, Military Road, Limerick. Deposit 1*l.* Mr. James MacKay, quantity surveyor, 58 Dame Street, Dublin, and 82 South Mall, Cork.

Jersey.—Oct. 20.—For erection of twenty-one married soldiers' quarters, under the reconstruction of St. Peter's Barracks, Jersey, scheme. Deposit 1*l.* 1*s.* The Royal Engineer Office, Rouge Bouillon, St. Helier, Jersey.

London.—Oct. 18.—For erection of a cottage at the refuse destructor, Barrowell Green, N. Mr. C. G. Lawson, surveyor, Council Offices, Palmer's Green, N.

London.—Oct. 22.—For erection of mortuaries and post-mortem room, for the Poplar Borough Council. Deposit 2*l.* 2*s.* Mr. Harley Heckford, A.M.I.C.E., borough surveyor, Council Offices, High Street, Poplar.

London.—Oct. 18.—For renovation of the corridors, cloak rooms, and cookery centre, and for the provision and fixing of cloak room fittings at the Long Lane Council school, East Finchley. Deposit 1*l.* Mr. C. J. Jenkin, Surveyor's Department, Council Offices, Finchley, N.

Merton.—Oct. 22.—For the following works, for the Urban District Council:—(*a*) Erection of a cart shed, &c.; (*b*) road-making and sewering works in Cannon Hill Lane. Mr. G. Jerram, surveyor, Council Offices, Merton, Surrey.

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MIDDLESBROUGH.—Oct. 20.—For the whole of the works required in the erection of the Kirby secondary school. Deposit 2*l.* 2*s.* Send names to Mr. A. Forrester, architect, 141 High Albert Road, Middlesbrough.

MILLBROOK.—Oct. 21.—For works of restoration to be carried out at Millbrook Old Church, Hants. The Rev. G. G. Elton, Millbrook Rectory, Southampton; or Mr. B. D. Cancellor, architect, 12 Jewry Street, Winchester.

MORECAMBE.—Oct. 28.—The Corporation invite designs and tenders from firms specialising in bandstands and shelters for supply and erection of two bandstands and four shelters. Mr. J. W. Hipwood, A.M.I.C.E., borough surveyor, Morecambe.

OLD HILL.—Oct. 25.—For erection of a house for a fire engine and a tower for hose-drying at Halesowen Road. Mr. Daniel Wright, clerk, Council Offices, Old Hill, Staffordshire.

PICKERING.—Oct. 18.—For addition to the Pickering Grammar school, Yorks. Deposit 1*l.* Mr. John Bilson, architect, 23 Parliament Street, Hull.

RADCLIFFE (LANCS.).—Oct. 23.—For the construction, erection, and completion of a footbridge over the river Irwell, from Lomax Street to Cawdaw. Deposit 1*l.* 1*s.* Mr. W. L. Rothwell, engineer to the Council, Council Offices, Radcliffe.

ROCHFORD (ESSEX).—Oct. 18.—For an addition to the infirmary. Mr. Frederic Gregson, clerk to the Guardians of Rochford Union, Southend-on-Sea.

ROTHERHAM.—Oct. 18.—For the Rotherham court-house alterations, &c. Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

ST. ANNE'S-ON-SEA (LANCS.).—Oct. 23.—For erection of eighteen workmen's cottages (in blocks of six) according to tenderer's own design and specification. The cost per cottage, which must be in complete readiness for occupation, must not exceed 130*l.* Mr. Henry Gregson, surveyor, Council Offices, St. Anne's-on-the-Sea.

SCOTLAND.—Oct. 18.—For the mason, joiner, slater, plasterer, glazier and painter works of additions to Friars Carse Mansion House, Dumfries. Messrs. James Barbour & Bowie, architects, 53 Buccleuch Street, Dumfries.

SCOTLAND.—Oct. 18.—For the mason, carpenter, slater, plumber, plaster, painter and iron works of new house, motor garage, enclosing walls and railings, to be erected at Hopeman. Mr. John Wittet, architect, Elgin.

SCOTLAND.—Oct. 23.—For mason, carpenter, slater, plumber, plaster, and painter and glazier works for block of shops and dwelling-houses in High Street, Kingussie. Mr. Alexander Mackenzie, C.E., Kingussie.

SHEFFIELD.—Oct. 21.—For the adaptation of premises, Suffolk Road, for a labour exchange, for the Commissioners of His Majesty's Works and Public Buildings. The Postmaster at Sheffield, or H.M. Office of Works, &c., Storey's Gate, S.W.

SHERBURN HILL.—For erection of five cottages for Sherburn Hill Co-operative Society, Ltd., at Shotton Colliery, Durham. Apply to Mr. L. G. Ekins, architect, Co-operative Wholesale Society, West Blandford Street, Newcastle-on-Tyne.

STOCKPORT.—Oct. 20.—For erection of a boiler house at the Portwood gasworks. Gas Engineer, Portwood.

WAKEFIELD.—Oct. 20.—The West Riding Education Committee invite whole or separate tenders for the following works, viz.:—Great Houghton, new school; Wheatley, Beckett Road provided school—enlargement (builder, joiner, plasterer, slater, plumber, painter). Deposit 1*l.* in each case. West Riding architect, County Hall, Wakefield.

WALES.—Nov. 11.—For erection of twenty-four or more dwelling-houses, together with the construction of roads, sewers, &c., at Aberfan, for the Pleasant View Building Club. Mr. O. P. Bevan, architect and surveyor, Express Chambers, Merthyr Tydfil.

WALES.—Oct. 27.—For the following works, for the Glamorgan County Council, viz.:—(1) Alterations to the master's house at the Council school at Bedlinog; (2) new offices at the Council school at Pontardulais; (3) new offices, &c., at the county school at Bridgend. The County Council Offices.

WALES.—Oct. 29.—For erection of a county hall in the Cathays Park, Cardiff, upon foundations which have already been laid, for the Glamorgan County Council. Deposit 2*l.* 2*s.* Messrs. Harris & Moodie, architects, 8 New

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Square, Lincoln's Inn, London, W.C., or at the County Council Offices, Cardiff.

Wales.—Oct. 25.—For additions and alterations to Cwmbran Police Station and Court, Mon. Deposit 1*l.* 1*s.* Mr. William Tanner, F.S.I., county surveyor, Newport.

Wales.—Oct. 16.—For alterations and additions to Gowerton Police Station, Glamorgan. The County Council Offices, Cardiff.

Wales.—Oct. 16.—For erection and completion of a hall at St. Dogmaels, Cardigan. Mr. J. Teifion Williams, architect, Napier Street, Cardigan.

Wales.—Oct. 16.—For the conversion of three cottages into shops at Troedyrhiw. Mr. William Dowdeswell, architect, Treharris.

Wendron.—Oct. 18.—For erection of a cottage at Pollard in Wendron, Cornwall. Mr. Arthur Pearse Jenkin, Trewirgie, Redruth.

Westwell.—Oct. 20.—For repointing the brickwork of the workhouse chimneys, for the Guardians of West Ashford Union. The Master of the Workhouse, Westwell, near Ashford, Kent.

Whitehaven.—Oct. 19.—For erection and completion of a shelter and tool-house, &c., in the new portion of the cemetery. Mr. Ernest E. Stiven, Town Hall, Whitehaven.

Yorks.—Oct. 22.—The West Riding education committee invite whole or separate tenders for the following works:—Castleford: Welbeck Street provided school, alterations; Mytholmroyd: Burnley Road provided school, alterations (builder, joiner, slater, plumber, plasterer, painter), Deposit 1*l.* each. The West Riding Architect, County Hall, Wakefield.

The corporate property committee of Scarborough, which consists of all the members of the Corporation, recommend that the entertainments sub-committee should be empowered to obtain tenders for the erection of a floral hall in the Alexandra Gardens, the estimated cost of which is about 3,000*l.*, including the lavatories. The floral hall is to be of glass on iron columns, 12 feet high, with an opening towards the sea, and will occupy about half the space of the oval, seating from 1,200 to 1,500 people.

TENDERS.

ARMTHORPE (DONCASTER).

For extension of Armthorpe National schools. Mr. John Simmons, architect, Doncaster.

Anelay	£679 0 0
Sprakes & Sons	677 10 0
Wortley	666 14 0
Mullins & Richardson	622 11 0
Gill & Son, Doncaster (*accepted*)	617 0 0

COLCHESTER.

For erection of technical institute. Mr. H. A. Cheers, architect, Twickenham, London.

Chambers	£12,965 0 0
Beaumont	12,919 0 0
Saunders	12,720 0 0
Pattinson & Sons	12,450 0 0
Everett & Son	12,335 0 0
Patrick	12,296 0 0
Ward	12,049 0 0
Bennett	11,960 0 0
Fryer	11,929 0 0
Dobson & Sons	11,790 0 0
Jones	11,600 0 0
Lawrence & Son	11,522 0 0
Kenny	11,410 0 0
Spencer, Santo & Co.	11,209 0 0
Farr	11,143 0 0
Parkington & Son, Ipswich (*accepted*)	11,120 0 0

DONCASTER.

For erection of livery stables and motor garage. Mr. John Simmons, architect, Doncaster.

Gill & Son	£1,007 0 0
Anelay	998 0 0
Mullins & Richardson	992 0 0
Sprakes & Sons, Doncaster (*accepted*)	960 0 0

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Lawless, plasterer.
Comb & Son, joiner.
Anderson & Son, plumber.
Roger & Doig, brickwork.
Brown & Gow, painter.

For structural steelwork for additions to public baths. Mr. Jas. Thomson, city engineer, Dundee.

Brettell & Co.	£1,642 15 0
Somervail & Co.	1,037 4 11
Orr, Watt & Co.	964 0 9
Russell	949 0 0
Findlay & Co.	941 4 9
Redpath, Brown & Co.	898 16 2
Braby & Co.	897 8 6
Beath & Keay	870 5 10
Keay	866 8 9
Fleming Bros.	847 4 8
Nicoll & Co.	843 3 0
Steel Construction Co.	838 14 2
Brownlie & Murray	834 14 7
Bladen & Co.	823 13 1
Mundy	797 7 7
Clyde Structural Iron Co., Glasgow (*accepted*)	761 16 0

GRAYS.

For alterations at Duvals, Meesons Lane, Grays. Mr. C. M. Shiner, 10 John Street, Adelphi, W.C., and Grays.

Lawrence	£273 15 0
Brown	185 0 0
Brown Bros., Grays (*accepted*)	168 0 0

HASTINGS.

For alterations and repairs at the Union Offices, 11 Wellington Square. Messrs. Jeffery & Son, architects, Hastings.

Fair	£2,063 0 0
Thorpe	264 14 0
Goodwin	231 4 0
Barter	230 0 0
Lester & Son	227 0 0
Burton	220 0 0
Hayhurst & Richford	218 11 6
G. & P. J. Fryer	212 0 0
Harvey	204 6 6
Geary & Co., 159 Bexhill Road (*accepted*)	165 0 0

HEATHFIELD (SUSSEX).

For the erection of recreation hall for Messrs. Reed & Ticehurst. Mr. Arthur H. Burtenstow, P.A.S.I., architect, 7 Bolton Road, Eastbourne.

O'Connor	£2,177 0 0
Collins	2,159 0 0
Rich	2,150 0 0
Sievier	2,040 0 0
Harmer (*accepted*)	1,787 0 0

HEXTHORPE.

For extensions to St. Jude's Church, Hexthorpe, Doncaster. Mr. J. Simmons, architect, Doncaster.

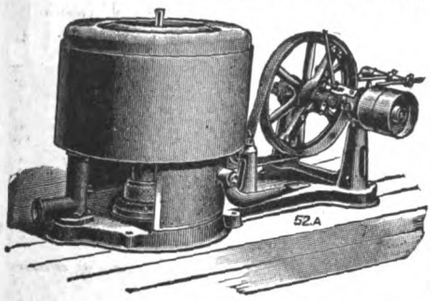
Gill & Son	£827 0 0
Sprakes & Sons	815 0 0
Anelay	748 10 8
Mullins & Richardson, Doncaster (*accepted*)	667 10 6

LONDON.

For the erection of foundations, &c., required in connection with the installation at the Elephant and Castle substation of two 1,500 k.w. rotary converters.

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Holloway Bros.	865 0 0
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Architect's estimate	982 0 0

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Siemens Bros. & Co.	34,326 15 10
Glover & Co.	33,456 15 10
Johnson & Phillips	32,990 10 0
Callender's Cable and Construction Co.	32,768 16 8
Western Electric Co.	32,417 15 0
Henley's Telegraph Works Co.	32,402 15 0
Prescot (*accepted*)	31,999 12 2
Union Cable Co.	31,996 12 0
British Insulated and Helsby Cables, Chief officer's estimate	38,000 0 0

For the roadwork and platelaying connected with the reconstruction of the Highgate Hill tramways.

Bower Bros.	£26,713 3 2
Mowlem & Co.	22,744 2 6
Dick, Kerr & Co.	21,311 12 3
Trentham	19,943 0 0
Brebner & Co.	19,920 5 6
Manders	19,695 8 11
Coles, Paddington (*accepted*)	19,101 8 7
Chief engineer's estimate	20,052 3 6

For the supply and delivery of the steelwork (18 tons) required for the alterations necessary to the bridge carrying Brockley Road over the South-Eastern and Chatham Railway at Crofton Park station in connection with the construction of the tramways in Brockley Road.

	Per Ton.
The Horseley Co.	12 10 0
Handyside & Co.	12 10 0
Findlay & Co.	11 12 6
The Cleveland Bridge and Engineering Co.	11 10 0
Morton & Co.	11 0 0
The Motherwell Bridge Co.	11 0 0
E. C. & J. Keay	10 15 0
Westwood & Co., Millwall (*accepted*).	10 15 0

LONDON *—continued.*

For the supply and erection of the steam, exhaust, feed and drain piping, valves, water tanks, &c., required for the final portion of the Greenwich generating station.

Shelby Manufacturing Co.	£9,268 0 9
Wilson & Co.	8,440 2 10
Bennett & Son	8,173 17 9
Oakes & Co.	8,151 10 9
Stewarts & Lloyds	8,010 13 6
The Railway and General Engineering Co.	7,999 12 6
Babcock & Wilcox	7,768 4 5
Foster Bros.	7,760 6 5
Spencer	7,746 8 7
Le Bas & Co.	7,642 6 5
Staveley Coal & Iron Co., Chesterfield (*accepted*)	7,344 18 5
Chief officer of tramways estimate	9,000 0 0

For erection of Woolwich tramways sub-station.

		Additional for Teak Framing.
Roberts & Co.	£5,360 0 0	£49 10 10
Mowlem & Co.	4,983 0 0	24 6 7
Holloway Bros.	4,900 0 0	46 10 11
Thomas & Edge	4,882 0 0	13 8 4
J. & C. Bowyer	4,835 0 0	38 14 9
Leslie & Co.	4,782 0 0	43 7 8
Munday & Sons	4,759 0 0	38 15 4
Kirk & Randall (*accepted*)	4,747 0 0	33 16 11
Holloway, Deptford (*withdrawn*)	4,327 0 0	30 17 3
Architect's estimate	4,865 0 0	—

For repaving Parish Street and portions of Great Maze Pond, Bermondsey. Mr. R. J. Angel, M.Inst.C.E., borough surveyor.

	Parish Street.	Great Maze Pond.
Woodham & Sons	£706 3 0	£806 5 2
Complete Wood Flooring Co.	577 4 3	682 19 7
Mowlem & Co.	540 15 7	628 9 9
Acme Flooring and Paving Co.	520 6 5	594 18 8
Griffiths & Co.	499 18 5	565 12 2
Angel (borough surveyor) (*accepted*)	499 15 5	564 15 7
Improved Wood Pavement Co.	485 3 1	538 11 0

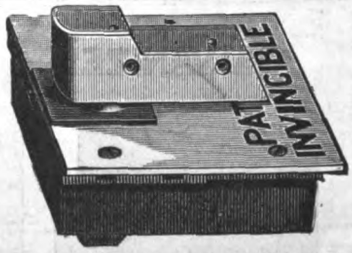
WM. DUNCAN TUCKER & SONS, LD.
TELEPHONE 2 TOTTENHAM. TOTTENHAM. N. TELEGRAMS "HORTICOLE LONDON"
JOINERY OF EVERY DESCRIPTION
MOULDINGS TO ANY DESIGN



NEWMAN'S PATENT REGULATING HELICAL SPRING HINGES.
WITH PATENT STOP TO PREVENT OVERWINDING.
The power can be instantly taken off while the Hinges are being fixed and afterwards adjusted to close the door conveniently. They cannot be overwound.
Made in Brass and Iron, 3, 3½, 4, 4½, 5, 6, and 7 inches.



NEWMAN'S NORTON SYSTEM.
MADE IN MALLEABLE IRON.
The Best Door Spring and Check for closing doors without noise.
Pressure is direct, but diminishes pleasantly as door is opened.
Also made with Patent Regulator to latch stubborn bolts.



NEWMAN'S PATENT INVINCIBLE,
WITH AND WITHOUT PNEUMATIC CHECK.
Will hold door *rigidly to centre*, but diminishes in power as door is opened, allowing comfortable passage through.
The *Best* Spring to close door *against wind pressure*, and the most suitable for Banks, Schools, and other public buildings. Made in sizes to suit all doors.

Made solely by W. NEWMAN & SONS,
DOOR SPRING MAKERS AND BRASSFOUNDERS,
Established over 100 Years. HOSPITAL ST., BIRMINGHAM.

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LONDON—*continued.*

For the installation of a scheme of mechanical ventilation at Hungerford House, Victoria Embankment, London, for the London County Council.

Musgrave & Co.	£392	9	0
G. & E. Bradley (*received too late*)	251	7	6
Standard Engineering Co.	200	2	6
Alldays & Onions	195	15	0
Matthews & Yates (*accepted*)	164	0	0

For supply of pipes, &c., in connection with mains over Blackfriars Bridge, for the Metropolitan Water Board.

Steel pipes, &c.

J. Fraser & Son	£1,307	5	0
Fraser & Fraser	1,110	0	0
Piggott & Co.	999	17	6
Stewarts & Lloyds (*recommended*)	797	5	6

Six Steel Pipes.

J. Fraser & Son	93	0	0
Fraser & Fraser	69	0	0
Stewart & Lloyds	55	0	0
Wilson & Co.	48	0	0
Babcock & Wilcox	44	0	0
Piggott & Co. (*recommended*)	43	0	0

For alterations and additions at the police station, Kennington Road, S.E. Mr. J. Dixon Butler, F.R.I.B.A., architect, surveyor to the Metropolitan Police, New Scotland Yard.

Ansell	£8,080	0	0
Harris & Wardrop	7,823	0	0
Shurmur & Sons	7,790	0	0
Smith & Son	7,681	0	0
Higgs & Hill	7,644	0	0
Holloway Bros.	7,600	0	0
Lathey Bros.	7,597	0	0
Minter	7,590	0	0
F. & H. F. Higgs	7,513	0	0
Sabey & Son	7,467	0	0
Rice & Sons	7,272	0	0
Mowlem & Co.	7,122	0	0

LONDON—*continued.*

For the execution of the necessary alterations to the bridge carrying Lower Road, Deptford, over the East London Railway, London, for the London County Council.

Shellabear & Sons	£22,671	2	0
Jackson	19,445	12	9
Coles	19,406	17	9
Mowlem & Co.	18,152	0	0
Pedrette	15,864	6	6
Fasey & Son	15,835	18	0
Cleveland Bridge and Engineering Co.	15,759	14	2
Palmer	15,490	11	8
Woodham & Sons	15,084	18	4
Westminster Construction Co.	14,797	14	6
Dick, Kerr & Co.	14,772	19	5
Findlay & Co.	14,686	12	6
Cochrane & Sons	14,685	18	2
Thorne & Sons	14,574	8	0
Mitchell Bros.	14,332	3	6
Bentley & Son	14,149	15	2
Smith & Co.	14,018	9	1
Muirhead & Co.	13,720	14	0
Brebner & Co.	13,380	0	10
Rowlingsons & Co., Quality Court, E.C. (*accepted*)	12,872	13	6
Dinnie	12,641	0	1
Chief engineer's estimate	13,000	0	0

For construction of steel stand pipe, for the Metropolitan Water Board.

Mechan & Sons	£1,500	0	0
Somervail & Co.	1,500	0	0
Fraser & Fraser	1,390	0	0
Braithwaite & Kirk	1,368	0	0
Clayton, Son & Co.	1,261	0	0
J. Fraser & Son	1,243	0	0
Head, Wrightson & Co.	1,200	0	0
Piggott & Co.	1,180	0	0
Westwood & Wrights	1,125	0	0
Newton, Chambers & Co.	1,063	0	0
Kirk & Randall	1,040	0	0
C. & W. Walker (*accepted*)	1,002	0	0

DURESCO

THE KING OF WATER PAINTS.

The FIRST in the Field. The FOREMOST ever since.

THE SILICATE PAINT CO.

Made and sold a Water Paint in 1875.

30 Years' Experience has stamped

DURESCO

as being the premier Water Paint.

SOLE MANUFACTURERS—

THE SILICATE PAINT CO.,

J. B. ORR & CO., Ltd.,

CHARLTON, LONDON, S.E.

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LONDON—*continued.*

For supply of a coal transporter to the Hammersmith pumping station, for the Metropolitan Water Board.

Fraser & Chalmers	1,554 0 0
Babcock & Wilcox	1,280 0 0
Strachan & Henshaw	1,240 0 0
C. & A. Musker	1,075 0 0
Renshaw & Co.	975 0 0
Chatteris Engineering Works Co.	960 0 0
Applebys, Ltd. (*recommended*)	960 0 0

NANTWICH.

For erection of new shops, Nantwich. Messrs. Bower & Edleston, A.R.I.B.A., architects, Nantwich.

Dodd & Son	£4,150 0 0
Manley	3,225 0 0
Harding	3,155 0 0
Matthews	2,987 10 0
Cox & Vaughan	2,640 0 0
Gresty	2,538 8 0

OWSTON FERRY, NEAR DONCASTER.

For erection of a pumping station and works in connection therewith adjoining the River Trent, at Owston Ferry, for the Haxey and Owston Drainage Board. Mr. John Simmons, M.I.C.E., engineer, Doncaster.

Buildings.

Wade & Co.	£3,568 13 0
Jenkinson	2,629 8 1
Connell	2,354 3 0
Arnold & Son	2,282 0 0
S. R. & T. Kelsey	2,250 6 0
Wellerman Bros.	2,217 16 3
Pumfrey	2,200 0 0
Clayphan, Owston Ferry (*accepted*)	2,153 0 0
Sprakes & Sons	2,149 10 0

OWSTON FERRY—*continued.*

Pumping machinery.

Stewart & Co.	2,226 0 0
Gwynnes	2,212 0 0
Ruston, Procter & Co.	2,170 0 0
Tangyes	2,025 0 0
Marshall, Sons & Co., Gainsborough (*accepted*)*	1,988 0 0

* With additions increased to 2,060*l.*

ROTHERHAM.

For extension of Dalton and Thrybergh sewage works. Mr. B. Hey, surveyor, Rotherham.

Bushby & Sons	£2,848 0 0
Stark & Sons	2,771 0 0
Dickinson	2,676 0 0
Ashley	2,675 0 0
Cooper	2,570 0 0
Braithwaite & Co.	2,569 0 0
Morley & Sons	2,564 0 0
Buckley	2,471 0 0
Cottle	2,439 0 0
Wellerman Bros.	2,353 0 0
Beeden	2,336 0 0
Trehern	2,317 0 0
Gray & Sons, Tinsley (*accepted*)	2,126 0 0

SCOTLAND.

For erection of new infant school at Gardens Town, Gamrie, for the Gamrie School Board.

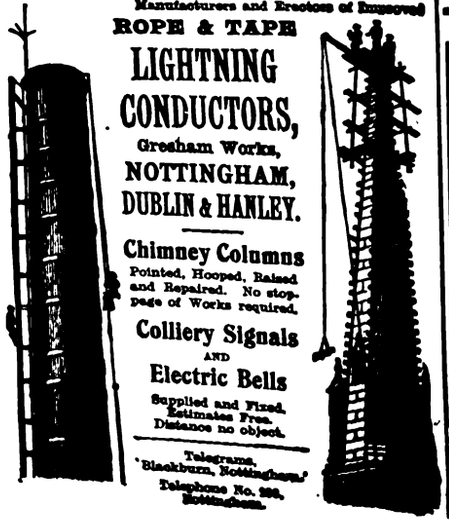
Accepted tenders.

Mitchell, Huntly, mason	£748 8 9
Levenie, Banff, carpenter	215 0 0
Watson, Banff, plumber	131 17 0
Simpson, Macduff, plasterer	66 11 2
Morrison, Aberdeen, slater	53 0 0
Chalmers, Banff, painter	23 7 2

"There is nothing like the 'GOOD ARTICLE.'"
THE HAND LIFT
SPECIALISTS.
ELECTRIC LIFTS.
JAMES RITCHIE & SONS,
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MARSHALL & CO.
Architectural Modellers,
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SULGRAVE ROAD, HAMMERSMITH, LONDON, W.
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BLACKBURN, STARLING & CO.
LIMITED,
Manufacturers and Erectors of Improved
ROPE & TAPE
LIGHTNING CONDUCTORS,
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NOTTINGHAM,
DUBLIN & HANLEY.
Chimney Columns
Pointed, Hooped, Raised and Repaired. No stoppage of Works required.
Colliery Signals
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Electric Bells
Supplied and Fixed. Estimates Free. Distance no object.
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Security £4,607,705.
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FIRE — ACCIDENT — MARINE
This Company also issues Policies covering
LOSS OF PROFITS AND INCOME
occasioned by Fire.

SAVE 50%
OF YOUR
COAL BILL
BY USING THE PATENT
"SINE QUA NON" KITCHEN RANGE.
[Copy] RECENT TESTIMONIAL.
46 Newcastle St., London, E.
June 8, 1909.
Gentlemen,—You will no doubt be pleased to hear that the "Sine Qua Non" Range we recently had from you is giving every satisfaction; we understand that the amount of coal consumed is practically one half of what the old range consumed.
We are, Gentlemen, yours faithfully,
(Signed for A. Haton & Co., Ltd.,)
J. H. Stonehouse, Director.
This unsolicited testimonial, with many others, may be seen at, and Catalogues obtained on application to, the Sole Manufacturers,
WILMER & SONS,
11-14 BURY STREET, LONDON, E.C.,
where the above may be seen in action.

ESTD 1836
THE LIVERPOOL AND LONDON AND GLOBE INSURANCE COMPANY
Total Assets Exceed £11,000,000.
FIRE, LIFE,
— ANNUITIES, —
PERSONAL ACCIDENT,
Burglary, Workmen's Compensation (including Domestic Servants), Sickness, Fidelity Guarantee, Motor Car, Plate Glass, Loss of Profits, &c.
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Applications for Agencies Invited.

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SCOTLAND—*continued.*

For alterations and additions to Bracoden school, Gamrie, for the Gamrie School Board.

Accepted tenders.

Mitchell, Huntly, mason	£505 0 0
Milne, Forgue, carpenter	409 0 0
Watson, Banff, plumber	219 17 0
Massie, Macduff, plasterer	132 9 0
Currie & Co., Aberdeen, slater	89 12 9
Watt, Banff, painter	50 15 3

SCUNTHORPE.

For the erection of a Primitive Methodist Institute. Mr. W. H. Buttick, P.A.S.I., architect, Scunthorpe.

Wilson	£813 18 0
Quible	750 0 0
Pallister	710 0 0
Buckley	708 0 0
Thompson, Scunthorpe (*recommended*)	699 0 0
Smith Bros.	671 11 0
Crossland	595 0 0
Architect's estimate	750 0 0

SELSDEN (YORKS).

For the construction of additional tanks, channels and other works, for the improvement and extension of the existing sewage disposal works of the Urban District Council. Messrs. Chas. Gott & Son, engineers, 18 The Exchange, Bradford.

Stark & Son	£1,585 5 9
Bushby & Sons	1,527 17 0
Vickers	1,442 4 3
Graham & Sons	1,379 0 0
Sugden	1,320 4 8
Ward & Tetley	1,318 4 0
Morley & Sons	1,264 0 0
Schofield	1,239 10 5
Barrick	1,219 4 4
Barker	1,204 17 10
Baker	1,180 5 1
Brigg, Bradford (*accepted*)	1,178 6 0

SHALFORD.

For sewerage works, for the Hambledon Rural District Council, Surrey. Mr. Henry Moon, surveyor, Godalming.

Wheeler & Co.	£13,247 0 0
Iles	10,810 0 0
Trueman & Co.	10,750 0 0
Bell & Son	10,690 0 0
F. Osenton	9,638 0 0
Rayner	9,505 0 0
Franks	9,284 8 8
Hardy & Co.	8,960 0 0
Brebner & Co.	8,862 10 0
Bower Bros.	8,716 3 4
Osman	8,596 0 0
G. A. Osenton	8,500 0 0
Douglas	8,257 0 0
Streeter & Co., Shalford (*accepted*)	7,752 0 0

UPWEY BRIDGE.

For alterations, additions and repairs to Upwey Manor House, Dorsetshire. Mr. R. E. Brinkworth, F.S.I., architect, Old Bond Street, Bath.

Jenkins & Sons	£2,077 0 0
Hayward & Wooster	1,954 0 0
Long & Sons	1,891 0 0
Jooty & Baker	1,881 9 6
Erwood & Morris	1,802 0 0
Conway, Weymouth*	1,735 13 6

* Accepted subject to amendments.

WALES.

For the erection of twenty-eight cottages at Bargoed, for the Bargoed Building Club. Mr. Idris Leyshon, architect, Bargoed.

Williams & Sons	£161 10 0
Jenkins Bros.	155 7 0
Lewis Bros.	152 7 0
Vodden & Lee	149 15 0
Watkens	148 0 0
Davies, Bargoed (*accepted*)	144 17 6

THE "TILT" FIRE.

WITH THE "TILT" FIRE YOU CANNOT FAIL TO GET A BRIGHT FIRE IN A FEW MINUTES.



The tilting arrangement is so simple that there is nothing to get out of order. No other hearth fire has such advantages. Many hundreds already sold.

POINTS:—Clean Hearth.
Quick or Slow Combustion.
Saving of Fuel.
Cure for Smoky Chimneys.

PRICES FROM 39/3.

Write for Full Particulars and New Designs.

THE

Coalbrookdale Co., Ltd.,

15 & 16 Rathbone Place, Oxford Street, W.

Works:

The Coalbrookdale Co., Ltd., Coalbrookdale, R.S.O., Shropshire.

***Bristol Showroom:* West India House, Welsh Back.**

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WOLVERHAMPTON.

For high school for girls. Messrs. J. Hutchings, Stafford, and Fleeming & Son, joint architects, Wolverhampton. Quantities by Messrs. Vale & Kingsford, Wolverhampton.

Hickin	£21,600	0	0
Thompson	21,333	0	0
Jonas	20,912	0	0
Wilson & Son	20,105	0	0
Bowen & Son	19,893	0	0
Whitehouse & Son	19,647	0	0
Willcock & Co.	19,643	0	0
Speake & Son	19,600	0	0
T. & S. Ham	18,980	0	0
Cave & Son	18,740	0	0
Gough & Son	18,700	0	0
Lovatt, Wolverhampton (*accepted*)	18,521	0	0
Heating.			
Dargue, Griffiths & Co.	1,339	0	0
Killick & Cochran	1,230	0	0
Ashwell & Nesbitt	1,170	0	0
Taylor	1,135	0	0
Brightside Foundry Co.	1,120	0	0
Hadan & Sons	1,070	0	0
Manley & Co., Wolverhampton (*accepted*)	1,016	0	0
Lighting.			
Ellis & Ward	475	5	0
Geary, Adams & Co.	394	4	6
Dargue, Griffiths & Co.	360	6	10
Wolverhampton Electric Co.	296	0	0
District Electric Co., Wolverhampton (*accepted*)	260	0	0

The London County Council on Tuesday accepted an offer of 4,500*l.* from Mr. E. J. Horniman, M.P., for the provision of a lecture hall at the Horniman Museum, Forest Hill. The two conditions made are:—(*a*) The architectural designs shall be subject to the donor's approval; (*b*) that at least forty-eight lectures are given each year to teachers or children without charge for their admission.

ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 18, MR. CHARLES HENRY HEATHCOTE, F.R.I.B.A.

NO. 19, PROFESSOR F. M. SIMPSON, F.R.I.B.A.

THIRD PREMIATED DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

FIRST AND SECOND PREMIATED DESIGNS, DEPTFORD BRANCH LIBRARY COMPETITION.

Received too late for Classification.

LONDON.

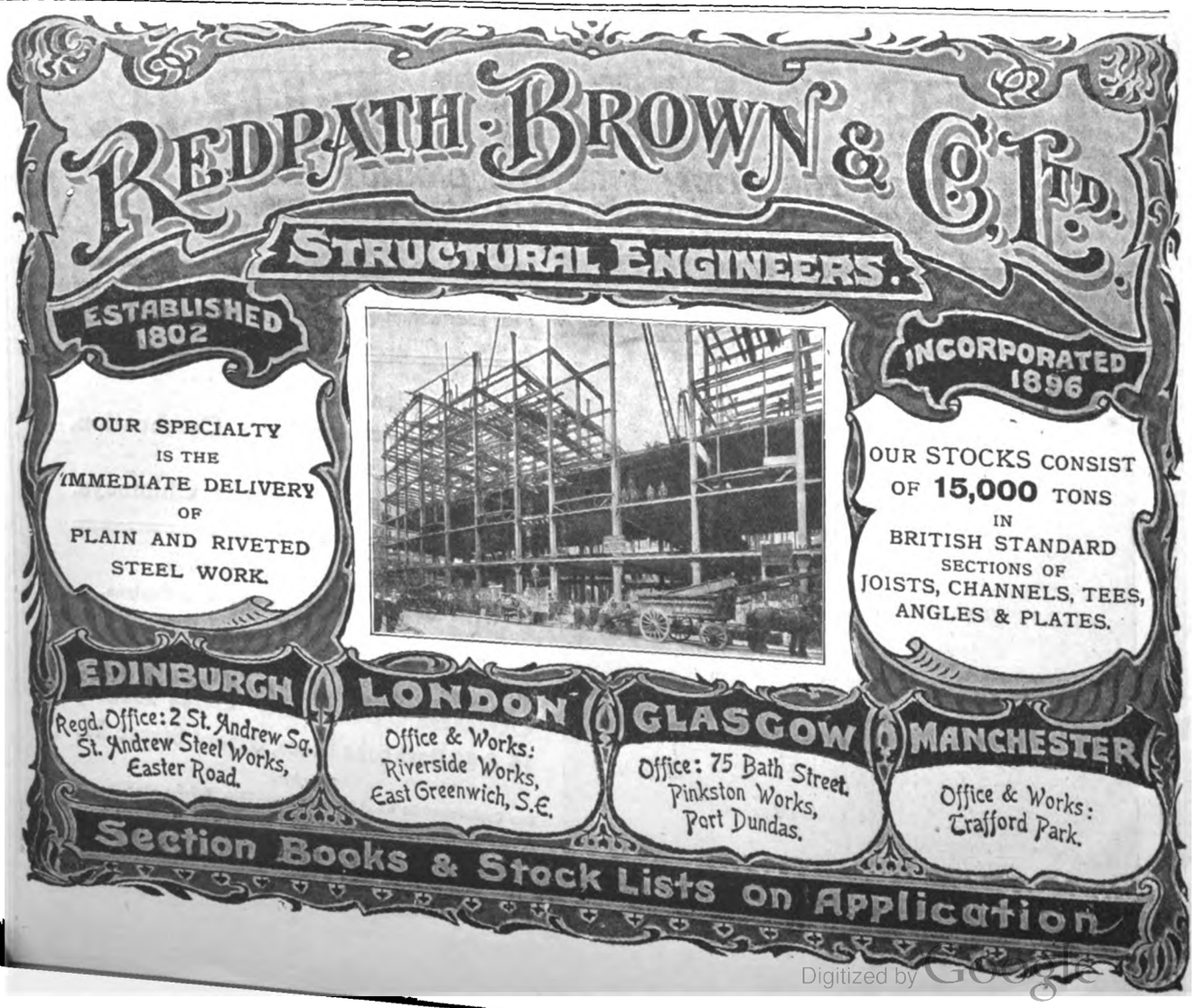
For alterations and improvements at Messrs. Sharp, Perrin & Co.'s premises, Cannon Street, Old Change, and Watling Street. Messrs. Still, Wheat & Luker, architects and surveyors, 19 Basinghall Street, E.C.

Roffey & Sons*	£10,083	0	0
Holloway Bros.*	10,070	0	0
Allen & Co.	9,825	0	0
Saunders*	9,700	0	0
Colls & Sons*	9,634	0	0
Ashby Bros.	9,390	0	0
Williams	9,327	0	0
Holland & Hannen, London (*accepted*)	9,292	0	0
Greenwood*	9,286	0	0

* Subject to extension of time clause.

A *résumé* of the life and work of Mr. J. W. Waterhouse, R.A., will be published from the office of the *Art Journal* at the end of this month. The monograph will contain over forty illustrations, including a hand-printed etching and four plates in colours.

Mr. Owen Alfred Ellis, of Leicester, builder's merchant, carrying on business in partnership with Mr. A. B. Partridge under the style of Ellis, Partridge & Co., who died at Crowborough on July 27, aged forty-eight, left estate valued at 29,923*l.* gross, with net personalty 20,060*l.*



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TRADE NOTES.

The Expanded Metal Co., Ltd., inform us that they have appointed Mr. B. J. Miller, one of their works' representatives, to succeed the late Mr. Harry Mason as their representative in Manchester and district. The company's Manchester address has been changed to Temple Chambers, 33 Brazenose Street, Manchester.

Under the direction of Mr. W. J. Smith, architect, Market Harborough, the "Boyle" system of natural ventilation, embracing the latest patent "air-pump" ventilators and air inlets, has been applied to the Rothwell Congregational Church.

Messrs. Wm. Potts & Sons, Ltd., Leeds and Newcastle, have received instructions to make and fix a new illuminated quarter chime clock at Holme Bridge Parish Church, near Huddersfield. The new clock and chimes made by Messrs. Potts for St. Cuthbert's Collegiate Church, Darlington, will be dedicated on Sunday next. Messrs. Potts have also another large clock and chimes in the latter district for the South Bank Catholic Church, Middlesbrough.

Mr. Thomas Athey, formerly connected with Messrs. Spencer, Santo & Co., the old-established building contractors, of Warwick Road, Kensington, has joined the staff of the British Uralite Company, of 16 St. Helen's Place, E.C. Mr. Athey's extensive practical experience of all matters appertaining to building operations will be at the service of the Company's clients in estimating for the erection of buildings constructed of its various well-known fire-proof materials. The company has an extensive connection with various Government departments, and with most municipal bodies, which it is believed the foregoing arrangement will tend to extend.

Two leaflets have come to us from Kynoch, Ltd., Birmingham; the one deals with their patent roller bearings, and the other with their self-oiling bearings. The Kynoch roller bearing was introduced twelve years ago, and has been since improved until its co-efficient of friction of repose and motion is about one-tenth that of an ordinary bearing. It is calculated that by carrying the main and counter shafting on their patent bearings a saving of from 50 to 75 per cent. of the power used to drive the shafting will be effected. The Kynoch self-oiling bearing is so successful that one charge of suitable oil will last a year; this is due to the fact that there is absolutely no leakage, and the bearing is dust proof. Kynoch, Ltd., especially advocate their employment abroad. Both these patents are of great importance to the machinery user.

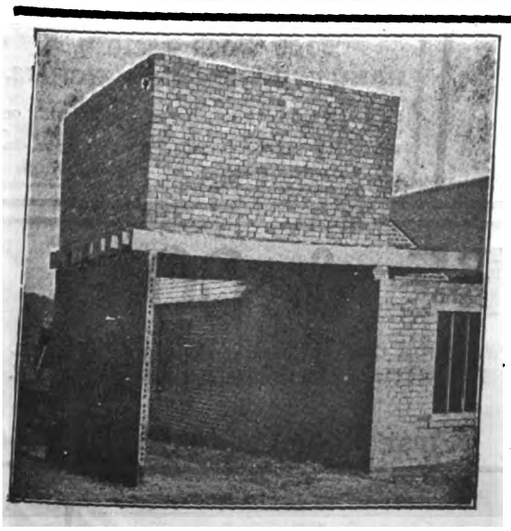
The Ratner Safe Company boast a record that no Ratner improved fire-resisting safe has ever had its contents destroyed by fire, and no Ratner thief-resisting safe has ever been opened by burglars. Their invulnerability to fire has been demonstrated in many conflagrations, one recent occasion being the fire in August last in Ingram Street, Glasgow, when damage was done to the value of 250,000*l*. A safe belonging to Messrs. T. McBride & Logie passed through the ordeal so successfully that although the safe was hot for four days its contents remain undamaged. An even severer test was carried out a few months ago in Bloemfontein to show that Ratner safes were capable of complete fire-resistance under worse conditions than those occurring at a fire in the local Government buildings, when the contents of several safes were irretrievably ruined. The official firemaster placed a List 2 fire-resisting safe No. 4½ on a wooden framework; between the framework and underneath the safe was placed 200 lb. of coal and small blocks of timber heavily coated with tar. A 5-foot brick wall was built around it, allowing a space of 12 inches all round between the safe and the wall. In this space another 200 lb. of coal was packed, also heavy timbers coated with tar and sprinkled wih 5 gallons of paraffin. On the top was placed heavy lumps of coal right round. Further quantities of tar and paraffin were finally sprinkled over the top. The fire lasted nearly four hours. On the following day the safe was opened with a key without difficulty in the presence of Government officials. The contents (including a thermometer, a box of matches, books, tissue, grease and art paper) were perfect, the only exception being some paraffin wax, which had melted. The test was a revelation to most of the spectators as to the capabilities of modern fire-resisting safes.

WHAT ARE THE USES OF URALITE?

URALITE, the only material of its kind **MADE IN ENGLAND,**
is in great demand for
ROOFING, CEILINGS, PARTITIONS, WALLS,
in buildings of every description.
Uralite is the **Best Fire-Resisting Material in the World.**

APPLY FOR PAMPHLET "WHAT IS URALITE?" TO

The BRITISH URALITE COMPANY (1908) Ltd.
16 St. Helen's Place, London, E.C.



Hempstead Patent Brick Co.

Works: Redbourn Road. **Hemel Hempstead, Herts.** Telegrams: "Blocks, Hemel Hempstead."

"HEMPSTEAD"

FIREPROOF PARTITION BLOCKS, FLOOR BLOCKS AND CASINGS,

All guaranteed Fire Resisting to the Melting Point of Steel.

Three-inch Wall of Hollow Partition Blocks sustaining Distributed Floor Load of 660 lbs. per foot super.

PATENT FIREPROOF DOORS.

Price Lists and Reports of Tests on application.

London Office: Joseph Clayton, 77 Queen Victoria Street, E.C.

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BUILDING AND BUILDERS.

The Gillingham Town Council last week passed plans for seventeen houses and two shops.

The Cheshire education committee have decided on the enlargement of the Agricultural and Horticultural College at Holmes Chapel, at a cost not exceeding 6,000*l.*

At the last Weybridge Council meeting it was reported that plans had been submitted by Mr. W. G. Tarrant for the development of Brooklands estate.

The Epsom Urban Council are having plans prepared for a sludge disposal scheme estimated to cost 4,030*l.* Tenders will shortly be invited. A proposal that the surveyor's department should be allowed to tender has been rejected.

The Huddersfield Board of Guardians on Monday considered three schemes for the erection of a tuberculosis sanatorium on Honley Moor, and decided in favour of building a home for twenty patients at a cost of 4,000*l.*

The *Liverpool Courier* on Tuesday announced that the Midland Railway Company, who had passed a scheme for the rebuilding of the Adelphi Hotel, Liverpool, at an estimated cost of over 600,000*l.*, have, owing to the Budget proposals, indefinitely postponed the project.

Messrs. L. & C. Hardtmuth are about to erect new premises in Kingsway, to be known as "Koh-i-noor House." The designs have been prepared by Mr. J. S. Gibson, of 5 Old Bond Street, and the builder is Mr. Jas. Carmichael, of Wandsworth.

At the Coatbridge Dean of Guild Court lining was granted last week to the Wilson and Union Tube Company to make extensions at their works at a cost of between 3,500*l.* and 4,000*l.* This erection will be 465 feet by 130 feet. Messrs. Stewarts & Lloyds were granted lining to erect an electric supply branch at the British Tubeworks. An application by the Waverley Iron and Steel Company for lining to erect a laboratory at their works was continued sine die.

The Old Kilpatrick School Board, N.B., have under consideration the question of a new higher grade school for Clydebank. Last week the master of works submitted a new plan showing a two-storey building, and costing about 17,000*l.* Before coming to a final decision it was resolved to visit higher grade schools in other places. The master of works also submitted plans of a new board room, &c., but it was agreed to leave over their adoption in the meantime.

The Edinburgh Dean of Guild Court has granted a warrant to the Commissioners of Works for the addition of another storey and alterations to the Central Post Office in Edinburgh. At the same meeting on the 7th inst. the Court had before it a petition from the Commissioners for a warrant for the erection of laboratories at the Royal Botanic Gardens. Dean of Guild Wilson said the Court would like the front kept 30 feet back from the centre of Inverleith Row. The plans showed 25 feet. He also expressed some doubts as to the drains, the fall being slight. It was agreed to continue the application.

The Devon County Council at their last meeting accepted the following tenders for works at their schools:—Beaford Council school, alterations and repairs, Messrs. Ridge & Shute, 80*l.* 10*s.*; Kenton Mixed Council school, new drainage, &c., Messrs. Page Bros., 72*l.* 10*s.*; Littleham and Landcross Council school, alterations and repairs and new house for teacher, Mr. A. Darch, 777*l.* 4*s.* 4*d.*; Shebbear Council school, repairs, Mr. H. Grant, 41*l.* 10*s.*; Ugborough Council school, alterations, Mr. F. J. Badcock, 65*l.* 14*s.*; Westleigh Council school, new boundary wall, Messrs. Ridge & Shute, 38*l.*; Werrington Council school, covered shed, Messrs. R. Adams & R. Soper, 31*l.*

At the last meeting of the buildings committee for the First or Upper District Committee of the County of Renfrew, it was intimated that plans for new buildings had been lodged of which the total value was 68,710*l.* In the corresponding period of last year the value was 10,740*l.* Among the plans were the following:—Nine flatted cottages and four shops at the corner of Crow Road and Whittingehame Drive, Jordanhill, for W. M. Whyte, 87 Union Street, Glasgow; four tenements in Newlands Road, Cathcart, for Robert Jackson, 121 Alexandra Parade, Glasgow; two tenements at Clarkston Toll, Clarkston, for the trustees of the late Robert Burns Ure; five tenements in Holmlea Road and new street to the north of Holmlea School, Cathcart, for Messrs. George Eadie & Sons, 405 Mathieson Street, Glasgow; double cottage in Slaymanhill Road (road to Overlee), Clarkston, for James Merry, 106 Smith Street, Govanhill; terrace of ten cottages and a double villa in a

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proposed new street off Carmunock Road, King's Park, Cathcart, for Messrs. John Dickie & Son, King's Park Road, Mount Florida; two double villas in Busby Road, Giffnock, for John Allan, 60 Reidvale Street, Glasgow; terrace of twelve cottages in new street off Busby Road, Giffnock, for James M'Luskey, 131 Hospital Street, Glasgow; double villa at Mansewood for A. M'Lellan, builder, Pollokshaws; tram car depôt at Newlandsfield for the Glasgow Corporation Tramway Department; terrace of fourteen cottages in Selbourne Road, Jordanhill, for Messrs. William Downs & Sons, Glasgow Road, Uddingston; one two-storey tenement off Polnoon Street, Eaglesham, for James Brown, 697 Duke Street, Glasgow.

VARIETIES.

The first of a series of five lectures on "Sanitary Building Construction" was given by Mr. H. D. Searles-Wood, F.R.I.B.A., at Carpenters' Hall, London Wall, on Thursday evening.

Mr. N. F. Spence, sanitary inspector and surveyor to the Leake Rural District Council, has been selected out of 143 candidates for the same post to the Hartshorne and Seals Rural Council.

The Leith Town Council, N.B., have appointed a committee to inquire into the advisability of erecting a public hall with or without a public library on ground belonging to the Corporation at Leith Walk.

The Yeovil Town Council have received a letter from the Local Government Board granting the application of the Yeovil Town Council for powers to borrow 27,500*l.* for the purpose of reconstructing the sewerage and sewage works of the borough.

The Rugeley Urban District Council last week passed the following plans:—A new house in Fortescue Lane for Mr. F. Upton; two villas, Market Street, for Mr. F. Hill; and a Jubilee Hall and Institute for the Foresters' Society in Anson Street.

The city engineer of Sheffield has been instructed to prepare plans, specifications, estimates and quantities, in respect of a bridge to be constructed over the river Sheaf, in connection with the proposed new street from Waingate to Furnival Road.

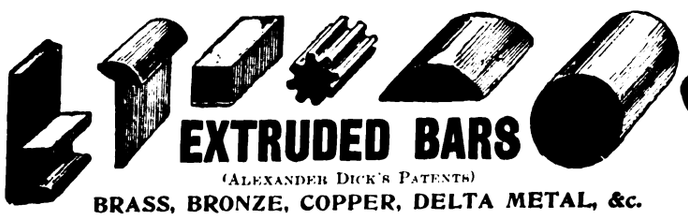
It has been reported to the Leeds City Council that the work done by unemployed men in connection with the Corporation afforestation scheme was far from satisfactory, and that 40 per cent. of the trees planted had been lost. It was estimated that the value of the work of these unskilled men was not more than one-sixth of that of skilled planters.

The foundation stone of Christ Church Congregational Church, New Southgate, N., was laid on the 9th inst. The design is in late Gothic. Bath stone is being used for the dressings, pressed red bricks for the facings, pitchpine for the joinery. The contract is let for 4,597*l.* to Mr. Jas. W. Jerram, Crown Works, East Ham, E.; the architects are Messrs. George Baines & Son, 5 Clement's Inn, Strand, W.C.

The South Shields electrical committee recommend application for a loan of 8,500*l.* for the purpose of extending the station plant. The engineer estimates the cost as follows:—Engine and generator, 5,700*l.*; pipe work, 450*l.*; buildings and foundations, 950*l.*; circulating pump and tank complete, 700*l.*; crane, 300*l.*; and contingencies, 400*l.*

The burgh surveyor of Perth has submitted to the city hall committee of the Town Council a sketch plan of the proposed Session House. The committee have also considered proposals by the City Chamberlain, on behalf of the East Parish Church Session, with reference to the erection of a hall for the church in conjunction with the new Session House. It has been resolved to leave it to the Kirk Session of the East Church to negotiate with an adjoining proprietor for the acquisition of additional ground for the erection of the new Session House and proposed hall, and to report to the committee.

Mr. W. G. Lovell, of Bedford, and late of the Newport Pagnel Brewery Co., Ltd., who died on July 13 last, left estate of the gross value of 41,889*l.* 9*s.* Of this amount he left about 35,000*l.* upon trust for the erection and endowment of "Sydney Howard Lovell" almshouses. The almshouses are to be built so as to be free from draughts, in red brick, with red tiled roofs, and concrete under wooden flooring, and, if possible, on a site to the east of the schools at Oakley. Each house is to have a small garden in front,





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suitably planted with rose trees, and one at the back partly planted with fruit trees. The occupants are to be either married couples or single persons. The married couples are to receive 10*s.* per week, and single persons 7*s.* 6*d.* per week.

MEASURES BROTHERS, LTD.

The Board of Trade on Monday issued a long report dealing with their enquiry into the affairs of Messrs. Measures Bros., iron merchants, London. The investigation was at the instigation of a shareholders' committee, appointed on the requisition of upwards of 500 shareholders in various parts of the country, representing £200,000 capital. Measures Brothers, Ltd., was founded in 1870 by Mr. Robert H. Measures and his brother, Mr. Richard Isaac Measures, who died a few years ago. In 1899 it was formed into a public limited liability company, with a share capital of £285,000, the goodwill standing at £203,581.

Last year a committee of the shareholders was appointed to investigate into the condition of the company, and in consequence of their report a Board of Trade inquiry was demanded. This was opened in June last by Mr. Archibald Read. His report, just published, deals in detail with the many matters in the company's history which provoked the action of the shareholders' committee. The committee's persistent endeavours have been justified, for a *prima facie* case alleged in their affidavit is said by Mr. Read to have been sustained by the investigation. Their allegation was to the effect that the stock certificates and balance-sheets of the company for 1904, 1905, and 1906 had been falsified, but the report is careful to point out the case made out is *prima facie*, and that it would be unfair, after an inquiry conducted on these lines, to express a final opinion. "To do so," says Mr. Read, "would be unfair to Mr. R. H. Measures, who has not had, in an inquiry conducted on these lines, the advantage of presenting his case and calling and examining and cross-examining witnesses by counsel as at a regular trial, and in whose favour a great many points might be urged, and possibly many witnesses called, particularly late auditors, who might throw a different light on the case."

NEW CATALOGUES.

The Türk system for the hygienic drying of new buildings and damp walls has been steadily growing in general favour. The *modus operandi* has been already explained in these columns, and moreover its general use makes another description unnecessary. But with the approach of the winter season it may not be superfluous to again comment on the facilities that the Türk system offers for the speedy drying of new buildings. For testimony of its efficacy no one can want a more convincing proof than that the German Government employed the system in March last after the River Elbe had broken its banks and flooded about fifty-nine villages and 160,000 acres. The process of drying this immense area was completed in less than four weeks. It may be here mentioned that a freshly plastered room is perfectly dried in one to three days. On the Continent architects nearly always include the drying in the quantities. English architects would be well advised to follow this practice when, as usually happens, the buildings are wanted for immediate use. This escapes the addition of another extra to the building owner's bill. If artificial drying is not required, the amount is saved. The Türk system has been extensively used in this country for large and small house-property, shops and business premises generally; but there appears to be one class of building where it has not yet gained a firm footing, viz., in schools. This is surprising, for such structures would seem to offer a splendid field for its successful employment by the authorities. A special feature has been made of drying strong rooms. Several of the larger towns have agents to whom licences have been granted by Messrs. Setzer & Co., 16 Tariff Street, Manchester.

The General Electric Company, Ltd., have prepared an illustrated pamphlet to indicate some buildings in which the "Osram" lamp has been introduced, such as the Law Courts, the Guildhall, Savoy and Metropole hotels in London, as well as factories, steamships, and railway trains. It is claimed that the Osram lamps are made to burn in any position, and in different shapes and sizes. They will yield the same light at about one-fourth the cost of current incurred with carbon filament lamps, or at approximately

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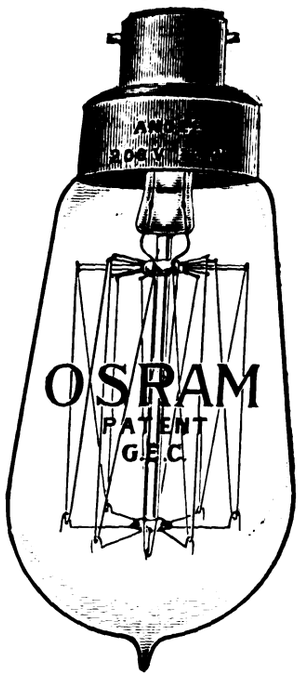


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two-thirds the cost of current used by lamps whose filaments are composed of tantalum metal. The cost is put at twenty hours for one penny. Their average life is 2,000 hours. It is important to mention that no alteration is required to the installation previous to removing the old and wasteful type



of lamp and replacing it with an Osram. Mr. Hassall has designed a large coloured poster for the company, showing a delighted working man and his family sitting at a table brilliantly illuminated by a single "Osram."

The interim catalogue "E" issued by Twyfords, Ltd., is intended as a herald to a larger supplementary catalogue which will shortly be issued. Half of the forty pages are devoted to pedestal lavatories and lavatory basins. The remaining twenty illustrate w.c. basins, urinals, fountain hand basins, and pedestal ccommodes. There are some new designs in the pedestal lavatories. These are modelled with a view to hygienic considerations, and like all the other basins, have roll edges which replace the dirt-collecting sharp edge of yesterday, and in addition reduce the danger of chippings: at the same time they improve the appearance. In any up-to-date sanitary appliance rounded edges and plain surfaces must be substituted for mouldings and angles. Messrs. Twyford have done this, though at the same time they have been able to retain some of their old patterns. All the goods in this small catalogue are made in their fine white "C V" ware, which is guaranteed to be non-crazing, and which is recommended for durability, evenness of surface and purity of colour. Messrs. Twyfords say, "The introduction of new manufacturing processes enables us to make many reductions in price; in numerous instances to a considerable extent."

The following plans were approved by corporate committees of Bolton during September:—Mr. James Arrowsmith, eight houses in Rainshaw Street; and Mr. Geo. Sykes, five houses and shops in Old Road, Astley Bridge. Messrs. Leigh Bros., seven houses in Alexandra Road, Tonge. Messrs. W. & C. Ainsworth, for dynamo house in Weston Street; and Messrs. J. Harwood & Son, for addition to mill in Rishton Lane, Great Lever. Mr. Levinus Taylor, for shops in Chorley Old Road; and Messrs. Leigh Bros. for eight houses in Malvern Avenue, Smithills. Messrs. J. Marsden & Sons, Ltd., for new roof over boiler-house at No. 2 mill in Fletcher Street; the Hippodrome, Ltd., for stores in Back Queen Street; Dr. J. Wood, extension to boundary base in Derby Street; Trustees of Queen Street Mission, for new shed at Canal Wharf; Messrs. Makin Bros., for eighteen houses in Penarth Road; Mr. William Makant, for smithy at Gilnow Bleachworks; Messrs. Wolfenden & Sons, for mill extension in Marsh Fold Lane; and Messrs. A. Bromley & Co., Ltd., for extension at Folds Mill, Folds Road.

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THE PRESENT POSITION OF THE SEWAGE DISPOSAL QUESTION.*

The issue of the Fifth Report of the Royal Commission on the treatment of sewage may be considered as a sign-post to mark the progress of the science and practice of sewage treatment. Of necessity such reports cannot be quite up to date, as the time required for their compilation and printing, &c., permits the march of progress to outstrip the labours of the workers and writers, whose published observations cannot keep pace with events, and it is not surprising, therefore, to find that even at the moment of issue the official report is "out of date." Perhaps nothing will illustrate this point better than the reference in the Fifth Report to the slate beds for the primary treatment of crude sewage. On page 67 of that report, dated August 7, 1908, these beds are referred to "more as preliminary settling or septic tanks than as contact beds," and the commission was unable to express an opinion as to the amount of digestion of sludge which takes place in them. As the beds had been at work for over three years, following eighteen months' preliminary trials, it is evident that the vast labours undertaken by the commission had not left them time to keep up to date, which is shown by the fact that in the following April, at the request of the Irish Local Government Board, the commissioners did make an investigation of these beds, and in contradistinction to the above observation as to the comparison with "settling or septic tanks," which, as everyone knows, produce most objectionable odours and foul-smelling sludge, Mr. Carter, one of the commissioners' chemists, reporting on the Devizes beds, referred, in his letter dated April 17, 1909, to the escaping humus as follows:—

"The muddy liquid is black in colour, and possesses a strong seaweed, but not offensive, odour."

"This sludge causes no nuisance during the process of drying, and when dry breaks up easily into a substance very like ordinary soil.

"On one occasion a bed was opened at the side down to the bottom for the purpose of examining the deposit on the slates. The deposit averaged about ½ inch; it was black and full of small red worms."

"No offensive odour could be detected in the bed, even when standing at the bottom of it on a hot day; in fact, it smelt exactly like a damp cellar."

These observations are distinctly different from the terms of the Fifth Report, and prove the absolute and entire reverse of the "settling or septic tanks" statement.

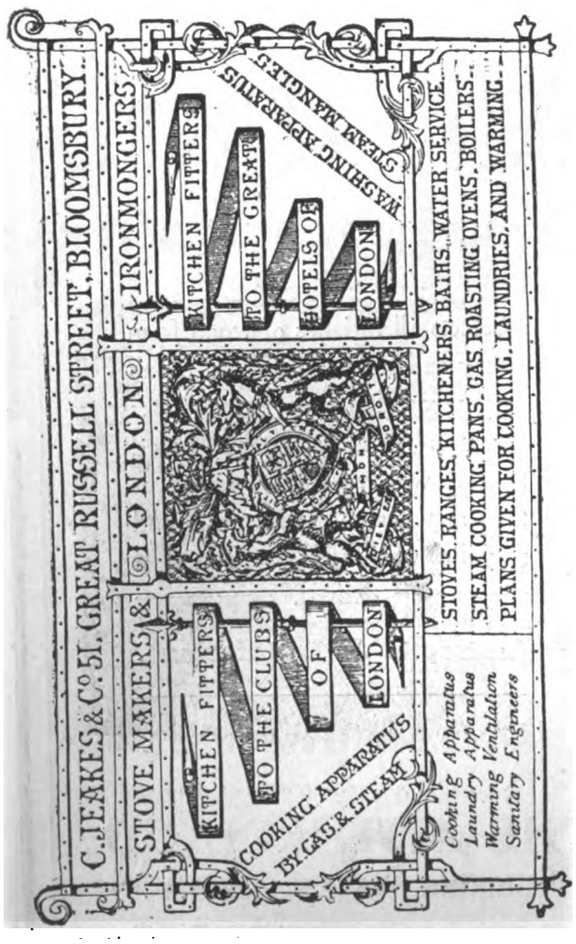
There are two points in the above statement which may be referred to—viz. (1) the use of the word "sludge," and (2) the average depths of the deposit on the slates was only "about ½ inch."

In the first it is to be noted that the word "sludge" in connection with sewage commonly denotes a foul-smelling, tenacious slurry, which will not dry readily, but ferments and produces a stench of far-reaching character, and it is this foul accumulation of abomination which is understood by the use of the word; and, moreover, it is the filthy character of the mass which causes all the difficulty in connection with sludge disposal, as no engineer would admit for a moment that he would have a difficulty in disposing of so many tons of "ordinary soil" which possesses no offensive odour. It is for this reason I have used the word "humus" instead of "sludge" to describe the worked-out residue which escapes from the slate beds when once the proper biological condition has been attained. A large proportion of this matter is formed of worm casts, indigestible *débris* and fine earthy matter, which "possesses a strong seaweed, but not offensive, odour." It is therefore clear that, on the showing of the most recent researches of the Royal Commission, the use of the word "sludge" in this connection is entirely wrong and misleading. In this connection the question may be asked:—"If we have 1 lb. of sewage organic solids and convert this into 1 lb. of living worms, &c., plus inert residue, have we purified those solids?"

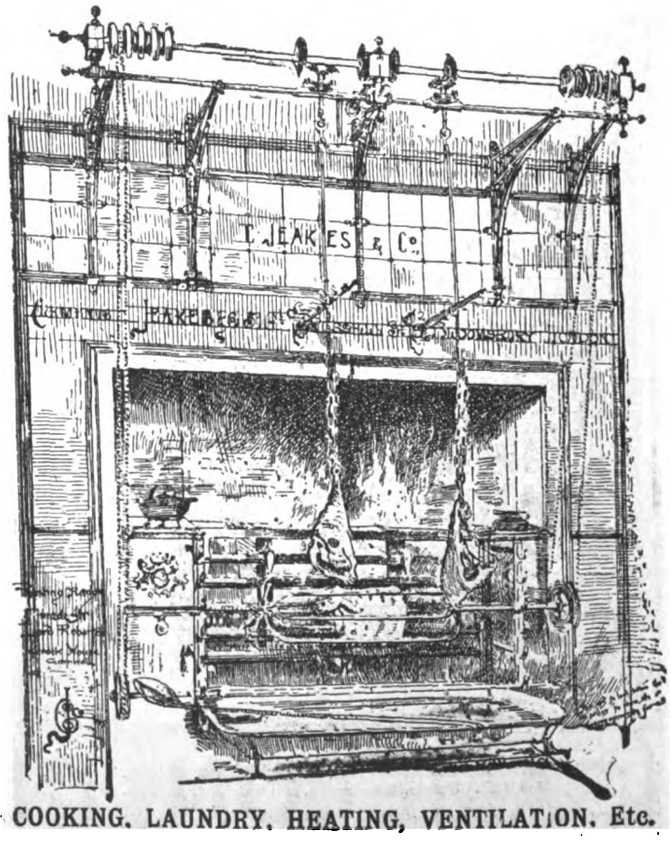
On the second point, as to the average depth of the deposit on the slates being only about "½ inch." The slates are laid about 2 inches apart. When examined by the Royal Commission they had been in constant use for over three and a half years, in which time the spaces between the slates had been filled up to only 25 per cent., and this fact throws considerable light upon the "amount of digestion of sludge which takes place."

As the whole of the air-dried "humus" or "ordinary soil," which has been produced by this process, was still on

* A paper read on October 6 before the Institute of Sanitary Engineers by Mr. W. J. Dibdin, F.I.C., F.C.S., &c.



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the works, practically none having been removed, the commissioners could easily ascertain the quantity, and as they are continuing their investigations we shall doubtless have an authoritative statement on this point in due course.

It is therefore perfectly clear on the facts, without calling in the supporting statements of numerous engineers, medical officers of health, chemists, &c., which I have in my possession, that the action of the slate beds is precisely similar to that of "contact beds," the only difference being in the physical arrangement of the supports for the living organisms which are the active agents; and that by their use the sludge difficulty, or in other words, nuisance, is absolutely overcome, without the cost of chemicals, sludge presses, or other expensive machinery.

This result was the point aimed at in the establishment of the slate beds, and was made clear from the first. Certain persons seemed to delight in trying to throw the onus of the cry "no sludge" on to the slate beds, but it is to be hoped that these efforts will cease, and more calm and truthful representations be adhered to for the future. "No offensive sludge" and "no sludge in the ordinary sense" are very different statements to "no sludge," and when read in connection with the accompanying clearly expressed enunciation of the biological process could by no possibility warrant the misrepresentations which have been made in connection with the slate beds.

On the other hand, we have recently had statements made to the effect that the slate beds sludge up.

If at Devizes there was an accumulation on the slates equal to only 25 per cent. of the water capacity, which accumulation does not increase, how can it be said that the beds "sludge up"? At other places, such as at Malden and High Wycombe, the time taken to fill the beds with sewage after some years of work is but some 10 per cent. longer than when they were new, which fact alone constitutes a perfect answer to such statements.

But even if in any reasonable time they did sludge up, what then? In the original design it was contemplated that provision must be made for such a contingency, and accordingly flushing shafts are provided at distances about 10 feet apart, and experiments have shown that a very moderate flush of water is sufficient to completely remove the whole of the deposit from the slates, leaving them perfectly clean, with the result that at a trifling cost for pumping effluent through a short length of hose the beds could be rapidly restored to a condition equal to new, as neither the slates nor the tank will be affected by the treatment. It will thus be seen that, whether the slate beds sludge up or not, they are equally permanent and remove the sludge "difficulty" for all time, as the biological process is not one of time, country, nor climate under all ordinary human conditions.

Having thus cleared the ground, necessarily at some length, to remove fallacies and misrepresentations, the details of the system may be more particularly referred to.

As is now well known, the "slate bed" is an improved form of contact bed, which is filled with superposed layers of slate separated at convenient distances, about 1 inch to 3 inches, as may be necessary, apart, by means of slate blocks, the whole thus forming an indestructible series of shelves, on which the sewage suspended matters are deposited when the beds are filled with sewage. As in the case of the old clinker coarse contact bed, the sewage is allowed to remain quiescent for two hours, when the outlet valve is opened and the "primary effluent" run off for further treatment on land, contact or sprinkler beds, &c., as the case may be, or for direct discharge into tidal estuaries, the sea, &c.

This short, condensed description postulates several points, viz.:—

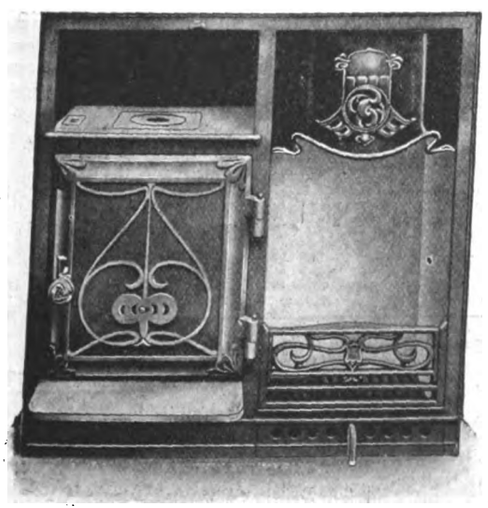
(1) Indestructibility of the slate "shelves." (2) Deposition of sewage suspended matters thereon. (3) Biological action on deposited matters. (4) Action taking place in respect to finely divided matters, colloids, &c., during the two hours' quiescence. (5) Necessity for secondary treatment of effluent. (6) Extent to which such secondary treatment should be carried under varying circumstances.

It will be convenient to deal with these in the order in which they arise:—

(1) *Indestructibility of Slate "Shelves."*—Slates kept wet do not become brittle, as they will when they are allowed to dry. They have lasted for geological periods under enormous pressure, and they may safely be relied upon to answer all human calls upon them for many lifetimes. The only way in which they can be injured in this connection is by improper arrangement of the layers and their supports. As the latter are simply square blocks of solid slate, they have

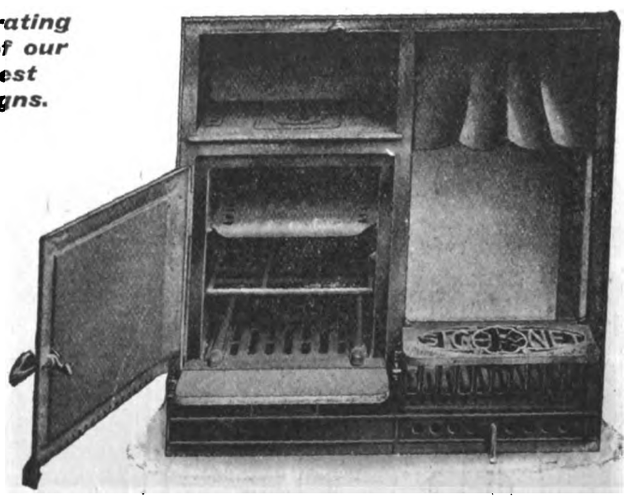
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an enormous strength, and when carefully arranged in columns of mutual support with a heavier layer, say, ½-inch slates, on the top, they will resist any reasonable call upon them. In fact, if necessary, no difficulty would be experienced in making the beds strong enough to carry a roadway.

Again, the beds cannot be destroyed by choking, as already shown, but even if they were intentionally choked they can be flushed clean again very rapidly and restored to a condition equal to new at a mere nominal cost.

(2) *The Deposition of Sewage Suspended Matters.*—This takes place during the period of quiescence, which follows the filling of the beds. Usually this is two hours, but under circumstances—say, to suit the exigencies of tidal flow, &c.—this time may be varied. Experiments made under my direction with the London sewage at Crossness, at the time I was preparing the scheme for the treatment of the London sewage, which scheme has now been at work for some nineteen years, showed that practically absolute deposition of suspended matters in a sewage treated with small quantities of lime and iron took place throughout a depth of 15 feet in forty minutes, the heavier matters settling down very rapidly. These results have been confirmed by many experimentalists since then. As the layers or "shelves" of slate are generally only 2 inches apart, it will be seen that the two hours allowed for quiescent settlement is far more than ample for perfect sedimentation.

Thus the beds in the first instance cannot be better described than in the words of my report to the London County Council, October, 1895, wherein I summarised the results of the work done since the Council gave their authority to the commencement of the work on March 10, 1891, in continuation of the chemical and biological investigations which had been conducted under the Metropolitan Board of Works from 1876, when Captain Calver made his celebrated report to the City of London on the condition of the River Thames, which report resulted in the big "Mud Inquiry," held by the arbitrators, Captain Douglas Galton and F. J. Bramwell, with Sir Charles F. Hartley as umpire, in 1879 and 1880, which was followed in 1882-3-4 by the Royal Commission, presided over by the late Lord Bramwell.

In my report above referred to I wrote as follows:—

"The action of a filter is two-fold: (1) it separates mechanically all gross particles of suspended matter and renders the effluent clear and bright. (2) It effects the oxidation of organic matters, both those in suspension and those in solution, through the agency of living organisms. It is the preliminary establishment and subsequent cultivation of these organisms which is to be aimed at in the scientific process of purification by filtration."

"The ordinary putrefactive and other similar organisms commence the work by breaking down the organic compounds and converting them to less complex forms, principally water, carbonic acid and ammonia; the nitrifying organism then acts upon the ammonia, the nitrogen being converted into nitric acid. For this process to go on, three conditions are essential. Firstly, the organisms must be supplied with plenty of air; secondly, there must be present a base, such as lime, with which the nitric acid can combine. . . .

"Filtration on biological lines of sewage and other foul water containing in solution but little free oxygen and a large quantity of oxidisable organic matter therefore means:—

"(1) That the filter, by cautious increments in the quantity of effluent, which in itself contains the necessary organisms, must be gradually brought to a state of high efficiency.

"This condition will be shown by the existence in the filtrate of a constantly increasing proportion of nitric acid.

"(2) That the contact of the micro-organisms with the effluent to be purified must be effected by leaving such effluent at rest in the filter for a greater or less time according to the degree of purification required, the process being analogous to that of fermentation. The system employed in many places is to run the water straight through the filter and thus allow insufficient time for the work, with the result that the effluent is soon in an unsatisfactory condition.

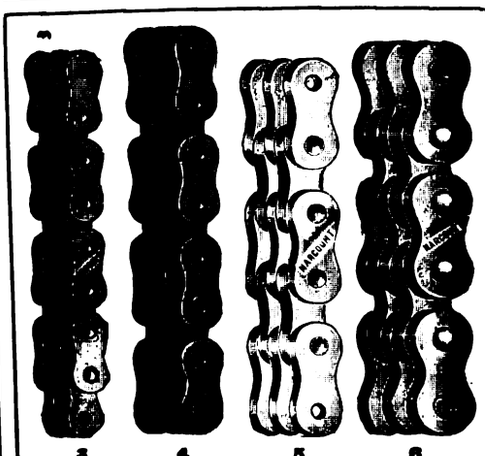
"(3) That after each quantity of effluent has been dealt with the micro-organisms must be supplied with air, which is readily effected by emptying the filter from below, whereby air is drawn into the interstices. The filter must stand empty for an hour or more previous to another filling."

(*To be concluded.*)

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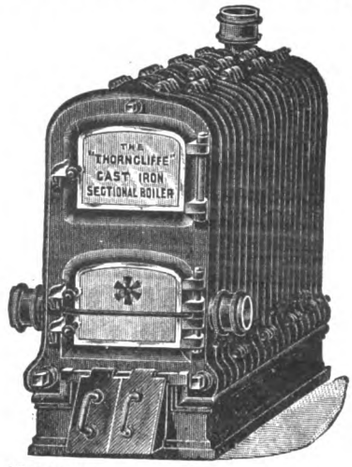
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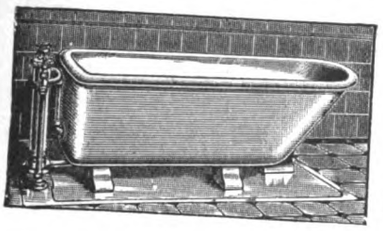
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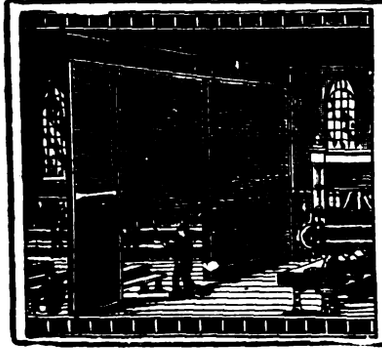
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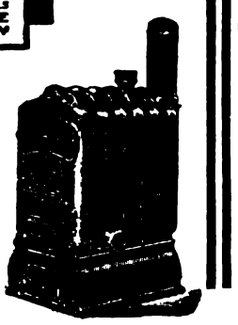
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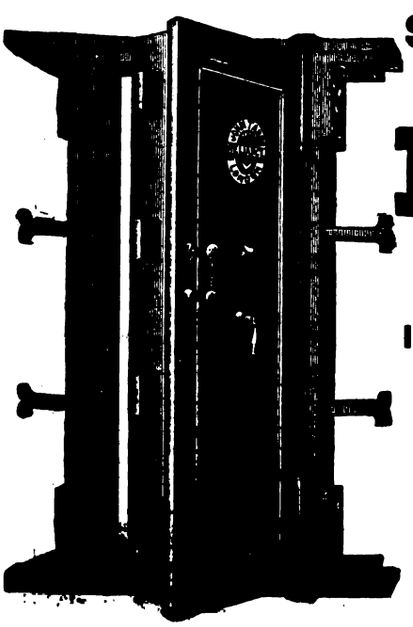
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Cathedrals and Abbeys of England—continued.

BRISTOL—*continued.*

Plan	October 6, 1899
East Side Cloisters	October 6, 1899
From Road looking South-East	October 6, 1899
Nave looking East	October 13, 1899
West Front	October 20, 1899
Detail of Front and West Door	October 20, 1899

WELLS.

Looking North-West from Wells	October 27, 1899
Choir looking East	October 27, 1899
North Porch and Tower	November 3, 1899
From Lady Chapel looking West	November 3, 1899
Looking North-East from Burial-ground	November 10, 1899
Details North Porch	November 10, 1899
Hugh Lugar's Chantry and South Aisle	November 17, 1899
The Triforium	November 24, 1899
The Lady Chapel	December 1, 1899
Bishop Bubwith's Chantry	December 8, 1899
Clock in North Transept	December 8, 1899
Steps to Chapter-house and Bridge	December 15, 1899
Tomb of Henry Husee, Dean 1302-05	December 15, 1899
Doorway, Chapter-house	December 22, 1899
View of Chapter-house, looking North-West	December 22, 1899
Section of Chapter-house	December 22, 1899
Bridge to Vicars Close	December 29, 1899

WESTMINSTER ABBEY.

Sixty Years Ago	January 5, 1900
Choir, looking East, Part North Transept	January 5, 1900
Entrance South Ambulatory	January 5, 1900
Triforium, North Transept	January 5, 1900
Tower and Buttresses from Cloisters	January 12, 1900
The Triforium	January 12, 1900
Choir looking East, Part South Transept	January 19, 1900
North Door	January 19, 1900
Transept looking North-East	January 26, 1900
Triforium, North Side of Sacrarium	January 26, 1900
Details North Porch	January 26, 1900
From South Transept looking North-East	February 2, 1900
North Ambulatory looking towards Henry VII.'s Chapel	February 2, 1900
Poets' Corner	February 2, 1900
Triforium, South Transept	February 9, 1900
North Side of Cloisters	February 9, 1900
Part Old Arcade, Chapel St. Edmund	February 9, 1900
Interior looking East Modern Screen	February 16, 1900
Details North Porch	February 16, 1900
South Ambulatory looking towards Henry VII.'s Chapel	February 23, 1900
North Ambulatory looking East	February 23, 1900
Abbot's Courtyard	February 23, 1900
Deanery and Corner of Cloisters	February 23, 1900
Bishop Islip's Chantry in North Ambulatory	March 2, 1900
Monks' Common Room	March 2, 1900
Crypt under Chapter-house	March 2, 1900
Chapel of St. Edmund, looking North-East	March 9, 1900
Entrance to Cloisters looking Dean's Yard	March 9, 1900
Tomb of Edward III.	March 9, 1900
Chapel St. John Baptist	March 16, 1900
View showing Porch	March 16, 1900
Bronze Gates	March 16, 1900
Cloisters and End South Transept	March 23, 1900
Entrance to Chapter-house	March 23, 1900
Shakespeare Memorial	March 23, 1900
Ambulatory to Henry VII.'s Chapel	March 30 1900
Doorway in Chapter-house	March 30, 1000
Arcade in Chapter-house	March 30, 1900
Chapel of St. Nicholas	April 6, 1900
Reredos from Confessor's Chapel	April 6, 1900
North Side, Confessor's Tomb	April 13, 1900
Abbot's Pew	April 13, 1900
North-East Side Confessor's Tomb	April 13, 1900
Chapel St. Edmund, looking North-West	April 20, 1900
Chapel of Pyx	April 20, 1900
Entrance to Little Cloister	April 20, 1900
Modern Reredos	April 27, 1900
Doors of Chamber of Pyx	April 27, 1900
Ancient Norman Capital	April 27, 1900
Tombs in Sacrarium	May 4, 1900
Gateway to Chapter-house	May 4, 1900
East Cloisters	May 4, 1900
Triforium, North Transept	May 11, 1900
End of Tomb of Henry VII.	May 11, 1900
Confessor's Shrine from North-West	May 11, 1900
Henry V.'s Chantry	May 18, 1900
Details	May 18, 1900
Tomb, Henry VII. and Queen Elizabeth	May 18, 1900
From Playground	May 25, 1900
Showing Tower and Roadway	May 25, 1900
Details of Stalls	June 1, 1900
Exterior	June 1, 1900
South Aisle	June 8, 1900
South Aisle looking West	June 8, 1900
Henry VII.'s Tomb	June 15, 1900
Henry VII.'s Tomb nd Chapel	June 15, 1900
Monuments of Duc de Montpensier	June 22, 1900
Showing Pendentive, &c.	June 22, 1900
Corner of Little Cloisters	June 29, 1900
Jerusalem Chamber	June 29, 1900
Figure, Mary Queen of Scots	June 29, 1900
Wilberforce Monument	June 29, 1900
Ground Plan	June 29, 1900

LICHFIELD.

Choir looking West	July 6, 1900
Nave looking East	July 13, 1900
West Doorway	July 20, 1900
View from West	August 10, 1900
West Front	August 17, 1900
Part Lady Chapel	August 24, 1900
South Door	August 31 1900
East End	August 31, 1900
North Transept Door	August 31, 1900
Portion of West Front	September 7, 1900
North Side of Nave	September 14, 1900
From Cathedral Close	September 21, 1900
Choir and Reredos	September 21, 1900
South Side of Nave and South Transept	September 21, 1900
Lady Chapel	September 28, 1900
From Minster Roof	October 5, 1900
South Choir Aisle	October 12, 1900
Showing Minstrel Gallery	October 19, 1900
Entrance to Chapter-house	November 2, 1900
The Reredos	November 30, 1900
The Transepts, looking North	December 7, 1900
North Nave Aisle, looking East	December 14, 1900
Detail of Corner of Front	December 14, 1900
One of the smaller West Doors	December 14, 1900
The Chapter-house Entrance	December 28, 1900
The Chapter-house Passage	December 28 1900
View in South Transept	December 28, 1900
Looking to Nave	December 28, 1900
Ground Plan	December 28, 1900

YORK.

General View of Exterior from South-East	January 4, 1901
General View from North-west	January 11, 1901
Detail of South-west end of Front	February 1, 1901
The Nave, to Organ Screen	February 8, 1901
View in North Transept, showing Clock and Triforium Windows	February 15, 1901
The Choir, half-length	February 22, 1901
From South-West	March 1, 1901
South Nave Aisle, looking East	March 8, 1901
South Choir Aisle, looking West	March 15, 1901
Entrance to the South Choir Aisle	March 22, 1901
The Choir to Organ Screen	March 29, 1901
The Great Stone Screen	April 5, 1901
View across Nave to North Transept	April 5, 1901
Detail of Nave Arches	April 12, 1901
Detail of Arcading under West Window	April 12, 1901
The Choir, full length to East Window	April 19, 1901
The Lady Chapel	April 26, 1901
Cross View to Nave from South Transept	May 3, 1901
View across Nave to South Transept, showing Font	May 10, 1901
The South Door	May 10, 1901
West End of Nave	May 17, 1901
West End of South Nave Aisle	May 31, 1901
South Choir Aisle, half length	June 7, 1901
The Chapter-house	June 21, 1901
The Chapter-house Door	June 28, 1901
Details in Chapter-house	June 28, 1901

CHICHESTER.

From St. Richard's Walk	July 5, 1901
The Screen and Choir	July 12, 1901
View from North-East	July 19, 1901
South Transept	July 26, 1901
Triforium, South-West Tower	August 2, 1901
Looking up the South-West Tower	August 2, 1901
Window Tracery, South Transept and Lady Chapel	August 9, 1901
Capitals, South Choir Aisle	August 16, 1901
Inside the Triforium looking West	August 23, 1901
South-West corner of Nave	August 30, 1901
East End of North Aisle	September 6, 1901
East Cloister and South Aisle	September 13, 1901
North Aisle, Looking West	September 20, 1901
Tower and South Transept	September 27, 1901
Ancient Sculpture in Wall of South Choir Aisle	October 4, 1901
The Raising of Lazarus	October 4, 1901
East End of Retro-Choir	October 18, 1901
The Lady Chapel	October 18, 1901
Cloisters and South-west Tower	October 18, 1901
Tower and East End of Choir	October 25, 1901
Triforium, North-east Corner of Retro-Choir	October 25, 1901
Chapel of St. Clement	November 1, 1901
Looking into South Aisle of Nave	November 1, 1901
One Bay of Nave Triforium	November 1, 1901
North Transep and Campanile	November 15, 1901
South Door in Cloisters	November 15, 1901
East End of South Cloister	Novenber 15, 1901
Triforium, &c., from West Window	November 22, 1901
West End of South Aisle	November 22, 19C1
The Reredos	November 29, 1901
The Library	November 29, 1901
East End of Lady Chapel	December 6, 1901
West End of Lady Chapel	December 6, 1901
The Nave	December 13, 1901
Nave Arches	December 13, 1901

RIPON.

General View of Exterior from South-East	January 3, 1902
The Choir to East Window	January 17, 1902
The Nave, looking West	January 31, 1902
General View, from the River	February 14, 1902
The Three Stone Sedilia	March 7, 1902
The Rood-Screen between Nave and Choir	March 28, 1902
The South Nave Aisle, looking East	April 4, 1902
The Choir, looking West	April 18, 1902

RIPON—*continued.*

View of the South Side of Nave	May 2, 1902
North Side of the Nave, showing Double Buttresses	May 2, 1902
General View of Nave to Organ Screen	May 16, 1902
Portion of North Transept, showing Old Stone Pulpit	June 6, 1902
The South Transept	June 6, 1902
The West Front	June 13, 1902
The West Entrance	June 13, 1902
South Choir Aisle, looking West	June 27, 1902

HEREFORD.

View from North-West	July 4, 1902
View from South-East	July 11, 1902
View from North-East	July 18, 1902
Nave Arches, North Side	July 25, 1902
South Aisle, looking East	August 1, 1902
From South Aisle, looking into North Transept	August 1, 1902
East End	August 8, 1902
South Side of Lady Chapel	August 8, 1902
North Porch	August 15, 1902
South Transept and Cloisters	August 15, 1902
The Nave	August 22, 1902
East End of South Choir Aisle	September 5, 1902
The High Altar	September 5, 1902
The Retro-Choir	September 19, 1902
In South-East Transept	September 19, 1902
The Choir Screen	October 10, 1902
From North Choir Aisle, looking South-East	October 17, 1902
The Cloisters and the Ladye Arbour	November 7, 1902
The Vicars' Cloisters	November 7, 1902
Looking into North Transept	November 14, 1902
East Wall of North Transept	November 21, 1902
The North Door	November 28, 1902
A Coffin Lid	November 28, 1902
East Wall of South Transept	December 5, 1902
Ball Flower Ornament on Tomb in North-East Transept	December 12, 1902
Four-Leaved Flower Ornament on Tomb in North noir Aisle	December 12, 1902
Corner of North Transept	December 19, 1902
Gargoyle in Cloisters	December 19, 1902
North Wall of Lady Chapel	December 26, 1902
Diaper Work and Capitals in North Transept	December 26, 1902

WORCESTER.

From North-East	January 2, 1903
The Choir, looking West	January 9, 1903
South Transept and Tower	January 16, 1903
Cloisters and Tower	January 23, 1903
The Nave	January 30, 1903
East End of Prince Arthur's Chantry. Details of Prince Arthur's Chantry	February 6, 1903
Looking North-West across the Nave	February 13, 1903
Entrance to Cloisters. Bosses in Cloister Vaulting	February 20, 1903
Capitals in South Transept. The Crypt	February 27, 1903
The High Altar	March 13, 1903
Nave Arches and North Transept	March 27, 1903
The West Door. The North Porch	April 10, 1903
From Lady Chapel, looking into South-East Transept	April 17. 1903
Chapel of St. John	May 1. 1903
Cloisters and South Transept	May 15, 1903
Looking into North Transept	May 29, 1903
South-East Transept	June 19, 1903
Looking into Lady Chapel	June 19, 1903
The Screen and Choir	June 19, 1903
North Cloister	June 26, 1903
The Chapter-House	June 26, 1903
South Door in Cloisters	June 26, 1903

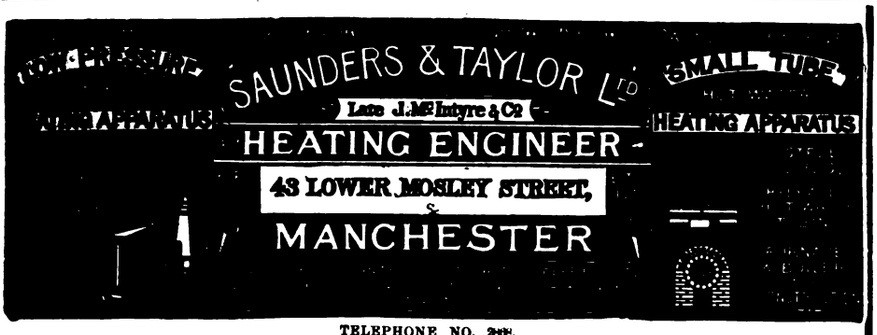
EXETER.

The West Front	July 3, 1903
The Choir, looking East	July 10, 1903
The Choir Screen	July 17, 1903
The North Tower and North Porch	July 24, 1903
The Nave, looking West	July 31, 1903
Window Tracery, North and South Side of Choir	August 7, 1903
View from South-East	August 14, 1903
Details of West Front	August 21, 1903
Chapter-house and Cloisters. South Tower, from Palace Garden	September 4, 1903
Sylke's Chantry and Chapel of St. Paul	September 11, 1903
West End of Lady Chapel	September 25, 1903
South Aisle, looking East	October 9, 1903
South Aisle	October 16, 1903
Nave Vaulting	October 23, 1903
Speke Chantry, and Chapel of St. Mary Magdalene	October 30, 1903
St. Gabriel's Chapel and End of Bishop Oldham's Chantry	November 6, 1903
North Transept and Clock	November 13, 1903
Nave, looking East	November 20, 1903
The Nave Arches	November 27, 1903
Chancel, and Screen to North Aisle	December 4, 1903
East End of Lady Chapel	December 11, 1903
The Choir	December 18, 1903
High Altar and Sedilia	December 25, 1903

CHESTER.

View from South-East	January 1, 1904
Tower, Flying Arches and Buttresses	January 15, 1904
Mosaics in Aisle	January 29, 1904
The Cloisters. Doorway in Cloisters	February 12, 1904

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Back Quad	April 30, 1909
Interior of Chapel	May 14, 1909
Interior of Library	May 14, 1909

HERTFORD.

The Exterior	June 11, 1909
Interior of Hall	June 11, 1909
The Quad	June 25, 1909
A Further View of Quad ...	June 25, 1909

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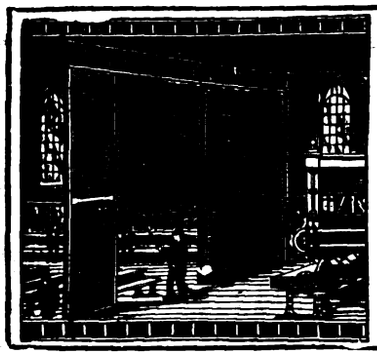
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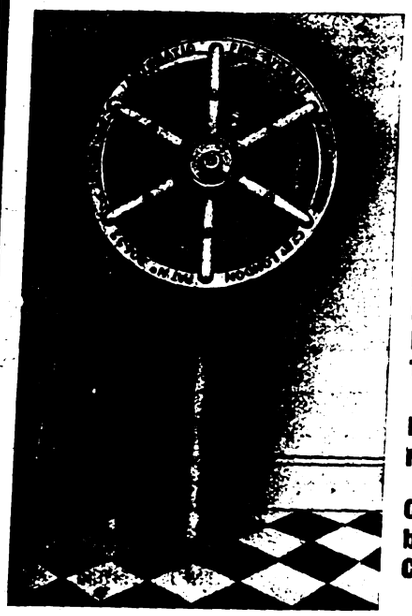
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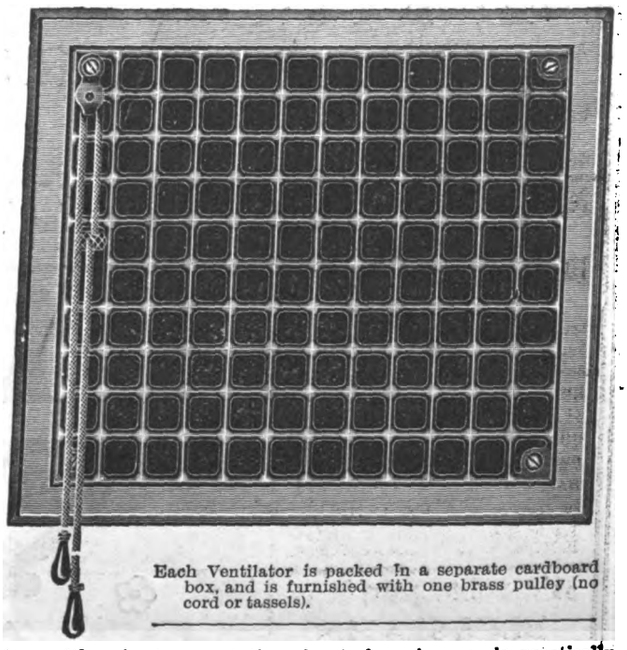
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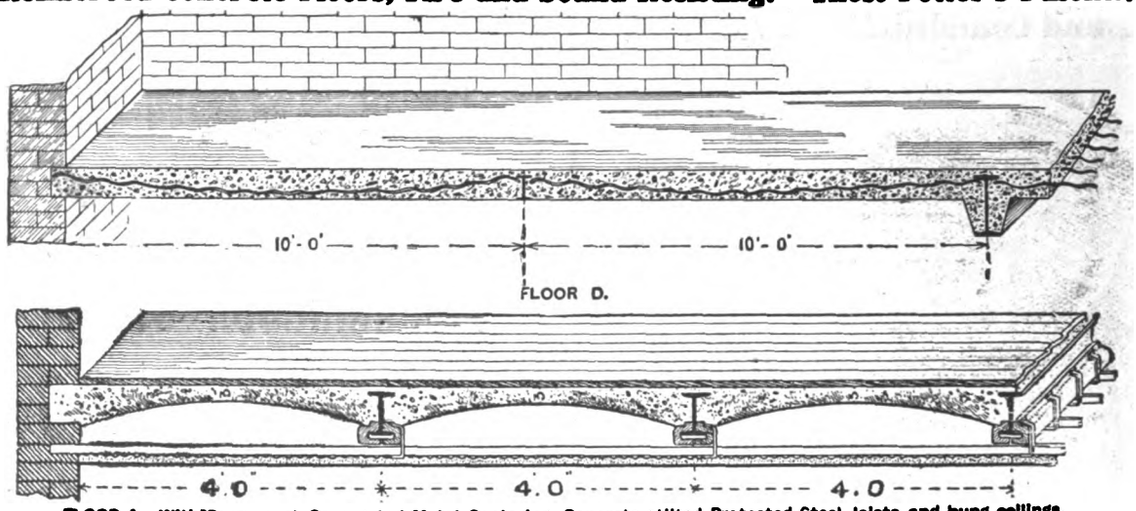
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Architect and Contract Reporter.

FRIDAY, OCT. 22, 1909.

Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s 6d. All business communications to the Managing Director,

P. A. GILBERT WOOD,

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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

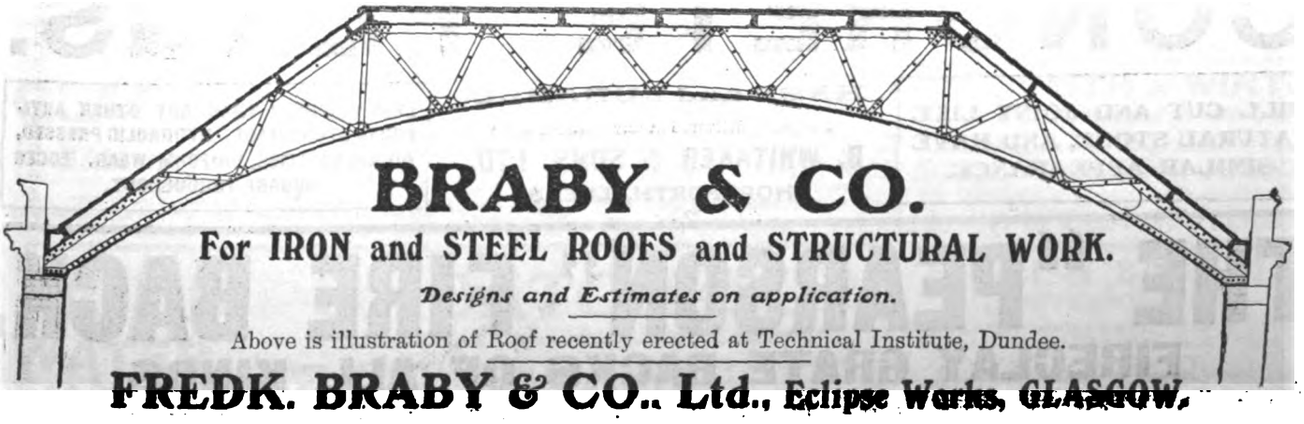
KENDAL.—Nov. 1.—The Corporation invite architects residing and practising in Westmorland to submit designs with description and estimate of a technical school. Premiums of 15*l.*, 10*l.*, and 5*l.* are offered.. The Borough Surveyor, Kendal.

LEEDS.—Dec. 18.—The education committee invite architects practising in Leeds to submit designs for proposed training college for teachers, Kirkstall Grange, Far Headingley. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist the committee. Deposit 2*l.* 2*s.* Mr. James Graham, Secretary for Education, Education Department, Leeds.

PRESTON.—Nov. 1.—The Corporation invite designs for a boys' grammar school. Premiums of 50*l.*, 30*l.* and 20*l.* Mr. Alfred Howarth, town clerk, Town Hall, Preston.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

WORKINGTON.—Nov. 30.—The Cumberland education committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the borough of Workington, Cumberland, for about 300 pupils of both sexes. Deposit 1*l.* 1*s.* Mr. C. Courtenay Hodgson, secretary, The Courts, Carlisle.



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CONTRACTS OPEN.

Bath.—Oct. 26.—For erection of ten or more dwellings for persons of the labouring classes, in Middle Lane, Dolemeads. Deposit 2*l.* 2*s.* The City Surveyor's Office, Guildhall, Bath.

Belfast.—Nov. 3.—For erection of two workmen's houses and a store and out-buildings at the works at Oldpark. Mr. R. Hamilton, secretary, Water Office, Belfast.

Bentley-with-Arksey.—Nov. 5.—The West Riding education committee invite whole or separate tenders for the following work, viz.:—Bentley-with-Arksey, new school (builder, joiner, tiler, plasterer, plumber, painter). Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

Bodmin.—Oct. 28.—For erection of proposed East Cornwall Hospital in Rhind Street. Mr. Morley B. Collins, architect, Clinton Road, Redruth.

Bournemouth.—Nov. 5.—The Town Council invite schemes and tenders for the construction of six cells, as additions to their existing destructor. Deposit 5*l.* 5*s.* Mr. F. W. Lacey, M.I.C.E., borough engineer, Municipal Buildings, Bournemouth.

Bradford.—Oct. 28.—For the various works (painters' excepted) required in erection of stabling for sixteen horses off Wakefield Road, for the City of Bradford Co-operative Society, Ltd. Mr. William Rycroft, architect, Bank Buildings, Manchester Road, Bradford.

Brampton.—Oct. 27.—For the erection of a wood ceiling and ventilator in the Primitive Methodist Church. Mr. J. G. Atkinson, The Sands, Brampton, Cumberland.

Brixham (Devon).—Oct. 27.—For additions and alterations to the town hall. Deposit 1*l.* 1*s.* Mr. Fred. Wm. Vanstone, C.E., Palace Chambers, Paignton.

Darlington.—Oct. 25.—For erection of a central school for domestic subjects, in Beaumont Street. Deposit 2*l.* 2*s.* Mr. George Winter, borough surveyor, Town Hall, Darlington.

Elland.—Oct. 26.—For the various trades required in the erection of a secondary school, Victoria Road, Elland, Yorks. Send names to Mr. W. S. Braithwaite, architect, 6 South Parade, Leeds.

Farnworth.—Oct. 27.—For erection of a Carnegie library in Market Street. Deposit 5*l.* Mr. Walter J. Lomax, architect, 11 Fold Street, Bolton.

Halifax.—Oct. 29.—For the erection of sanitary tower and fittings, and also alterations to existing conveniences at Battinson Road Mill. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

Hertford.—Oct. 29.—For building two new bath-rooms at the Hertford Union workhouse. The Master of the Workhouse, Hertford.

Ireland.—Oct. 27.—For reconstructing premises in Scotch Street, Armagh. Mr. Sampson Jervois, M.R.I.A.I., architect, Armagh.

Ireland.—Nov. 1.—For the erection of Central Technical Institute, Military Road, Limerick. Deposit 1*l.* Mr. James MacKay, quantity surveyor, 58 Dame Street, Dublin, and 82 South Mall, Cork.

Keswick.—Oct. 25.—For erection of two dwelling-houses at Greta Side. Messrs. Banks & Co., Pencil Works, Keswick.

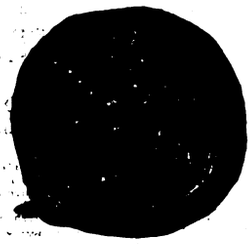
Leeds.—Oct. 29.—For the whole of the work required in the alterations, &c., of shop premises into lodging-house for women, Nos. 52-54, Lady Lane. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

London.—Nov. 17.—For the construction of a store building and other contingent works on land at the Battersea works of the Board, for the Metropolitan Water Board. Chief Engineer, Savoy Court, Strand, W.C. Deposit 10*l.* with the Accountant at Savoy Court, Strand, W.C.

Manchester.—Oct. 26.—For the construction of retaining walls at Central Avenue, Harpurhey. Deposit 2*l.* 2*s.* The City Surveyor's Office, Town Hall, Manchester.

Morecambe.—Oct. 28.—The Corporation invite designs and tenders from firms specialising in bandstands and shelters for supply and erection of two bandstands and four shelters. Mr. J. W. Hipwood, A.M.I.C.E., borough surveyor, Morecambe.

Moreton.—Oct. 23.—For building a new class-room at the elementary school. Messrs. Charles & W. H. Pertwee, architects, Chelmsford.



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Nottingham.—Oct. 26.—For additions to the City Asylum, Mapperley Hill. Deposit 2*l.* 2*s.* Mr. Frank B. Lewis, city architect, Guildhall.

Old Hill.—Oct. 25.—For erection of a house for a fire engine and a tower for hose-drying at Halesowen Road. Mr. Daniel Wright, clerk, Council Offices, Old Hill, Staffordshire.

Prawle.—Oct. 23.—For the restoration of the barn, &c., at the Higher Farm, East Prawle, near Kingsbridge. Messrs. White & Colley, land agents and surveyors, Avonwick, South Brent.

Scotland.—Oct. 25.—For the mason, carpenter, plumber, plaster, slater, and painter and glazier work required in rebuilding Market Place school, Inverurie. Mr. Geo. Gray, architect, Inverurie.

Scotland.—Oct. 27.—For the mason, joiner, plumber, slater, plaster, and tile works in connection with the erection of new premises, 125 High Street, Dunfermline. Mr. T. Hyslop Ure, architect and surveyor, 43 Carnegie Street, Dunfermline.

Shirebrook.—Nov. 6.—For proposed Council school for girls at Shirebrook, Derbyshire, to accommodate about 320 girls, with cookery room in addition. Deposit 1*l.* 1*s.* Mr. George H. Widdows, A.R.I.B.A., architect, County Education Office, St. Mary's Gate, Derby.

Shoreham.—Nov. 5.—For the erection of a rocket life-saving apparatus house at Shoreham, Sussex, for the Board of Trade. The Coastguard Station, Shoreham.

South Brent.—Oct. 28.—For building enclosure wall and erecting lych gate for the Church burial ground. Mr. R. Hansford Worth, M.I.C.E., 42 George Street, Plymouth.

Sowerby Bridge.—Oct. 26.—For the supply and erection of a refuse destructor. Deposit 2*l.* 2*s.* Mr. George E. Wrigley, Engineer's Office, Sowerby Bridge.

Swinton.—Oct. 31.—For the erection of a new school to accommodate 1,250 scholars. Send names by above date to Mr. W. T. Postlethwaite, Council Offices, Swinton, Manchester.

Wales.—Oct. 26.—For restoring the premises 40 Queen Street, Cardiff, after fire. Mr. John W. Rodger, architect, 14 High Street, Cardiff.

Wales.—Oct. 28.—For erection of Siloh Congregational Chapel, Pontardulais. Deposit 1*l.* Mr. D. L. Jones, architect, 40 Thomas Street, Llanelly.

Wales.—Oct. 25.—For additions and alterations to Cwmbran Police Station and Court, Mon. Deposit 1*l.* 1*s.* Mr. William Tanner, F.S.I., county surveyor, Newport.

Wales.—Oct. 27.—For the following works, for the Glamorgan County Council, viz.:—(1) Alterations to the master's house at the Council school at Bedlinog; (2) new offices at the Council school at Pontardulais; (3) new offices, &c., at the county school at Bridgend. The County Council Offices.

Wales.—Oct. 29.—For erection of a county hall in the Cathays Park, Cardiff, upon foundations which have already been laid, for the Glamorgan County Council. Deposit 2*l.* 2*s.* Messrs. Harris & Moodie, architects, 8 New Square, Lincoln's Inn, London, W.C., or at the County Council Offices, Cardiff.

Wales.—Nov. 6.—For the following work for the Swansea Guardians, viz.:—(1) Erection and completion of a male imbecile day room at the Union workhouse; (2) provision of lavatory accommodation at the Union Offices, Alexandra Road. Deposit 2*l.* 2*s.* Mr. Charles T. Ruthen, architect, Bank Chambers, Heathfield Street, Swansea.

Wales.—Nov. 9.—For erection of twenty-four or more dwelling-houses, with roads, sewers, &c., at Aberfan, for the Pleasant View Building Club. Mr. O. P. Bevan, architect, Express Chambers, Merthyr Tydfil.

Wales.—Nov. 11.—For erection of twenty-four or more dwelling-houses, together with the construction of roads, sewers, &c., at Aberfan, for the Pleasant View Building Club. Mr. O. P. Bevan, architect and surveyor, Express Chambers, Merthyr Tydfil.

Walkden (Lancs.).—Nov. 6.—For erection of a technical school at Walkden, for the Worsley Urban District Council. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Whittington.—Oct. 26.—For the enlargement and improvement of Whittington Council school, near Lichfield (new class-room for sixty children, cloak-room, heating chamber, &c.). Deposit 10*s.* 6*d.* Apply to Mr. Graham-

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Balfour, director of education, County Education Offices, Stafford.

Widnes.—Nov. 13.—For the enlargement and extension of the Widnes Municipal secondary and technical school. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

York.—Oct. 27.—For the raising of the archway through the city wall at Leeman Road. Deposit 1*l.* 1*s.* Mr. F. W. Spurr, city engineer, Guildhall, York.

Concrete and Constructional Engineering, in its October issue, devotes a considerable amount of space to the proceedings of the various associations which held their meetings at Copenhagen during September, and which dealt particularly with questions of concrete, reinforced concrete and Portland cement. A most interesting article is published on reinforced concrete in Denmark, illustrating a number of important works executed in that country, and among these illustrations is one showing the launching of reinforced concrete caissons for harbour work in Jutland. Another well illustrated article is devoted to reinforced concrete bridges, chiefly in France. The report of the U.S.A. Joint Committee on Reinforced Concrete also makes interesting reading. As usual, a number of new works in concrete are described and illustrated, as also new applications of that material.

A meeting of municipal engineers held recently at Westminster decided to submit to the War Office and the Board of Agriculture a scheme for the employment of surveyors and municipal engineers in national defence, and a body has been formed to be known as the Municipal Engineers' Imperial Defence Committee. The object of the committee is "the organisation, in connection with the defence of the British Empire, of the members of the municipal engineering and kindred professions and their mechanics and skilled labourers." The committee think that in the event of an invasion a corps of municipal engineers would be of the highest value to the Territorial Force. It is estimated that the strength of the corps would be approximately 2,000 technical officers and 25,000 mechanics and skilled labourers.

TENDERS.

ANNFIELD PLAIN.

For building a United Methodist church. Mr. Kell, architect, Chester-le-Street.

	Mr. A.	T.	B.
Auld	£1,511	0	0
Walker	1,461	0	0
D. & J. Rankin	1,370	0	0
Morley	1,341	8	7
Dyson	1,320	0	0
Middlemiss Bros.	1,285	0	0
Fenwick & Co.	1,283	0	0
White	1,275	0	0
Southren	1,273	0	0
Reynoldson & Son, Dipton (*recommended*)	1,236	0	0

BURSLEM.

For extensions at the electricity works.

Accepted tenders.

Bellis-Siemens, generator set	£2,922	0	0
Storey, condenser	1,600	0	0
Grant, buildings	1,400	0	0
Babcock & Wilcox, boiler	1,110	0	0
Babcock & Wilcox, pipework	108	0	0
Crompton & Co., switch gear	100	0	0

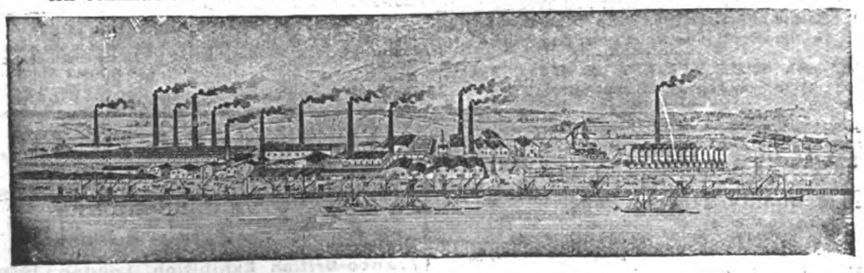
BURY ST. EDMUNDS.

For alterations to the Town Hall. Mr. Sydney Naish, architect, Bury St. Edmunds.

Bell & Sons	£1,664	0	0
Kenny	1,593	0	0
Spencer, Santo & Co.	1,508	0	0
Ambrose	1,497	18	1
Frost	1,470	4	3
Warren	1,411	15	5
Hinnels & Son	1,393	9	8
Parkington & Son	1,339	0	0
Linzell	1,328	6	10
Grimwood & Sons	1,314	0	0
Mason & Son	1,291	10	0
Hinkins & Sons	1,247	0	0

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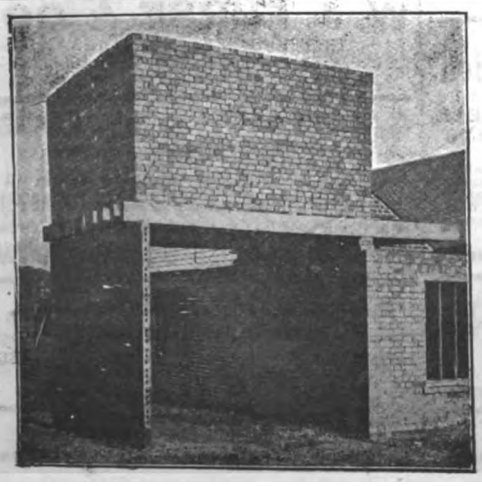
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BURY ST. EDMUNDS—*continued.*

For preparing site, building foundations, laying drains, &c., for sanatorium. Mr. Walter D. Harding, A.M.I.C.E., borough surveyor, Bury St. Edmunds.

Bennett	£289 0 0
Linzell	257 0 0
Mason & Son	255 0 0
Spencer, Santo & Co., Felixstowe (*accepted*)	250 0 0
Wilson & Co.	249 10 3

CUXTON.

For erecting a cattle-cake mill at Cuxton, near Rochester. Messrs. Ruck & Smith, architects, Maidstone.

Burrows	£7,275 0 0
Burr	6,156 14 8
Ellingham	5,297 0 0
Cox Bros.	5,260 0 0
Corben & Co.	5,245 0 0
Barden & Head	5,240 0 0
Dixon	5,214 10 0
Kemp Bros.	5,173 0 0
Phillips	5,130 0 0
Baker & Son	5,043 0 0
Wilford	5,015 10 0
Elmore & Son	5,015 0 0
Davison	5,010 0 0
Gates & Son	4,998 0 0
Clarke & Epps	4,989 0 0
Skinner	4,946 0 0
West Bros.	4,933 0 0
Smith & Sons	4,758 0 0
Wallis & Sons, Maidstone (*accepted*)	4,750 0 0

DURHAM.

For the construction of the Ludworth sewers, for the Rural District Council.

Johnson & Langley	£297 1 7
Sowerby	295 0 0
Carrick	245 0 0
Reavell	243 0 11
Oliver	222 7 6
Henderson, Gosforth (*accepted*)	192 2 6

EAST KIRKBY.

For branch stores, Diamond Avenue. Mr. Walter H. Woods, architect, &c., Long Eaton.

Beckett	£710 0 0
Bains	706 0 0
Hoole	675 0 0
Stubbings & Fell	670 0 0
Auld	641 0 0
Tate & Son, Annesley Woodhouse (*accepted*)	640 0 0
Greenwood	637 0 0

HAILSHAM (SUSSEX).

For the erection of a detached house at Magham Down, for W. M. Bear, Esq. Mr. Arthur H. Burtenshaw, P.A.S.I., architect, Eastbourne.

Morris	£334 15 0
Collins	320 0 0
Stevens	309 0 0
Rich	305 0 0
Phillips (*accepted*)	299 10 0

For the erection of pair of cottages in Battle Road, for W. Burtenshaw, Esq. Mr. Arthur H. Burtenshaw, P.A.S.I., architect, Eastbourne.

Collins	£450 0 0
Rich (*accepted*)	435 0 0

LONDON.

For the erection of shops with flats above upon the site of 118 Draycott Avenue and 119 to 121 Walton Street, Fulham Road, S.W. Messrs. Joseph & Smithem, architects, 83 Queen Street, E.C.

Ashby & Horner	£2,595 0 0
Holloway Bros.	2,590 0 0
Carmichael	2,494 0 0
Minter	2,470 0 0
Higgs & Hill	2,424 0 0
Bovis & Co.	2,399 0 0
Holliday & Greenwood	2,388 0 0
Wallis & Sons	2,337 0 0
Lawrence	2,332 0 0
Lenn & Co. (*accepted*)	2,305 0 0



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LONDON—*continued.*

For (1) the erection in connection with the Duncombe Road school, Islington, N., of a domestic economy centre on the site of No. 43 Nicholay Road; (2) the conversion of the existing manual training centre into a cookery centre for fifteen girls and a laundry centre for fourteen girls; and (3) the conversion of the existing laundry centre and covered playground into a manual training centre for forty boys.

Treasure & Son	£1,885 0 0
J. & M. Patrick	1,873 0 0
Brand, Pettit & Co.	1,870 0 0
Godson & Sons	1,840 0 0
McLaughlin & Harvey	1,836 0 0
Williams & Sons	1,828 0 0
Grover & Son	1,827 0 0
Roberts & Co.	1,816 0 0
McCormick & Sons	1,688 0 0
Stevens & Sons	1,676 0 0
Neal	1,565 0 0
Stewart, Tottenham (*recommended*)	1,391 5 0
Estimate of the architect (Education)	1,400 0 0

For carrying out certain alterations and additions at Swan Wharf, Putney Bridge, for the Fulham Borough Council.

Clifton	£409 0 0
Matthews	308 0 0
W. R. & A. Hide	256 0 0
Lawrence	255 0 0
Stone	253 7 6
Heath	245 0 0
Brooks & Co.	233 0 0
Lusher & Sprange	225 0 0
Jarman & Co.	220 0 0
Harwood & Co.	217 0 0
Eyles	207 0 0
Hough	207 0 0
Wood Bros.	189 17 6
Harris	159 0 0
Moseley	139 0 0
Borough Surveyor's estimate	185 0 0

LONDON—*continued.*

For rebuilding retaining wall, Brookbank Road, for the Lewisham Borough Council.

Woodham & Sons	£305 0 0
Fry Bros.	296 0 0
Pearce (*recommended for acceptance*)	267 0 0

For the supply of a condensing plant for the Paddington Technical Institute, for the London County Council.

Clarke, Chapman & Co.	£439 0 0
Carruthers & Co.	270 0 0
Storey & Sons, Manchester (*recommended*)	216 0 0

MANSFIELD WOODHOUSE (NOTTS).

For private street works. Mr. F. P. Cook, A.M.I.C.E., surveyor.

Green's Sons	£4,926 3 11
Palmer	4,446 14 5
Lane Bros.	3,816 5 5
A. & C. Raynor	3,682 14 7
Bradley (*accepted*)	3,482 15 8

MILTON.

For erection of a house and buildings at Milton, Cambridgeshire. Mr. H. H. Dunn, county architect, Cambridge.

Ambrose	£545 10 0
Willmott & Sons	510 0 0
Pamphilon & Son	505 0 0
Rooke & Sons	504 2 2
Parren & Sons	492 0 0
Brignell	475 0 0
Clark & Sons	470 0 0
Kidman	454 0 0
Scott	444 5 5
Gim, Chesterton (*accepted*)	412 0 0

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NORTHAMPTON.

For the erection of premises in Abingdon Street, for the Co-operative Society. Mr. A. E. Anderson, architect, Northampton.

Cosford	£3,301 0 0
H. Green	3,294 0 0
Hawtin	3,290 0 0
Dunham	3,265 0 0
Heap	3,237 0 0
Martin	3,232 0 0
Archer	3,228 0 0
Sharman	3,198 0 0
Chown	3,185 0 0
Higgs	3,078 0 0
E. Green, Northampton (*accepted*)	3,044 0 0

NORWICH.

For erection of factory. Messrs. Morgan & Buckingham, architects, &c., Norwich.

Gill & Son	£2,433 0 0
Podd & Fisher	2,358 0 0
Hawes & Sons	2,345 0 0
Youngs & Son	2,277 0 0
Searles Bros.	2,270 0 0
Yelf	2,175 0 0
Anderson & Sons	2,140 0 0
Hannant, Norwich (*accepted*)	2,137 0 0

For alterations and additions to premises, Haymarket. Messrs. Morgan & Buckingham, architects, &c., Norwich.

Holmes	£729 0 0
Hannant	687 0 0
Gill & Sons	668 0 0
Youngs & Son	624 0 0
Hawes & Sons, Norwich (*accepted*)	594 0 0

For heating and hot-water supply to new infirmary, Bowthorpe Road. Messrs. Morgan & Buckingham, architects, &c., Norwich.

Brightside Foundry and Engineering Co., Sheffield (*accepted*)	639 0 0

RATHDOWN (IRELAND).

For drainage works at Dundrum, for the Rathdown Rural District Council.

Clarke	£13,532 16 7
Burns	13,499 4 1
Martin & Co.	13,492 19 4
Fleming Bros.	12,713 16 11
H. & J. Martin	12,705 0 0
Fitzpatrick	11,950 18 2

READING.

For alterations to the board room and offices for the Guardians.

Bell & Sons	£1,394 0 0
Lewis & Bro.	1,215 0 0
Curtis	1,193 0 0
Godwin	1,154 0 0
Sutton	1,109 11 6
Fitt, Reading (*accepted*)	972 0 0

SOLIHULL.

For the construction of new roadways, pathways, &c., at the Solihull Workhouse. Messrs. W. H. Ward, architects, Paradise Street, Birmingham.

Allsopp	£541 0 0
Wood	500 0 0
Trentham	493 0 0
Hunt (John) & Sons	472 0 0
Currall & Lewis	425 0 0
Thorpe	398 0 0
Mason, Birmingham and Stourbridge (*accepted*)	360 18 6

Two other tenders sent in too late for consideration by committee.

TAUNTON.

For new vestry at the church of St. Mary Magdalene. Messrs. Naylor & Sale, FF.R.I.B.A., Derby; and Messrs. Sprankling & Price, Taunton, architects.

Pollard & Co.	£2,120 0 0
Small	1,970 0 0
Spiller & Son	1,810 0 0
Spiller, Taunton (*accepted*)	1,695 10 0
Moygridge & Son	1,695 0 0
Coles	1,660 0 0

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MARBLE—Anglo-Sth. American Bank, Old Broad Street, E.C. New Admiralty Buildings, Whitehall, S.W. North British & Mercantile Offices, Waterloo Place, S.W.
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WALES.

For erecting a hall adjoining the Trinity Presbyterian Church, Acrefair, near Ruabon. Messrs. Lewis-Dickens & Haymes, architects, Shrewsbury.

Roberts	£2,257	0	0
Nicholas	1,987	0	0
Carden	1,987	0	0
Bickerton	1,970	0	0
I. Jones	1,966	0	0
J. T. Jones	1,965	0	0
Jenkins	1,953	0	0
Humphreys	1,950	0	0
Hayes, Shrewsbury (*accepted*)	1,790	0	0

For erection of the Carreghofa new Council school, Newtown, Montgomery.

Felton	£1,950	0	0
Turnbull	1,796	0	0
Davies	1,758	0	0
Wall & Beckitt	1,730	0	0
Thomas	1,482	12	7
Meredith	1,380	0	0
Jones	1,367	19	0
Griffiths & Sons, Ellesmere (*accepted*)	1,200	0	0

For works of improvement and alterations to the Cwmdu Council school, and for a proposed new water supply, Newtown, Montgomeryshire.

Dean & Co.	£441	0	0
Roberts	383	6	0
I. Jones	372	0	0
R. A. Jones, Llanfyllin (*accepted*)	256	14	0

WINCHESTER.

For erecting the central hall, &c., Peter Symonds's School. Messrs. Cancellor & Hill, architects, 12 Jewry Street, Winchester.

Billett & Musselwhite	£1,349	0	0
Goodhall & Son	1,333	10	0
Grace & Sons	1,302	0	0
Coston & Co.	1,224	0	0
Harris Bros., Salisbury (*accepted*)	1,205	0	0

TRADE NOTES.

A quantity of ventilators of entirely new design are being fixed on the new General Post Office, King Edward's Buildings, London, made by Kershaw, Brassington & Co. (Arnold W. Kershaw & Co.), Lancaster and Settle.

New quarter chimes have been fitted to the clock of Buckminster parish church, near Grantham. The work has been carried out by Messrs. John Smith & Sons, Midland Clock Works, Derby, who have also lately received an order from Sir William Hartley for a large clock for Colne, Lancashire.

Mr. F. H. Tulloch held an enquiry last week at Birmingham into the application for sanction to borrow 121,217*l.* for the extension of the Council House. The Town Clerk explained that the application was for a second instalment of a total application for permission to borrow 150,000*l.*, the estimated cost of extending the Council House and providing accommodation for an art gallery. The amount was already covered by contracts entered into. They had already entered into a contract for heating and ventilating amounting to 5,878*l.*, and a further contract for the remainder of the building amounting to 128,744*l.* The principal items of the 128,000*l.* were:—Bricklayer, 14,088*l.*; mason, 38,291*l.*; joiner and ironmonger, 18,703*l.*; founder and smith (including steel work, 10,000*l.*), 17,494*l.*; and the plasterer, 16,309*l.*

The foundation stone has been formally laid of the new church of St. Oswin, which is being erected at Brinkburn, Stanhope Road, South Shields. The new church will displace the small corrugated iron erection in Oxford Street. At present three bays of the nave are being built, at a cost of 3,300*l.*, and this will afford accommodation for 300 people. The church in its complete state will accommodate over 600 worshippers, and is planned on the hall type, the whole of the seating being provided in the nave, the north and south aisles only serving as passage ways. Provision is also made for vestries, organ chamber, &c. The building is designed in Late Decorated style of Gothic architecture, and is being faced with "Pelaw" bricks, with stone freely introduced as dressings. Mr. James Young, of Tyne Dock, is the contractor, and Mr. Henry Grieves, A.R.I.B.A., of South Shields, is the architect.

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Municipal Buildings, Crewe. Columns and Pilasters. Henry T. Hare, Esq., F.R.I.B.A.
King's Theatre, Southsea. Proscenium Border, Piers, Architraves, &c. Messrs. F. Matcham & Co.
9 Great St. Helen's, E.C. Wall-lining, Dado, &c. Messrs. Ellwood & Sledmere.
Waldorf Hotel. Columns and Pilasters. Messrs. A. Marshall Mackenzie, F.R.I.B.A., & Son.
Central Library, Islington. Columns. Henry T. Hare, Esq., F.R.I.B.A.
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LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.—DESIGN FOR ART GALLERY.

BUILDING AND BUILDERS.

THE Glasgow Corporation at their last meeting formally approved the draft by-laws prepared under the Glasgow Building Regulations Act, 1900.

THE Sheffield Master Builders' Association are supporting the candidature of Mr. J. Kaye, builder and contractor, for the Crookesmoor Ward. The Association is not at present represented on the City Council.

AFTER being defeated at the previous meeting, the resolution to obtain the necessary loan of 3,225*l.* for the erection of the dust destructor at Dorking was passed by the Dorking Urban Council last week. The work had already begun.

NEGOTIATIONS are in progress, it is believed, between the Thames Conservancy and the University of Oxford for the purchase by the former of Ray Mill Island, adjoining Boulter's Lock and Cut, with a view to constructing a new lock, lock-keeper's house, lavatory accommodation, &c.

THE Matlock Bath Urban Council have received the consent of the Local Government Board to the erection of a kursaal and pump-room to complete the improvement scheme which is costing the town 50,000*l.* The building will now be commenced on the site by the Fishpond, where about 10,000*l.* will be expended during the winter.

THE Basingstoke borough surveyor has been instructed to report on the advisability of erecting a new dust destructor, as to the site of the present destructor, and also as to the estimated cost, &c. The borough surveyor was instructed to prepare plans, specifications, &c., for making good Coronation Road so far as it is within the borough.

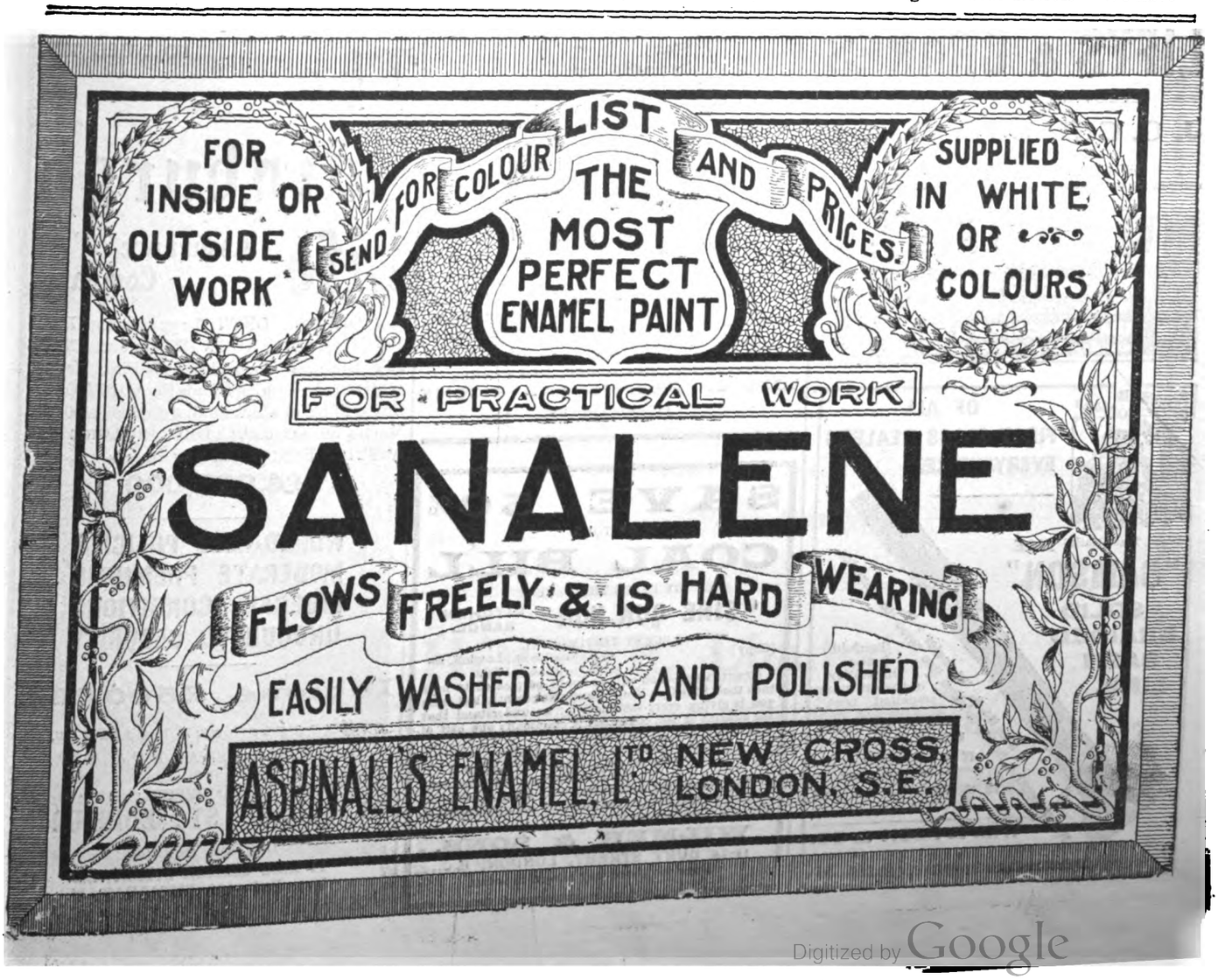
THE Margate Town Council last week adopted the proposal of the works committee for a lower promenade at an estimated cost of 10,895*l.*, but that for widening the upper promenade at the Front was deleted. The Council approved of the plan of obtaining the material for filling in behind the sea wall by excavating a bathing pool on the rocks in front of the promenade at an estimated cost of 11,000*l.*

THE Durham Rural District Council last week passed the following plans:—Stable and coach-house at Auton Stile, for Dr. J. Brown; stable at Ushaw Moor, for Wm. Milburn; house and shop at Blackgate, Coxhoe, for W. E. Robson; alterations to Cross Keys Inn, Sherburn, for W. J. Cameron & Co., Ltd.; new church at Ushaw Moor, for Rev. E. J. Beech; six dwelling-houses at Quarrington Hill, for L. W. Rowe; six dwelling-houses at Auton Stile, for Gabriel Inness.

THE Guildford Board of Guardians have agreed that the men's quarters be so altered as to provide additional accommodation for thirty inmates; that a new house for the master and matron be erected in accordance with a plan submitted to the committee by Mr. E. L. Lunn, and that the central portion of the administrative block be so altered as to provide bathrooms for each sex and bedrooms for the officers. An approximate estimate of the cost of the proposed alterations is 1,800*l.*

AT the last meeting of the Renfrew county buildings committee Mr. T. G. Abercrombie, architect, Paisley, submitted alternative plans for the proposed extension of the County Buildings. One set of plans provided for a building of two storeys to be used wholly as offices, and the other for a building of three storeys to be used as offices and dwelling-houses. Mr. Watson, measurer, estimated the cost of the former building at 5,210*l.*, and the latter at 6,240*l.* It was agreed to proceed with the erection of the three-storey building.

A MEMORIAL signed by about fifty builders and others interested and engaged in the building trades in West London has been issued as a further protest against the Budget. The memorialists state that they "view with great alarm the recent unprecedented increase in unemployment, which is due to the unjust proposals in the present Budget to tax land, which are causing great uncertainty in business transactions, and will result, if the proposals become law, in many old and trusted employés being thrown out of work; and we unanimously condemn and protest against the land clauses of the Finance Bill, which are causing this wide distress We have



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not purchased any land since the publication of the Finance Bill, nor do we intend to until we feel assured that security of contract will be respected by the Government." A similar announcement has been made by the builders in the North-West of London.

The building committee of the Aston Board of Guardians at their last meeting considered and adopted the report of the sub-committee, who stated that plans and specifications had been submitted by Messrs. Whitwell & Son in respect of the proposed new infirmary and laundry, and by the clerk in respect of the provision of boilers and heating apparatus, received from Messrs. Bernard Hall & Jones, engineers. They recommended, however, that in view of the suggested changes in local Poor-law areas and administration, this work be not proceeded with at present, and that the clerk take charge of the plans. The rough estimates of the proposed works are 69,900*l.* and 6,500*l.* respectively, and as the arrangements with the architects and engineers provided for a payment at the rate of 2½ per cent. upon a reasonable estimate of the cost of the works if for any reason they were not executed, the committee were of opinion that respective payments of over 1,700*l.* and 160*l.* had been earned. They therefore recommended that application be made to the Local Government Board to borrow 2,000*l.* for the purposes of making payments of 1,500*l.* and 125*l.* on account. The committee also recommended that a house be built for the master and matron on the lawn to the south of the workhouse chapel.

The Glasgow Dean of Guild Court on the 14th inst. granted the following linings:—The Steel Co. of Scotland, Ltd., 23 Royal Exchange Square, to erect buildings at Blochairn; the Minard Building Co., to erect tenements and dwelling-houses in Killearn Street, Possilpark; M. Henderson, contractor, Grant Street, to erect buildings at the corner of Great Western Road and Crow Road, and at the corner of Great Western Road and Ancaster Drive; W. Anderson, joiner and builder, 30 King Edward Road, Jordanhill, to erect tenements and dwelling-houses at the corner of Pollokshaws Road and Mannering Road; W. Cochrane, Auchinairn Road, Bishopbriggs, to erect two tenements of dwelling-houses in Ellangowan Road, Shawlands; Springburn Skating Rink Co., to erect a skating rink in Campbell Street; Richmond & Henderson, architects, 116 Hope Street, to erect a double villa in Blairbeth Drive; G. Eadie & Sons, 405 Mathieson Street, to erect four tenements of dwelling-houses in Hollybrook Street; Henry Erskine Gordon, of Aikenhead, Cathcart, to form a street and sewer on the lands of Clincart Mount Florida; the Queen's Park Football Club, Ltd., 216 West George Street, to erect pay entrances and exit gates at Somerville Drive; the Dennistoun Roller Rink Co., to erect a roller-skating rink to the west of Finlay Drive; the General Building Co., 159 Bath Street, to construct a road 40 feet wide beginning at John Street and terminating at Lochburn Road, also to erect four blocks of cottages at Lochburn; John Porter, house factor, 577 Dalmarnock Road, to erect four tenements of shops and dwelling-houses on the north-east side of Dalmarnock Road.

VARIETIES.

A covered shelter is to be erected in Crescent Gardens, Harrogate, by the Town Council at a cost of 1,000*l.*

Surbiton District Council have decided that the special committee shall report on the suggestion of a sewerage scheme for the district. The rejected schemes have cost the ratepayers 2,309*l.*

There are three candidates for the office of Lord Dean of Guild of Edinburgh, viz.:—Mr. J. Macintyre Henry, architect; Mr. W. Allan Carter, C.E.; and Mr. Neil M'Leod, builder.

The twelve mechanical filters at Fairmilehead, installed by the Edinburgh and Leith District Water Trust at a cost of 1,700*l.*, have been formally opened. The system is the patent of Messrs. Bell Bros., Ravensthorpe, Yorkshire.

Messrs. Wm. Watkins & Sons, architects, Lincoln, have been appointed to prepare plans for the proposed Council school in Hungate. The education committee's decision of October 7 to organise a local competition has been accordingly negatived.

Messrs. Alex. Cullen, Lochhead & Brown, architects, Hamilton, N.B., have prepared plans for alterations and additions to the local fever hospital estimated to cost 6,500*l.* Before coming to a final decision the Town Council will obtain a report as to the cost of an entirely new hospital on another site.

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The Liverpool City Council have adjourned the consideration of a rehousing scheme submitted by the housing committee, in connection with which it was recommended that the Local Government Board should be asked to sanction a loan of 225,000*l.*

The Maidstone Urban Council have approved the following plans:—Four houses for Messrs. Clarke & Epps; Hastings Road, five houses for Messrs. Clarke & Epps; Union Street, addition to house for Miss Coveney; Tonbridge Road, house for Mr. Frederick Corfe.

The Local Government Board have informed the Weybridge Urban Council that they will not decline to sanction the 5,000*l.* loan for the purchase of the common and heath, if the Charity Commissioners will authorise the sale—a step to which they have already practically committed themselves.

Morecambe Town Council on Monday decided to borrow 12,415*l.* for the erection of a new art and technical school, in conjunction with the Lancashire County Council. The Council approved of the appointment of Mr. William Ryle Wright, London, as consulting engineer for the electrical undertaking for a period of two years, at a fee of 100 guineas per annum, and 3½ per cent. commission on any further capital expenditure needed. The resignation of the borough electrical engineer, Mr. W. H. Hall, was accepted.

The Burslem Town Council last week, after a long debate, decided by a majority of five votes to instruct Messrs. Russell & Cooper, who were awarded first place in the competition, to prepare complete plans and specifications and to obtain tenders for the proposed municipal buildings. The cost was limited to 25,000*l.*, with a 10 per cent. margin and exclusive of architects' fees and sundry other matters. The winning design has been amended since the award was made.

The surveyor to the Holywell Urban Council (Mr. R. A. Thomas) has submitted a report as to the cost of a softening plant and the cost of softening the water of St. Winifride's Well, which it is proposed to utilise for a public supply for Holywell. The total hardness of the water is 18.3 degrees, and from tests made it has been found that it can be reduced to 5 degrees at a cost of about .88 of a penny per 1,000 gallons. The report stated that the water from the well from a purity point of view stands very high.

MESSRS. CHUBB'S NEW FACTORY.

Last year Messrs. Chubb celebrated their ninetieth birthday by Sir George Hayter Chubb, the grandson of the founder, publicly laying the foundation-stone of a new factory at Wolverhampton. Their ninety-first year was marked on the 14th inst. by the Lord Mayor of London formally opening the new works. Of late years the tendency to call attention to cases of individual longevity has made nonagenarians persons of more than local celebrity, more especially if they retain the full possession of their faculties. But in the case of Messrs. Chubb, each additional year seems to bring an increase of vigour and youth, and after ninety have gone by instead of signs of senile decay we see a firm who appear to be barely beginning operations.

About ten years ago Messrs. Chubb were faced with the necessity of extending their factories. In 1901, by way of experiment, they set up a small branch to their London safe-making works alongside their lock works at Wolverhampton. At the same time the relative merits and demerits of other towns were fully gone into. After detailed consideration the decision was arrived at that Wolverhampton was the most suitable, and a freehold plot ten acres in extent was purchased. Among special advantages of Wolverhampton were the railway facilities, the municipal electricity, and the existence of excellent housing accommodation.

Plans for the new buildings were prepared by Mr. G. Gordon Stanham, of Bush Lane, Cannon Street, E.C., with Mr. C. H. M. Mileham as consulting architect. The local superintending architect was Mr. F. T. Beck. The new factory covers a total area of 63,500 square feet. The chief feature is the large erection shop, here illustrated, for the construction of steel strong rooms, treasuries, and safe deposits, which have always been a speciality of Chubb manufacture, this shop being 350 feet long and 40 feet wide, with a height of 33 feet clear of all girders and roof principals. The height of the remainder of the factory is from 16 feet to 14 feet at the lowest part.

Nearly the whole area is undivided by party walls, and the general design of the buildings gives the maximum amount of light, while avoiding as much as possible direct sun rays, and careful consideration has been given to the question of sanitation and ventilation.



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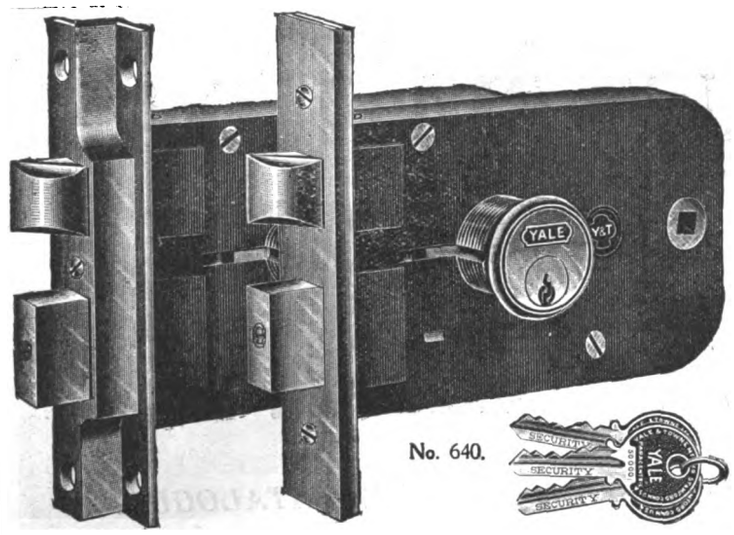
Electric power is used throughout, and power rooms have been erected and plant therein fitted which will take its electric supply at 5,000 volts from the Corporation mains. This is reduced to 400 volts and distributed amongst thirty motors of various powers from 2½ to 20 h.p., the total providing a nominal horse-power of 200. Electric lighting is also installed.

Many labour-saving devices are introduced, such as travelling cranes and mono-rails. But conspicuous among them are the electric magnets for unloading and handling the steel plates, bars, scrap metal, and similar material without using slings or chains for attaching the material to the crane hook, as supplied by the Witton Kramer Electric Tool and Hoist Co., Birmingham. The crane can lift loads of 1½ tons at a speed of 25 feet per minute, cross traverse with same at 60 to 80 feet per minute, and longitudinal travel the whole length of the building at a speed of 200 feet per minute. The crane bridge consists of a single beam of "I" section R.S.J. The span is 40 feet.

Each motion is driven by a separate electric motor, which is controlled from the cab of the crane. The load can be lifted, traversed, or travelled in either direction by moving a lever handle in the same way as a tramway controller is operated. The magnetic equipment comprises three ironclad lifting magnets, each consisting of a coil of insulated copper-wire contained inside an iron shell; they are attached to a bar suspended from the hook of the crane, and operated by a controller placed with the other controllers in the crane cab.



These magnets lift steel plates, bars, castings, bolts, scrap metal, &c., electrically, it being only necessary to lower them on to the material and operate the switch, when the magnetic force attracts the material and holds it securely until the current is switched off. There is no danger to men working underneath the crane, particularly when, as in the present



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case, the magnets are supplied by a separate dynamo in parallel with an accumulator battery, which, should the dynamo generating the current for the magnets break down or cease to work for any purpose, immediately takes up the load and continues to supply the magnets until the dynamo can again be run. The labour saved by the use of electro lifting magnets is most remarkable.

Hydraulic power is laid on all over the works for use in bending presses, rivetting machines, and for holding down work on other machines. A double furnace for hardening two large plates at once for strong-room work will be provided complete with electric mechanism for registering the temperature so as to insure the plates not being over-heated. Acetylene gas plant is provided for the welding process. The general contract for the buildings was placed in the hands of Messrs. Henry Lovatt, Ltd., of Wolverhampton. The steel construction is by Messrs. Drew Bear, Perks & Co., of London. The electric plant is supplied by the British Westinghouse Co., the consulting electrical engineers being the British Engine, Boiler and Electrical Insurance Co., Ltd., of Manchester.

Messrs. Chubb have retained a large area behind the new factory for the erection of future extensions. To many of the visitors who attended the opening ceremony last week and who were impressed by the size of the latest building, this may have seemed like thinking a little too far ahead. But the firm seem to have the secret of perpetual youth, and the concern, though now a private limited company, is chiefly owned and entirely managed by the Chubb family in conjunction with a board of directors.

The journey both to Wolverhampton and returning to London was by a special train of nine corridor dining cars, L. and N.W. Railway. Luncheon was served on the way down and dinner on the return journey. A number of architects were included in the large party, and were evidently impressed by the proceedings, which were carried out with what might almost be termed military precision. A pleasant little ceremony took place at the Town Hall, when the Lord Mayor of London was welcomed by the Mayor of Wolverhampton and thanked for his visit, and the freedom of the borough was then conferred on Sir George Hayter Chubb, Bart., and on Mr. Alderman Marston, of Wolverhampton.

THE PRESENT POSITION OF THE SEWAGE DISPOSAL QUESTION.*

(Concluded from last week.)

(3) *Biological Action on Deposited Matters.*—As showing the action of the slate beds in effecting the destruction of the solid refuse in sewage the detailed account of some experiments will be of interest.

The destruction of waste organic matters is not due to purely direct physical and chemical causes, but to digestion. On looking at a mass of the deposit on a slate which has been employed for some time in a bed the casual observer would notice nothing but a collection of *débris*. On smelling the mass it is at once realised that it differs from ordinary sludge in that it is inoffensive. On allowing a portion to dry it does so rapidly and without the production of offensive emanations given off by "sludge."

These two facts point to a difference, and invite closer examination. This may be conveniently made as follows:—

Place a portion of the deposit on a small piece of slate, about 3 inches or 4 inches square for convenience, or other suitable support, and warm it very gently by applying heat to the under surface. A considerable movement will soon be seen to take place on the immediate surface, and gradually a heaving mass of minute worms will struggle to escape from the heated underlayer. These are clearly aërobic organisms whose power of digestion is considerable, and it is to a great extent their casts which form the inoffensive humus which escapes from the slate layers with the effluent, thereby preventing the accumulation which is the cause of the choking of the old coarse contact beds.

Next, take a fragment from the surface of the deposit by touching it with the point of a wire and place it on a microscope glass slide with a droplet of water, covering the whole with a thin glass cover in the usual manner. Now examine this with a ¼-inch or higher power. It will be at once seen to be largely made up of innumerable living organisms of great complexity and variety, other than the worms.

From these simple examinations it will be evident that, instead of an inert mass of matter, we have a hive of active and voracious living organisms, from the lowest type of

* A paper read on October 6 before the Institute of Sanitary Engineers by Mr. W. J. Dibdin, F.I.C., F.C.S., &c.

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bacteria up to the highly organised worms, larvæ, &c., which, like a collection of animals in a zoological gardens, feed upon the daily supply of food given to them, and so long as this supply is steadily and regularly maintained, so long will they perform their life functions, and in so doing destroy the waste organic matters which, in their collective form, we call sludge; the process involved being merely that of digestion—the waste products of one group being but food for a lower.

The process may very conveniently be watched from day to day by placing the previously mentioned small pieces of slate in an ordinary plate or saucer, and putting on the "living earth" on the slate small fragments of meat, bread, &c., and flooding the plate with water gently so as to completely cover the whole. After an hour or two gently decant the water from the slate so as to thoroughly drain the slate and deposit thereon. Leave it freely exposed to the air, preferably in a moderately warm atmosphere. On watching from time to time it will be seen that the piece of red meat has become coated with a grey deposit, this being often complete in four or five hours. Now touch the grey matter with the point of a wire, and transfer the minute quantity thus taken up to a microscope slide as before, and examine under a high power, when it will be seen that this grey matter is nothing but an enormous number of bacteria, many in a state of restless activity where they are not crowded in zooglea masses which prevent their rapid movements.

Continue these observations from day to day, each day flooding with water and draining after two hours or so. In a few days the solid particles of meat, &c., will become invisible and merged in the mass of black humus into which it is finally resolved.

It is evident that this is precisely what takes place in a slate bed. When the bed is first filled with sewage, and allowed to stand full in a quiescent state for a couple of hours, the solid matters settle on the slates. Until the "living earth" is fully developed, the destructive action is slow, but, in warm weather especially, the organisms rapidly develop and attack the food thus provided for them, exactly as the organisms in a river mud attack the matter deposited thereon from a tidal water receiving sewage, and if the ratio of organisms, food, and air supply are properly regulated, the action proceeds indefinitely without the evolution of nauseous odours.

(4) *Action taking place in respect to Finely-divided Matters, Colloids, &c., during the two hours' quiescence.*—Beyond the action on the coarser suspended matters, the slate bed, like the coke, &c., coarse beds which they are supplanting, exert an influence on those substances which generally come under the head, in practice, of "matters in solution," and are measured in analyses as "albuminoid ammonia," &c. The finely-divided particles are subject to the action of gravity, and if sufficient time be allowed will, by gravitational action, be arrested by heavier particles—slate slabs, for instance—in the same manner as will a chip of wood floating in a stream be attracted by, and adhere to, a boat or other larger particle.

Thus I have elsewhere shown, from experiments I made as far back as 1878, that even molecules of strychnine, morphia, acetate of lead, &c., will be abstracted from solution and stored in the pores of a filter, from whence they can again be washed, and will then appear in the filtrate.

In like manner we can easily understand how the more finely-divided particles of sewage matters, even those in true solution, can be arrested to a greater or less extent, according to the degree of fineness of the pores of the filtering media, and subjected to the attack of living organisms in a filter in the same way that food particles may be distributed among the rocks on a seashore, and there become the prey of the innumerable living creatures abounding thereon.

In this way we have, first (as set out above), mechanical, or, as I prefer to call it, gravitational, retention, and secondly, destruction and oxidation through the agency of living organisms.

It will be noted with interest how far all the modern processes of the last few years are founded on these factors.

(5) *Necessity for Secondary Treatment of Effluent from Slate Beds.*—As the slate beds are but a form of very coarse contact beds, it will be evident that the gravitational action will be insufficient in the case of the finely-divided matters, either in complete or semi-solution, and thus the effluent will seldom be sufficiently pure for final discharge into an ordinary running stream. In certain cases, as those in which the crude sewage to be dealt with is very dilute, the effluent from the slate beds will stand the incubation test for four

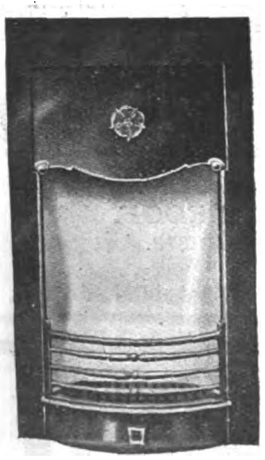
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days, and the chemical analysis will show a quality which would permit the discharge into, say, the Thames above lock; but in all ordinary circumstances a further treatment will be required.

Important evidence on this point was obtained by a comparison of the results of an investigation detailed by Prof. C.-E. A. Winslow and Earle B. Phelps in a paper read before the Sanitary Section of the Boston Society of Civil Engineers, on November 15, 1907, on "The Experimental Treatment of Boston Sewage on Sprinkler Beds." On comparing the results obtained with those from the treatment of a sewage of almost exactly comparable character at High Wycombe, on the slate beds, it was seen that the effluents differ essentially in favour of the latter system in respect of suspended matter.

The Boston effluent showed an increase from 9.4 to 9.7 grains per gallon, whereas the High Wycombe effluent showed a reduction from 10.2 to 3.6 grains per gallon. The reduction of organic nitrogen in the Boston effluent was 47 per cent. against 46 per cent. of albuminoid ammonia in the High Wycombe effluent.

The incubation test in both cases gave no fermentative change, and the conclusion is clearly that treatment of Boston sewage on slate beds similar to those at High Wycombe would give better results than those obtained by trickling filters. Further, the number of acres of beds 8 feet deep would be 23 for slates, against 50 required for trickling filters, as the number of gallons daily treated per cubic yard of bed was only 155 for trickling filters at Boston, against 336 for slate beds at High Wycombe.

The following table shows the comparative results:—

	Boston.		High Wycombe.	
	Sewage.	Effluent.	Sewage.	Effluent.
Suspended matters	9·4	9·7	10·2	3 6
Alb. ammonia	0·20*	0·11*	0·15	0·08
Free ammonia	0·98	0·73	1·05	1·07
Oxygen consumed	3·01†	1·75†	0·48‡	0·34‡
Percentage reduction:—				
Organic nitrogen	47		46	
Oxygen consumed	42		29	
Suspended matters	Increased by 9 per cent.		Decreased by 62 per cent.	

* = ½ kjeldahl. † = at boiling point. ‡ = 4 hours at 80 deg. F.

The ability of a slate bed effluent obtained under favourable conditions to stand the incubation test for four days was confirmed by the results of the treatment of the sewage of Belfast, when the suspended matters were reduced from 20.4 to 0.93 grain per gallon, equal to 95.5 per cent. reduction. When the beds were filled once daily the purification by the albuminoid ammonia test was equal to 47 per cent., and when filled three times daily to 34 per cent., the resulting effluents being such as would be admitted to ordinary inland rivers.

When secondary treatment is necessary, as in the majority of instances, the discussion of the action of the slate beds is not affected, as they have done their work, but it may be as well to point out in this connection that as the great object of sewage treatment is to avoid nuisance, the process which accomplishes the work with the minimum risk of nuisance would obviously be the one to be preferred. Also, that if one of the first laws of mechanics—viz., the avoidance of friction, in other words, "working parts"—is equally to be observed, then the contact beds have in fact, as well as in historical record, the first place. On this point the Fifth Report of the Royal Commission on Sewage Disposal, issued in 1908, is very emphatic. On page 321, "Summary of Conclusions and Recommendations," they say, "The risk of nuisance from smell is greater with percolating filters than with contact beds."

"With percolating filters there is apt to be nuisance from flies, especially with filters constructed with coarse filtering material."

Fine contact beds, such as those at Barking (1 acre), Sutton, Leatherhead, Ewell, Cobham, &c., have been steadily at work in some cases for sixteen years without giving any trouble, and, on the showing of the Royal Commission, are less likely to cause nuisance than the more modern percolating filters which have moving gear, require frequent cleansing, and are more likely to cause nuisance both from smell and flies than the older method which they claimed to displace.

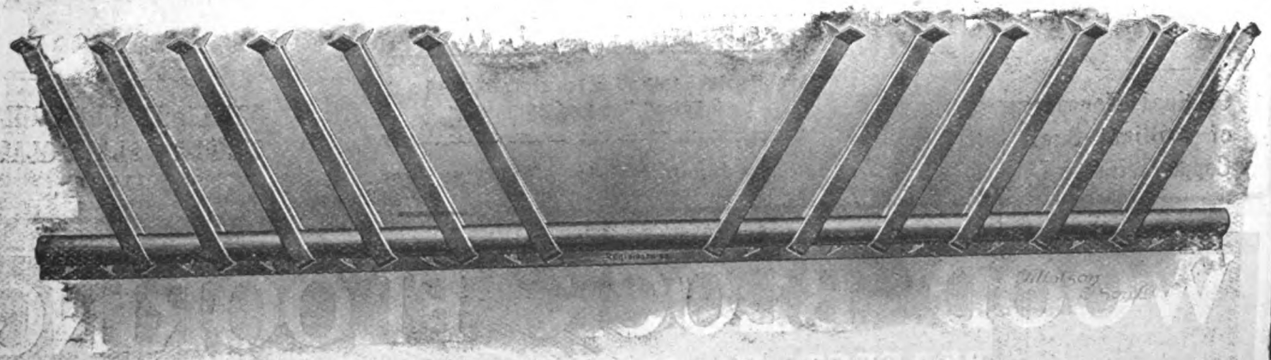
If maximum efficiency, therefore, be the object, there is no question but that the contact beds are the best.

(6) *Extent to which Secondary Treatment should be Carried.*—This entirely depends upon local conditions. If the discharge of the final effluent is to be into a tidal estuary,

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&c., away from possible risk to oyster, &c., fisheries, then, in many cases, there need be nothing beyond the primary treatment on the slates. If the shell-fish question, or possible contamination to water supplies has to be considered, then doubtless secondary treatment on fine contact beds, followed by sand filtration, or sterilisation by chlorine, ozone, &c., will be desirable.

As an instance of sand filtration, the installation for the treatment of the sewage from the county asylum of the Surrey County Council at Netherne will be of interest.

In this case the site is surrounded by various deep wells in the chalk supplying considerable populations, and as there is no brook, &c., for the effluent to be sent into, it must all be disposed of by irrigation on the surface of the ground on the top of the chalk hills on which the asylum is situated.

The process adopted, therefore, is somewhat drastic.

In the first place, it must be mentioned that, as in the case of all asylums, the laundry water occupies a prominent feature in the question, and in order to prevent the beds being alternately dosed with hot concentrated soapy water at one time, and then with sewage, a special laundry water tank is provided into which a separate drain from the laundry discharges.

The outlet from this tank is so arranged that the tank is continually discharging into the main sewer carrier, feeding the slate beds, and at such a rate that on each Monday morning the laundry water tank is completely empty. Thus this tank acts as a cooling, mixing, and regulating tank.

The main sewage carrier, with the proportionate quantity of laundry water, feeds a series of six slate beds, from whence the effluent discharges on to six medium clinker beds, thence to six fine clinker beds, and thence to two sand filters, only one of which is at work at one time, and from thence to distributing channels on the land.

In most cases it is sufficient to adopt only a secondary treatment on fine contact beds. But if these beds are not properly constructed, as is the case in too many instances, the effluent may not at all times comply with the requirements of the river authorities, and in that case one of the most simple and efficacious expedients is to allow the effluent to flow over grass land to effect further clarification both by deposition of any suspended humus, gravitational action, as in a contact bed—the stems of the grass, &c., acting as contact media—and aëration, with the result that a bright effluent will be at all times obtained, such as those from contact beds properly made and worked. A similar result can be secured on heavy clay lands by burning the clay and replacing it as a layer on the surface. In this way an excellent effluent is obtained in the case of one installation of slate beds, the effluent from which simply flows over the layer of burnt ballast, and thence over the grass land to the river.

It will thus be seen that the slate bed system is the most economical and efficacious for the treatment of the solid matters in the sewage, and does, in fact, abolish the sludge difficulty, and enables an excellent effluent to be secured by the most simple and least expensive means, which at the same time are less liable to nuisance than other methods. Thus, by the combination of slate beds with fine contact beds we have, in fact, as indicated by the Royal Commission in their various reports, perfect freedom from nuisance in all stages of the process, and we must therefore have the maximum of efficiency, as the whole crux of the sewage question is summed up in one word—"nuisance"—to show how to abolish which the Royal Commission has itself expended large sums and given much valuable time. Slate beds constitute the only known method of abolishing the sludge nuisance, and that at practically but little working cost, while the fine contact beds finish the work, also without involving the use and consequent repair of working parts, and with the minimum expenditure for labour and renewals.

A Local Government Board inquiry was held at North Ormesby, near Middlesbrough, by Mr. A. G. Drury, M.Inst.C.E., into an application by the Council for a loan for main sewerage works for North Ormesby. The scheme consists in the relaying of part of the present outfall sewers and the construction of new intercepting sewers for the relief of the existing branch sewers and for the future development of the district. About three miles of sewers, varying in diameter from 24 inches to 9 inches, will be laid, with manholes at each change of direction and gradient. New manholes and ventilators will also be constructed on the existing sewers. The scheme was explained by Mr. D. Balfour, junr., M.Inst.C.E., representing the engineers, Messrs. D. Balfour & Son, of Newcastle-on-Tyne and London.

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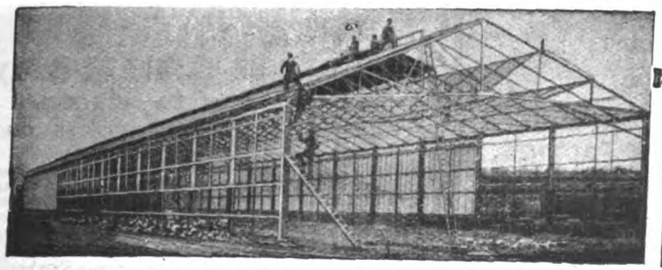
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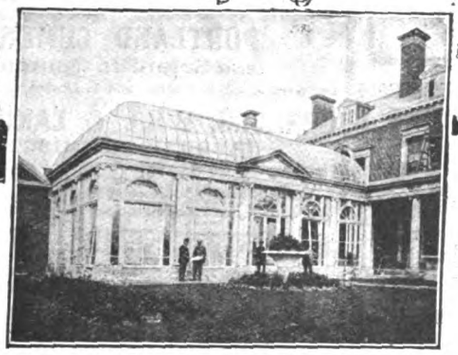
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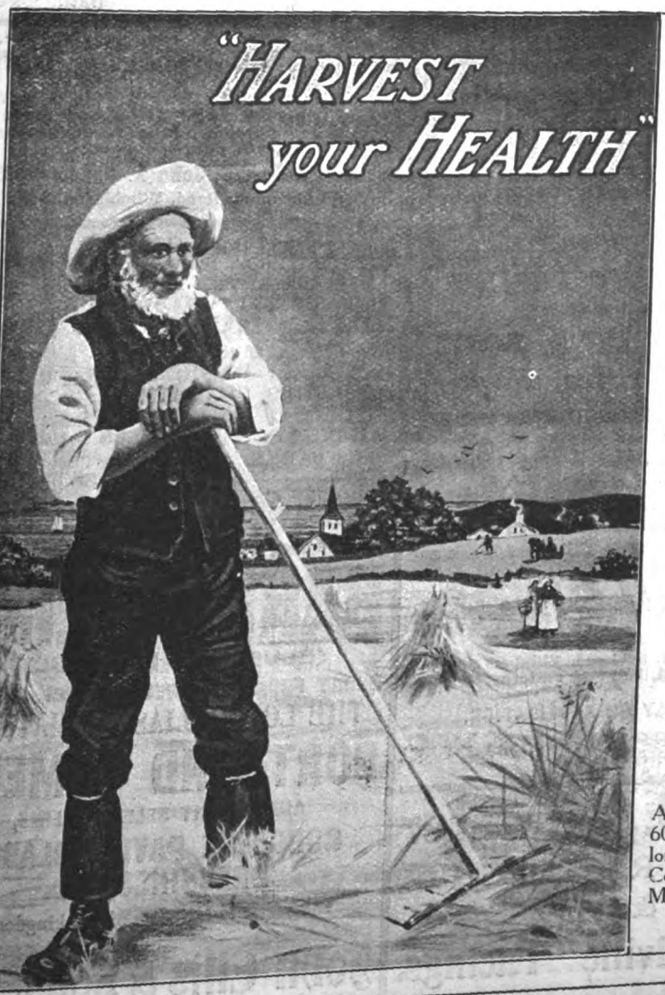


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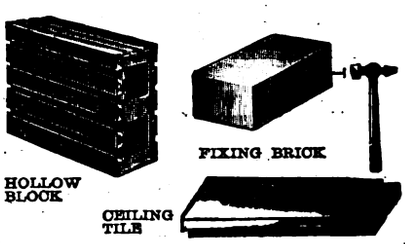
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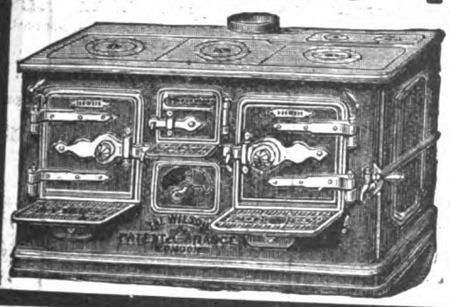
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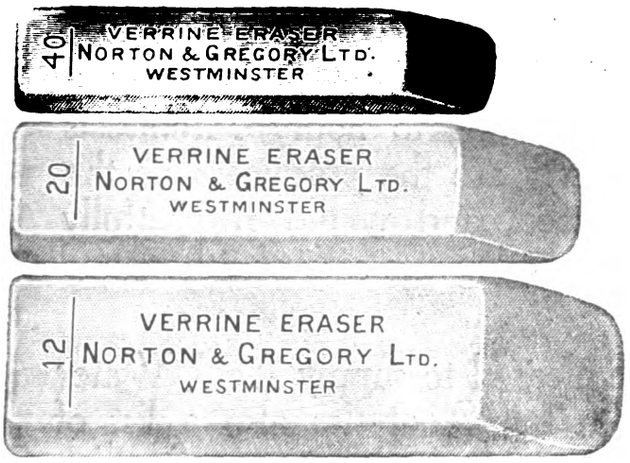
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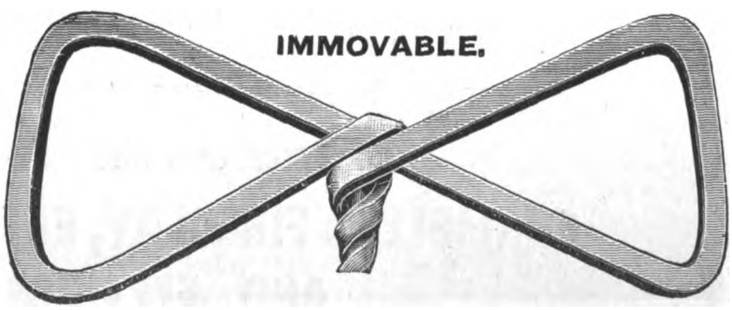
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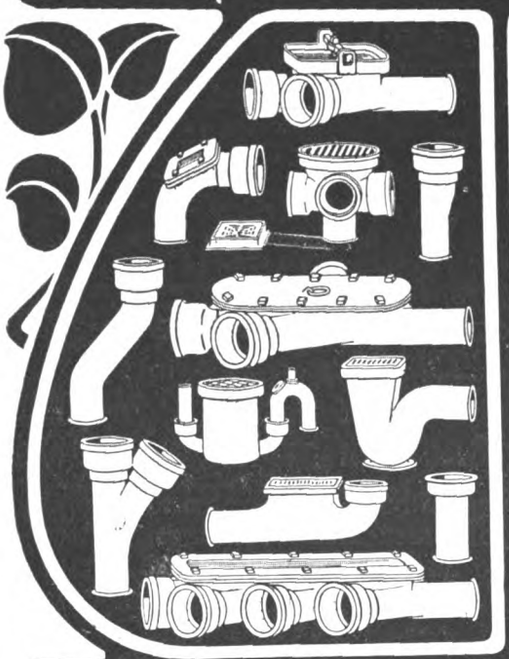
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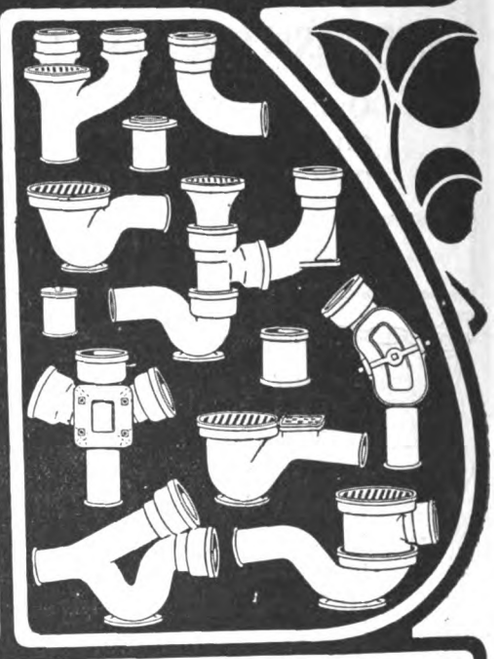
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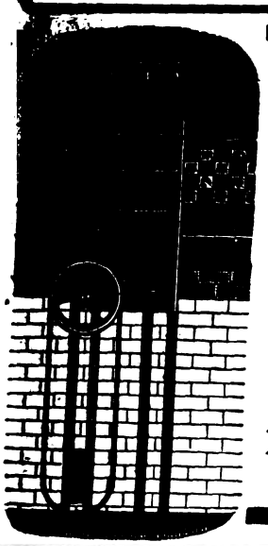
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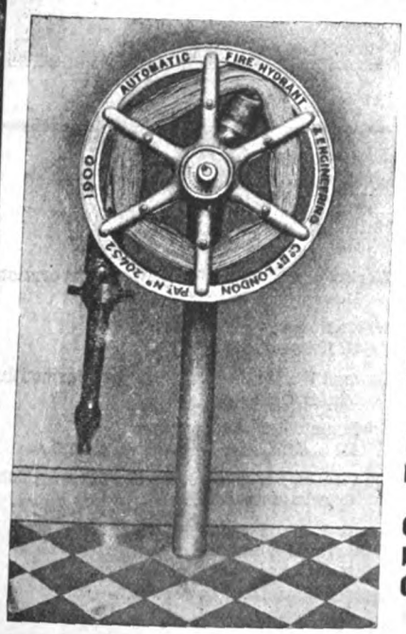


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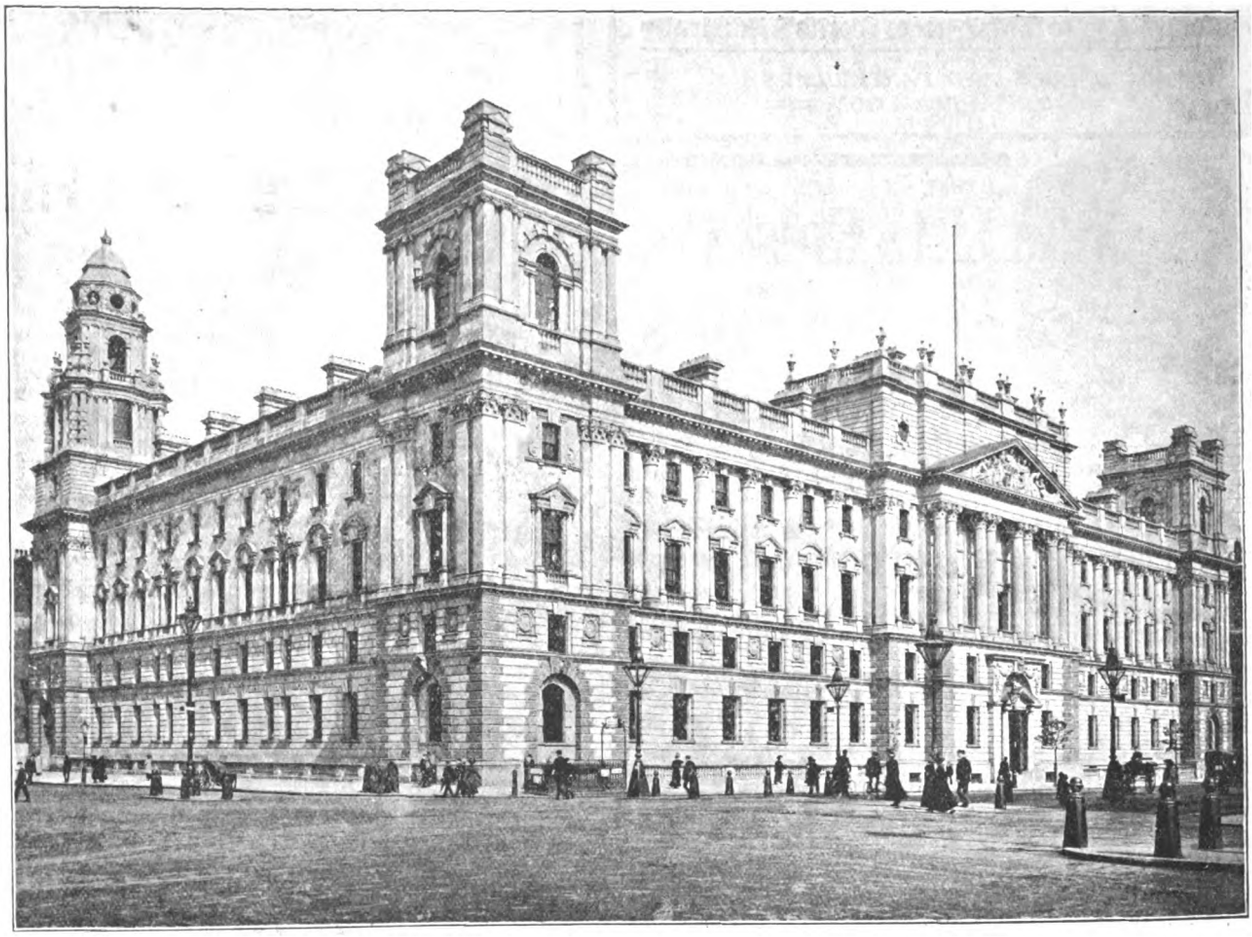
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Architect and Contract Reporter.

FRIDAY, OCT. 29, 1909.

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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

KENDAL.—Nov. 1.—The Corporation invite architects residing and practising in Westmorland to submit designs with description and estimate of a technical school. Premiums of 15*l.*, 10*l.*, and 5*l.* are offered.. The Borough Surveyor, Kendal.

LEEDS.—Dec. 18.—The education committee invite architects practising in Leeds to submit designs for proposed training college for teachers, Kirkstall Grange, Far Headingley. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist the committee. Deposit 2*l.* 2*s.* Mr. James Graham, Secretary for Education, Education Department, Leeds.

MINEHEAD.—Dec. 11.—For a shelter with cloak-room and lavatories, on the beach at Minehead, Somerset, to cost not more than 3,000*l.* Deposit 5*s.* Premium 20*l.* The premiated plans to become the property of the Council; or, in event of the architect carrying out the work, the premium will merge in the commission. Mr. L. C. Webber-Incledon, clerk, 16 Park Street, Minehead, Somerset.

PRESTON.—Nov. 1.—The Corporation invite designs for a boys' grammar school. Premiums of 50*l.*, 30*l.* and 20*l.* Mr. Alfred Howarth, town clerk, Town Hall, Preston.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

WORKINGTON.—Nov. 30.—The Cumberland education committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the borough of Workington, Cumberland, for about 300 pupils of both sexes. Deposit 1*l.* 1*s.* Mr. C. Courtenay Hodgson, secretary, The Courts, Carlisle.

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CONTRACTS OPEN.

Belfast.—Nov. 3.—For erection of two workmen's houses and a store and out-buildings at the works at Oldpark. Mr. R. Hamilton, secretary, Water Office, Belfast.

Belfast.—Nov. 6.—For building schools for the Select Vestry of All Saints' Parish. Mr. William J. Fennell, F.R.I.B.A., architect, 2 Wellington Place, Belfast.

Bentley-with-Arksey.—Nov. 5.—The West Riding education committee invite whole or separate tenders for the following work, viz.:—Bentley-with-Arksey, new school (builder, joiner, tiler, plasterer, plumber, painter). Deposit 1*l*. The West Riding Architect, County Hall, Wakefield.

Blackburn.—Nov. 18.—For erection of Council school, Bangor Street. Deposit 1*l*. 1*s*. Apply at once to Messrs. Cooper & Slater, architects, 13 Richmond Terrace, Blackburn.

Blaydon-on-Tyne.—Nov. 1.—For erection of a drapery shop at the Mickley Square branch. The committee of the Blaydon Co-operative Society.

Bournemouth.—Nov. 5.—The Town Council invite schemes and tenders for the construction of six cells, as additions to their existing destructor. Deposit 5*l*. 5*s*. Mr. F. W. Lacey, M.I.C.E., borough engineer, Municipal Buildings, Bournemouth.

Bury (Lancs.).—For additional workhouse accommodation. Deposit 5*l*. Send name and addresses to Mr. Alfred Hopkinson, architect, 15 Agur Street, Bury.

Bury St. Edmunds.—Nov. 20.—For the provision of a cookery room, assembly hall, and alterations to the County school and P.T. Centre. Mr. A. Ainsworth Hunt, building inspector, Shire Hall, Bury St. Edmunds.

Cranbrook.—Nov. 3.—For the erection of a tramp ward, lavatory and alterations at the workhouse. Mr. C. Payne, surveyor, Cranbrook, Kent.

Dartmouth.—Nov. 2.—For additions and renovations to Stokecliffe. Deposit 1*l*. Mr. W. Percy Marr, A.R.I.B.A., architect and surveyor, Dartmouth.

Dearham.—Nov. 1.—For erection of a dwelling-house. Mr. George Cameron, Craika Road, Dearham, Cumberland.

Hailsham (Sussex).—Oct. 30.—For erection of a classroom, &c., for the girls' department of the County Council's public elementary school. Send names to Mr. F. J. Wood, county surveyor, County Hall, Lewes.

Halifax.—Nov. 11.—For the erection of a store, butcher's shop, and appurtenances; also two through dwelling-houses at Skircoat. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

Handsworth.—Nov. 2.—For tiling, slating and repairing the roof of Victoria Park House, Grove Lane. Mr. H. Richardson, A.M.I.C.E., surveyor, Council House, Handsworth, Staffordshire.

Heavitree and Newton Abbot.—Nov. 19.—For new Council schools as follows, for the Devon County Education Authority:—At Heavitree, Ladysmith Road, for 360 children; and Newton Abbot, Wolborough, for 240 children. Deposit 1*l*. 1*s*. each. Send names to the County Architect (Education), 1 Richmond Road, Exeter.

Hoylake (Cheshire).—Nov. 1.—For the erection of schools to Presbyterian Church. Mr. Owen Roberts, architect, 9 Cook Street, Liverpool.

Ireland.—Nov. 1.—For building fifteen labourers' cottages and fencing the plots to be attached, at Clermont Park, for the Dundalk Rural District Council. Mr. P. R. Finigan, clerk, Workhouse, Dundalk.

Ireland.—Nov. 1.—For the erection of Central Technical Institute, Military Road, Limerick. Deposit 1*l*. Mr. James MacKay, quantity surveyor, 58 Dame Street, Dublin, and 82 South Mall, Cork.

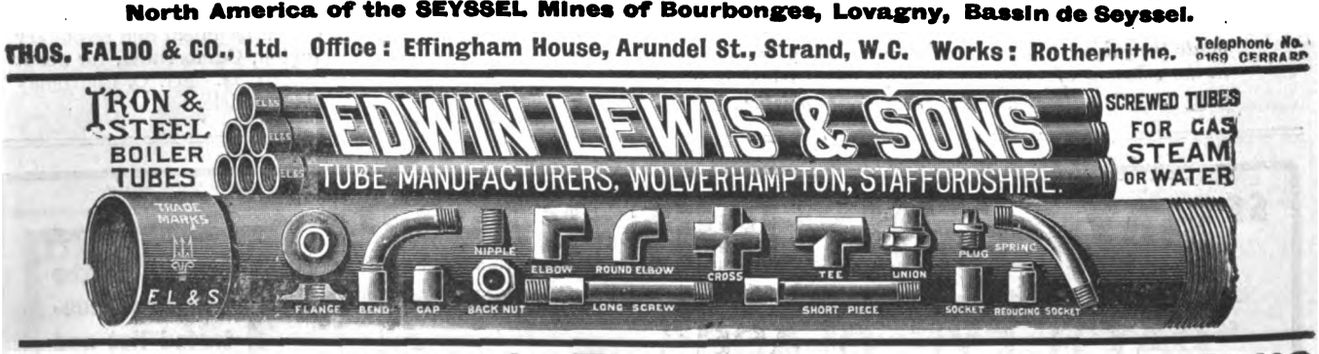
Ireland.—Nov. 3.—For the erection of two semi-detached houses at Inchicore. Mr. R. Crawford, secretary to the Great Southern and Western Railway, Kingsbridge Terminus, Dublin.

London.—Nov. 1.—For the adaptation of Nos. 10 & 11 Royal Parade, London Road, Croydon, for labour exchange. The Postmaster, Head Post Office, Croydon.

London.—Nov. 17.—For the construction of a store building and other contingent works on land at the Battersea works of the Board, for the Metropolitan Water Board. Chief Engineer, Savoy Court, Strand, W.C. Deposit 10*l*. with the Accountant at Savoy Court, Strand, W.C.

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LEESRIGG.—Oct. 30.—For the various works required in erection of two dwelling-houses. Mr. Wm. Lowes, Leesrigg, Mealsgate, Cumberland.

LIVERPOOL.—Nov. 15.—For bricklayer's work in construction of area walls and keeper's quarters at the new chief offices for the Royal Liver Friendly Society, Liverpool. Deposit 1*l.* Mr. W. Aubrey Thomas, architect, 14 Dale Street, Liverpool.

LIVERSEDGE.—For the various trades for five houses. Mr. Alfred E. Rhodes, architect, Liversedge, Yorks.

LUDDINGTON.—Oct. 30.—For asphalting the playgrounds and for small structural alterations at the Luddington Council school, Lincs., for the Lindsey County Council (education committee). Mr. S. Maudson Grant, secretary 286 High Street, Lincoln.

LUDLOW.—Oct. 29.—For converting house in Castle Square into a girls' secondary school, for the education committee of the Shropshire County Council. Deposit 1*l.* 1*s.* Send names to Mr. Harold Brakspear, F.S.A., A.R.I.B.A., architect, Corsham, Wilts.

MERTON.—Nov. 15.—For erection of a block of five cottages and a block of eight cottages in Mill Road, Merton Abbey Estate, High Street, Merton, S.W. Mr. Henry R. G. S. Smallman, A.R.I.B.A., 8 Queen Street, Cheapside, E.C.

MORECAMBE.—Nov. 18.—For the construction of underground conveniences on Promenade, near clock tower. Deposit 2*l.* 2*s.* Mr. J. W. Hipwood, A.M.I.C.E., borough surveyor, Morecambe.

OLD HILL.—Nov. 15.—For erection of a public elementary Council school for 250 infants at Tividale, Rowley Regis, Staffs. Deposit 1*l.* 1*s.* Send names by Nov. 1 to Messrs. Pritchard & Pritchard, architects, Kidderminster.

PORTSMOUTH.—Nov. 1.—For pulling down old buildings and erecting a garage and workshop and repairs to existing workshops, &c., in Swan Street. Messrs. Rake & Cogswell, architects, Prudential Buildings, Portsmouth.

PORTSMOUTH.—Nov. 15.—For constructing, completing and maintaining in thorough repair for six calendar months a six-stall urinal in Eastney Road, Eastney. The Borough Engineer's Office, Town Hall.

RAMSGATE.—Nov. 6.—For the provision of a rock maple block floor at the Royal Victoria Pavilion. The Borough Engineer's Office, Albion House, Ramsgate.

SCOTLAND.—Oct. 30.—For the mason, carpenter, plumber, slater, plasterer, painter and glazier works of proposed alterations and additions to the Star Inn, Buckie. Mr. Wm. Hendry, architect, Buckie.

SCOTLAND.—Nov. 9.—The Galashiels Burgh School Board invite separate tenders for the mason, joiner, plumber, slater, painter, glazier, ironwork and fittings of the Burgh Academy, to be built on the Melrose Road. Messrs. J. & J. Hall, architects, Galashiels.

SHIREBROOK.—Nov. 6.—For proposed Council school for girls at Shirebrook, Derbyshire, to accommodate about 320 girls, with cookery room in addition. Deposit 1*l.* 1*s.* Mr. George H. Widdows, A.R.I.B.A., architect, County Education Office, St. Mary's Gate, Derby.

SHOREHAM.—Nov. 5.—For the erection of a rocket life-saving apparatus house at Shoreham, Sussex, for the Board of Trade. The Coastguard Station, Shoreham.

SUTTON-IN-ASHFIELD.—Nov. 1.—For the construction of entrance gates, weigh office, coal store, tar tanks, apparatus, buildings, roads, &c., in connection with gasworks extension, for the Urban District Council. Deposit 3*l.* 3*s.* Send names and addresses to Messrs. Corbet Woodall & Son, Palace Chambers, Bridge Street, Westminster, S.W.

SWINTON.—Oct. 31.—For the erection of a new school to accommodate 1,250 scholars. Send names by above date to Mr. W. T. Postlethwaite, Council Offices, Swinton, Manchester.

WALES.—Nov. 1.—For erecting a shop and bakery at Pencoed. Mr. W. Y. David, architect, Bridgend.

WALES.—Nov. 3.—For erection of a chapel and schoolroom, &c., at the Rhosesmor Welsh C.M. Church, Holywell. Mr. Daniel Hughes, secretary, Esmor House, Rhosesmor, Holywell.

WALES.—Nov. 3.—For erection of playsheds at Williams' Endowed Schools, Caerleon, Mon. Mr. Henry J. Griggs, architect, Metropolitan Bank Chambers, Newport, Mon.

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a male imbecile day room at the Union workhouse; (2) provision of lavatory accommodation at the Union Offices, Alexandra Road. Deposit 2*l.* 2*s.* Mr. Charles T. Ruthen, architect, Bank Chambers, Heathfield Street, Swansea.

Wales.—Nov. 9.—For erection of twenty-four or more dwelling-houses, with roads, sewers, &c., at Aberfan, for the Pleasant View Building Club. Mr. O. P. Bevan, architect, Express Chambers, Merthyr Tydfil.

Wales.—Nov. 11.—For erection of twenty-four or more dwelling-houses, together with the construction of roads, sewers, &c., at Aberfan, for the Pleasant View Building Club. Mr. O. P. Bevan, architect and surveyor, Express Chambers, Merthyr Tydfil.

Wales.—Nov. 15.—For building three houses on site of Old Parrot Inn, Caerphilly. Messrs. D. Williams & Co., T.V. Brewery, Merthyr.

Walkden (Lancs.).—Nov. 6.—For erection of a technical school at Walkden, for the Worsley Urban District Council. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Widnes.—Nov. 13.—For the enlargement and extension of the Widnes Municipal secondary and technical school. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Wrexham.—Nov. 10.—For supplying and fixing glass roofs to the balconies at the new workhouse infirmary. Mr. J. Price Evans, Argyle Chambers, Wrexham.

Wrightington, near Wigan.—Nov. 8.—For erection of an elementary school to accommodate 120 children. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

Owing to leakage in the Redhill reservoir, the Castleford Urban District Council consulted Messrs. D. Balfour & Son, of Newcastle-on-Tyne and London, on the matter, who reported that in their opinion the leakage could be stopped by the construction of a new ferro-concrete bottom and lining of the walls of the reservoir. There are fissures under a portion of the reservoir, and the bottom has been designed of sufficient strength to span over any of them. The work has been let to the Yorkshire Hennebique Contracting Company.

TENDERS.

BARWELL.

For erection of Council school. Messrs. A. E. & T. Sawday, architects, Market Street, Leicester.

Richardson	£5,870 0 0
Barker & Sons	5,699 0 0
Wainer	5,608 0 0
Heath	5,515 0 0
Bowles & Son	5,460 0 0
Greaves	5,358 16 0
Woodcock & Son	5,347 0 0
Cole & Sons	5,292 0 0
Wileman & Gange	5,183 0 0
Chaplin	5,080 13 0
Hanson	5,070 0 0
Garlick	5,044 19 8
Moss & Son	5,040 0 0
Bradford	5,027 0 0
Clark & Garrett	5,015 0 0
Potter	5,007 15 0
Oldershaw	5,006 9 6
Sleath	4,985 0 0
Bradshaw Bros.	4,967 18 6
Fox, Leicester (*accepted*)	4,949 0 0

BIRMINGHAM.

For new laundry at the Birmingham workhouse, for the Guardians of the Poor of the parish of Birmingham, under the direction of Messrs. W. H. Ward, architects, Paradise Street, Birmingham.

Crowder, Birmingham (*accepted*)	£3,447 0 0

BLYTH (NORTHUMBERLAND).

For the making of Ridley Avenue, Plessey Avenue, Hedley Avenue, and Hunter Avenue, including the sewerage of the same. Mr. Robert Grieves, surveyor, Council Chambers, Blyth.

Ridley Avenue.

Henderson	£2,342 13 7
McLaren	2,340 5 2
Simpson	2,267 16 0
Robson	2,229 0 8
Coxon, Seaton Delaval (*accepted*)	1,998 18 2

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THE BATH STONE FIRMS LTD
MONK'S PARK TRADE MARK
BATH & PORTLAND QUARRY OWNERS
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ARTHUR L. GIBSON & COMPANY,
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STEEL ROLLING SHUTTERS
ALL BRITISH MADE.
Radnor Works, Strawberry Vale, Twickenham.
BURT PATENT SKYLIGHT AND VENTILATOR.

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BLYTH—*continued.*

Plessey, Hedley, and Hunter Avenues.

McLaren	1,934 1 10
Henderson	1,914 13 3
Simpson	1,895 13 8
Robson, Newcastle (*accepted*)	1,826 15 1
McLaren & Proude	1,800 19 0
Coxon	1,581 0 1

For the construction of about 500 lineal yards of 15-inch, 12-inch, and 9-inch diameter sanitary pipe sewers at Belgrave Crescent. Mr. Robert Grieves, surveyor.

Simpson	£345 1 0
Henderson	299 12 0
McLaren & Proude	252 10 0
Coxon	240 14 0
Robson, Newcastle-on-Tyne (*accepted*)	212 8 0
McLaren	208 12 0

BLETCHINGLEY.

For erecting a dining-hall, &c., at the workhouse, Bletchingley, near Redhill. Mr. G. E. Crowter, surveyor, Godstone.

Nott	£1,265 0 3
F. & G. Foster	1,241 0 0
Payne	1,233 12 0
Cooper	1,204 0 0
Quittenton	1,176 0 0
Risby & Michell	1,163 9 6
Gorham	1,160 0 0
Everitt	1,159 0 0
Wallace, jun.	1,154 0 0
Jeal	1,125 0 0
Dives	1,123 12 6
Stanford	1,087 10 7
Pink	1,084 0 0
Martin	1,053 0 0
Smith & Sons	1,037 0 0
Wright	1,030 0 0
Honour, Warlingham (*recommended*)	960 0 0

BRUMBY AND FRODINGHAM.

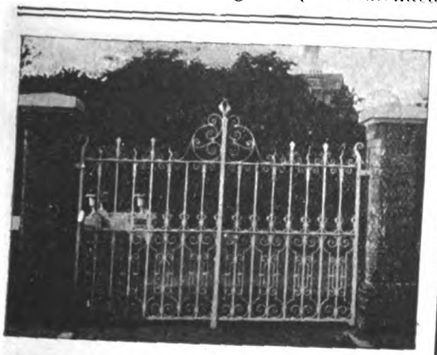
For lighting the streets by means of electricity, for the Brumby and Frodingham U.D.C. Mr. Joe Green, surveyor, Frodingham, Lincs.

Tidbury	£997 0 0
Electrical Motor Co.	529 17 6
Mansfield Engineering Co.	517 17 0
Henley	470 0 0
Trentham	413 0 0
Bradwell & Jennison	412 0 0
Dickinson & Co.	406 1 0
Laing, Wharton & Co.	397 10 0
Dewhurst Engineering Co.	395 0 0
Worcester Foundry	376 0 0
Wardle Engineering Co.	374 0 0
Hull & Matthews	369 7 0
Pullan	300 18 0
Hyde	285 5 0
Reid, Ferens & Co., Newcastle-on-Tyne (*accepted*)	278 13 6
Johnson & Philips	267 0 0
Stobart & Co.	252 3 0
Northern Electrical Co.	251 18 0

COVENTRY.

For alterations and additions to the Stanton Club, Stoney Stanton Road. Mr. H. W. Chattaway, architect, Coventry.

Anclay	£855 0 0
Matts & Cousins	845 0 0
Mottram & Son	822 11 7
Isaacs & Sons	780 5 0
Kelley & Son	774 15 9
Wincott	765 0 0
Moss & Son	765 10 0
Goode	745 0 0
Hickman	735 0 0
Lord	699 0 0
Jones & Bacon (*accepted*)	687 17 0



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Corsham Down Quarry (Entrance from Railway).

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FRED.K BRABY & Co.
FITZROY WORKS
382 to 384 EUSTON RD
LONDON.
The original introducers of the Hot Water Cylindrical Tanks.

CHITTERNE.

For erection of a house and stables, &c., at Chitterne, Wilts. Mr. W. Cecil Glass, architect, 9 The Bridge, Frome.

Curtis & Son	£666	0	0
Butcher & Son	643	12	0
Polden & Feltham, Chitterne (*recommended*)	617	8	0

DEVIZES.

For proposed house of detention at the Central Police Station, Devizes, Wilts. Mr. J. G. Powell, county surveyor.

Chivers & Sons	£853	19	0
Burton	850	0	0
Blackford & Son	805	0	0
Parsons Bros.	768	0	0
Sidery	750	0	0
Freece	750	0	0
Webb	625	0	0
Stone	515	0	0
Ash	498	0	0
Moore & Sons, Trowbridge (*accepted*)	472	0	0

DUNDEE.

For the erection of a branch library and reading-room at the corner of Foundry Lane and Blackscroft. Mr. James Thomson, city engineer, Dundee.

Accepted tenders.

Symington, mason	£2,476	0	0
Pollack, joiner	453	0	0
Farquharson & Son, plumber	162	0	0
Wishart & Son, internal fittings	162	0	0
Westwood & Son, electric installation	110	0	0
M'Ritchie, plasterer	66	0	0
Brown, slater	49	0	0
Laing, painter	32	0	0

ENFIELD.

For making up part of Clarence Road, Ponders End, for the Urban District Council. Mr. R. Collins, surveyor, Public Offices, Enfield, Middlesex.

Free & Son	£885	0	0
Griffiths	862	0	0
Inns & Co.	825	0	0
Adams	799	0	0
Knifton	789	0	0
Frost	772	0	0
Greenfield	700	0	0
Bell	695	0	0
Jennings & Grenfell	675	0	0
Betts, Enfield Wash (*accepted*)	665	0	0

HANDSWORTH.

For erecting a cart shed and raising a boundary wall at the refuse destructor works, Queen's Head Road, Staffs. Mr. H. Richardson, A.M.I.C.E., surveyor.

Turner	£370	0	0
Wood	361	3	8
Dodd, jun.	320	0	0
Bishop	295	0	0
Garfield	294	0	0
Hassall	279	0	0
Waterman, jun.	278	11	2
Morris	268	0	0
Hulbert & Ladbury	264	6	10
Auld	261	14	0
Whitehouse & Son	261	0	0
Hadley & Sons	255	0	0
G. Webb	247	0	0
Cox, Handsworth (*accepted*)	237	0	0
Crowder	237	0	0
J. Webb	237	0	0

HOLY ISLAND.

For the construction of a lifeboat house and slip, for the Royal National Lifeboat Institution. Mr. W. T. Douglass, M.Inst.C.E., engineer and architect to the Institution, 15 Victoria Street, Westminster, S.W.

Purdie	£1,268	9	4
Tulley & Sons	1,150	2	7

CHANCE BROTHERS & CO., LTD.,
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Manufacturers of
WINDOW GLASS
of all descriptions.

Sheet, Patent Plate, Plain Rolled and Rough Cast Plate, Figured Rolled, Rolled, Double Rolled and Sheet Cathedral, Muffled, "Flemish" and Coloured Glass, Old English Crown Glass and Genuine Crown Bullions, Optical, Microscopical, &c., &c.

Also of
VENTURENE WALL TILES
The new Opal Tiles of lustrous surface with clean cut edges.

SAMPLES SENT ON APPLICATION.

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HOLY ISLAND—*continued.*

Craven	1,113 19 6
Brebner & Co.	1,032 5 0
R. & A. P. Tait	996 6 0
Davidson	939 12 11
Monro & Co.	898 10 9
Darlington Construction Co., Darlington (*accepted*)	741 8 3

HIGHAM HILL.

For Higham Hill new school, to be erected on the Bulls Farm site, for the Walthamstow Education Committee. Mr. H. Prosser, M.S.A., architect. Quantities by Mr. G. T. G. Wright, F.S.I.

Roper, C.	£7,990 0 0
Stwart, J.	7,586 0 0
Webb & Co.	7,499 0 0
Shurmur & Sons	7,326 0 0
Perry & Co.	7,260 0 0
Smith & Sons	7,260 0 0
Lawrance & Sons	6,992 0 0
Lawrence & Son	6,884 0 0
B. E. Nightingale,	6,775 0 0
Brand, Pettit & Co.	6,655 0 0
H. C. Horswill	6,643 0 0
Gathercole Bros.	6,600 0 0
H. J. Carter	6,590 0 0
W. E. Davey	6,469 0 0
W. J. Maddison	6,399 0 0
J. & J. Dean	6,395 0 0
A. Monk	6,390 0 0
Hammond & Son	6,369 0 0
F. J. Coxhead	6,311 0 0
Knight & Son, Tottenham (*accepted*)	6,269 0 0
T. M. Moss	6,200 0 0
R. & E. Evans	5,987 0 0

LONDON.

For the erection of a one-storey school for infants, on the Aldersbrook school site, Ingatestone Road. Mr. C. H. Bressey, architect, 70 and 71 Bishopsgate Street Within.

Squire	£4,995 17 0
Robins	4,792 0 0
Newell & Lusty	4,656 0 0

LONDON—*continued.*

Clemens Bros.	4,544 10 0
Oram	4,526 0 0
Gladwell, jun.	4,474 0 0
J. & J. Dean	4,454 0 0
Fryer & Co.	4,318 0 0
Hyde & Co.	4,269 0 0
Foster & Son	4,267 0 0
Hammond & Miles	4,261 0 0
Joliffe	4,255 0 0
Maddison	4,197 0 0
Monk	4,180 0 0
Lawrance & Sons	4,150 0 0
Williams	4,127 0 0
Symes	4,099 0 0
Webster & Son	4,099 0 0
Jerram	4,083 0 0
Gathercole Bros.	4,062 0 0
Coxhead	3,985 0 0
Price	3,977 0 0
Fairhead & Son	3,976 0 0
F. & G. Foster	3,973 0 0
Davey, Southend-on-Sea (*accepted*)	3,926 0 0

For isolation accommodation in Temperance Ward at the Eastern Hospital, for the Metropolitan Asylums Board.

Isolation rooms.

Pasterfield & English	£2,498 0 0
Nightingale	2,180 0 0
Jeram	2,150 0 0
Brown & Son	2,167 10 0
Johnson & Co.	2,219 0 0
Roberts & Co.	2,100 0 0
Reason	2,099 0 0
W. Johnson & Co.	2,098 0 0
Willmott & Sons	2,057 0 0
Hammond & Miles	2,045 18 7
Marrable	1,987 14 7
Webster & Son	1,987 0 0
Woollaston & Co.	1,931 17 0
Fryer & Co.	1,975 0 0
F. & G. Foster, Norwood Junction (*recommended*)	1,882 0 0



WITH PATENT STOP TO PREVENT OVERWINDING.
The power can be instantly taken off while the Hinges are being fixed and afterwards adjusted to close the door conveniently. They cannot be overwound.
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NEWMAN'S NORTON SYSTEM.
MADE IN MALLEABLE IRON.
The Best Door Spring and Check for closing doors without noise.
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WITH AND WITHOUT PNEUMATIC CHECK.
Will hold door *rigidly to centre*, but diminishes in power as door is opened, allowing comfortable passage through.
The *Best* Spring to close door *against wind pressure*, and the most suitable for Banks, Schools, and other public buildings. Made in sizes to suit all doors.

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LONDON—*continued.*

For erection of new disinfector house at the North-Eastern Hospital, for the Metropolitan Asylums Board.

Smith & Sons	£547 0 0
Lawrance & Sons	375 0 0
Goodman & Sons	367 0 0
Steward	349 17 0
Kazak	328 0 0
Fryer & Co.	327 0 0
Jewell	322 0 0
Gardner & Hazell	317 0 0
Wall	315 0 0
Pike	312 0 0
Bridge, Barrett & Co.	308 0 0
Eyles	297 0 0
Hyde & Co.	275 0 0
Oram & Son, Waltham Abbey (*recommended*)	274 10 0
Engineer-in-Chief's estimate	240 0 0

For providing and fixing complete low-pressure hot-water heating apparatus at a new school in Buxton Street, Whitechapel, for the L.C.C.

Stevens & Sons	663 0 0
Wontner-Smith, Gray & Co.	630 0 0
J. & F. May	600 0 0
Grundy	587 0 0
Macintosh & Sons	581 10 0
Yetton & Co.	575 0 0
Cannon & Hefford	566 0 0
Palowkar & Sons	542 0 0
Tilley Bros.	541 10 0
Christie	532 10 0
Cannon & Sons	532 0 0
Brightside Foundry and Engineering Co.	515 0 0
Burroughes & Sons, 143 Queen Victoria Street (*recommended*)	502 0 0
Architect's (Education) estimate	570 0 0

LONDON—*continued.*

For (1) the manufacture, supply and delivery of 440,000 stoneware ducts, and (2) the laying of stoneware ducts in connection with the electrification of further portions of the Council's tramways.

Supply of stoneware ducts.

	Rate for 1,000 ducts.	Quantity.	Amount of tender (including 100*l.* for extra works).
Robert W. Blackwell & Co.	£13 13 6	440,000	£6,117 0 0
Ensor & Co.	10 5 0	440,000	4,610 0 0 (less 2½ %)
Stanley Bros., Ltd., Nuneaton (*recommended*)	9 0 0	440,000	4,060 0 0 (less 2½ % for cash monthly)
Hosea Tugby & Co.	10 4 11	250,000	2,661 9 2 (less 2½ %)
Sutton & Co.	9 17 3	222,000	2,269 15 0
Joseph Place & Sons, Ltd.†	15 0 0	100,000	1,600 0 0
Doulton & Co.	12 0 0	100,000	1,300 0 0 (less 2½ %)
Robinson & Dowler	11 0 0	100,000	1,200 0 0
H. R. Mansfield	10 4 11	100,000	1,124 11 8 (less 2½ %)

The estimate of the chief officer of tramways for 440,000 ducts is 4,800*l.*

† Not in accordance with specification.

Laying of stoneware ducts.

Brebner & Co.	50,548 6 7
Blackwell & Co.	34,055 7 7
Callender's Cable and Construction Co.	33,209 5 6
Mowlem & Co.	32,501 0 0
Dick, Kerr & Co.	31,496 18 11
Bower Bros.	31,306 16 6
Westminster Construction Co.	26,886 8 2
Reid Bros., Wharf Road, N. (*recommended*)	26,622 0 3
Chief Officer of Tramways estimate	29,750 0 0

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J. B. ORR & CO., Ltd.,

CHARLTON, LONDON, S.E.

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LONDON—*continued.*

For the provision of unclimbable iron boundary fencing at Garratt Green.

Martyn & Co.	£529 10 0
Wright	385 13 6
Buck & Co.	318 0 0
McVey & Co.	290 8 9
Faulkner & Sons	289 0 0
Hayward & Sons	287 0 0
Bayliss, Jones & Bayliss	279 1 6
Elwell	273 0 0
Hill & Smith	270 18 9
Bain & Co.	264 0 0
Palmer & Co., 5 Victoria Street, Westminster (*recommended*)	252 16 0

For the completion of the surfaces of the carriageways and footways of the roads on the Tower Garden section of the White Hart Lane estate, for the L.C.C.

Rowley Bros.	£6,137 0 0
Pedrette	5,916 13 3
Coxhead	5,687 0 0
Grounds & Newton	5,507 17 4
Bloomfield	5,115 12 0
Knifton (*recommended*)	4,838 14 8
Architect's estimate	5,500 0 0

PORTSMOUTH.

For the erection, completion and maintaining in thorough repair for six calendar months from the completion of the whole thereof, of a block of buildings for the accommodation of the staff within the grounds of the Infectious Diseases Hospital at Milton.

Salter	£2,158 15 2
Smith & Sons	2,090 0 0
Jones & Son	2,073 0 0
Buckett	1,868 11 11
Privett	1,823 0 0
Wakeham Bros.	1,822 0 0
Tanner, Southsea (*accepted*)	1,785 5 3

MILLBROOK.

For the restoration of the old church. Mr. B. D. Chancellor, architect.

Crook, Millbrook (*accepted*)	£225 0 0

PENSNETT.

For the erection of Bird's Meadow Council school.

Gough & Son, Wolverhampton (*accepted*)	£3,100 0 0

SCOTLAND.

For the reconstruction and enlargement of the lifeboat house at St. Andrews, in the County of Fife, N.B., upon a site adjoining Woodburn Street and the rocket apparatus house thereat, for the committee of management of the Royal National Lifeboat Institution. Mr. W. F. Douglass, M.I.C.E., architect and engineer, 15 Victoria Street, Westminster, S.W.

Brebner & Co.	£898 14 0
Exors. of J. Arundel	827 15 6
Spence	819 10 10
A. & J. Carstairs	810 0 0
Thom	797 16 9
Ritchie & Son, St. Andrews (*accepted*)	783 19 7

SCARTHO.

For the erection of an elementary school at Scartho, Lincs. Messrs. Scorer & Gamble, architects, Lincoln.

Hill	£1,430 0 0
Wright & Son	1,258 10 0
Marrows	1,212 0 0
H. & E. Smith	1,179 0 0
Allison	1,154 0 3
Holmes & Richardson	1,149 10 0
Hewins & Goodhand	1,145 0 0
Hollingsworth Bros.	1,125 12 0
Kirton	1,124 16 7
Salmon & Co., Cudworth, Barnsley (*accepted*)	1,077 0 0
Mawer Bros.	1,217 8 0

THE "TILT" FIRE.

WITH THE "TILT" FIRE YOU CANNOT FAIL TO GET A BRIGHT FIRE IN A FEW MINUTES.



The tilting arrangement is so simple that there is nothing to get out of order. No other hearth fire has such advantages. Many hundreds already sold.

POINTS:—Clean Hearth.
Quick or Slow Combustion.
Saving of Fuel.
Cure for Smoky Chimneys.

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Write for Full Particulars and New Designs.

THE

Coalbrookdale Co., Ltd.,

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Works:
The Coalbrookdale Co., Ltd., Coalbrookdale, R.S.O., Shropshire.

Bristol Showroom: West India House, Welsh Back.

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WALES.

For erection of sixty houses, more or less, at Ebbw Vale (Mon.), for the Trustees of the Willow Town Building Club. Mr. T. E. Rogers, architect, Waunllwyd, Mon.

Davies & Sons	£13,524	0	0
Wilcox	12,902	0	0
Casewell	12,694	10	0
Davies	11,946	0	0
Rowlands & Davies	11,842	0	0
Casewell	11,794	0	0
Williams & Sons	11,652	0	0
Watkins	11,316	0	0
Ebbw Valley Building Co.	11,304	0	0
Garland	10,096	0	0
Architect's estimate	11,252	0	0

For alterations and repairs to the Welsh Congregational Chapel, Porth. Mr. W. D. Thomas, architect, Porth.

Isaac	£435	0	0
Jenkins & Sons	420	0	0
Hallett, Cardiff (*accepted*)	340	0	0

WINCHESTER.

For painting the workhouse, &c., for the Guardians.

Jelly	£262	17	0
Wise	260	0	0
Moreton & Sons	225	0	0
Fielder & Son	180	0	0
Avery Bros. (*accepted*)	165	0	0

WORDSLEY.

For erection of Lawnswood Road Council school.

Gough & Son, Wolverhampton (*accepted*)	£3,750	0	0

The Heston and Isleworth District Council is about to start an experiment in training municipal officials by means of pupilships open to local youths by competitive examination. Three pupilships will be available in each of the departments of the clerk, the surveyor, the medical officer, and the electrical engineer. The boys will be trained for five years, receiving a salary of 26*l*., and 39*l*. in the last two years. The system of allowing premium pupils will cease.

TRADE NOTES.

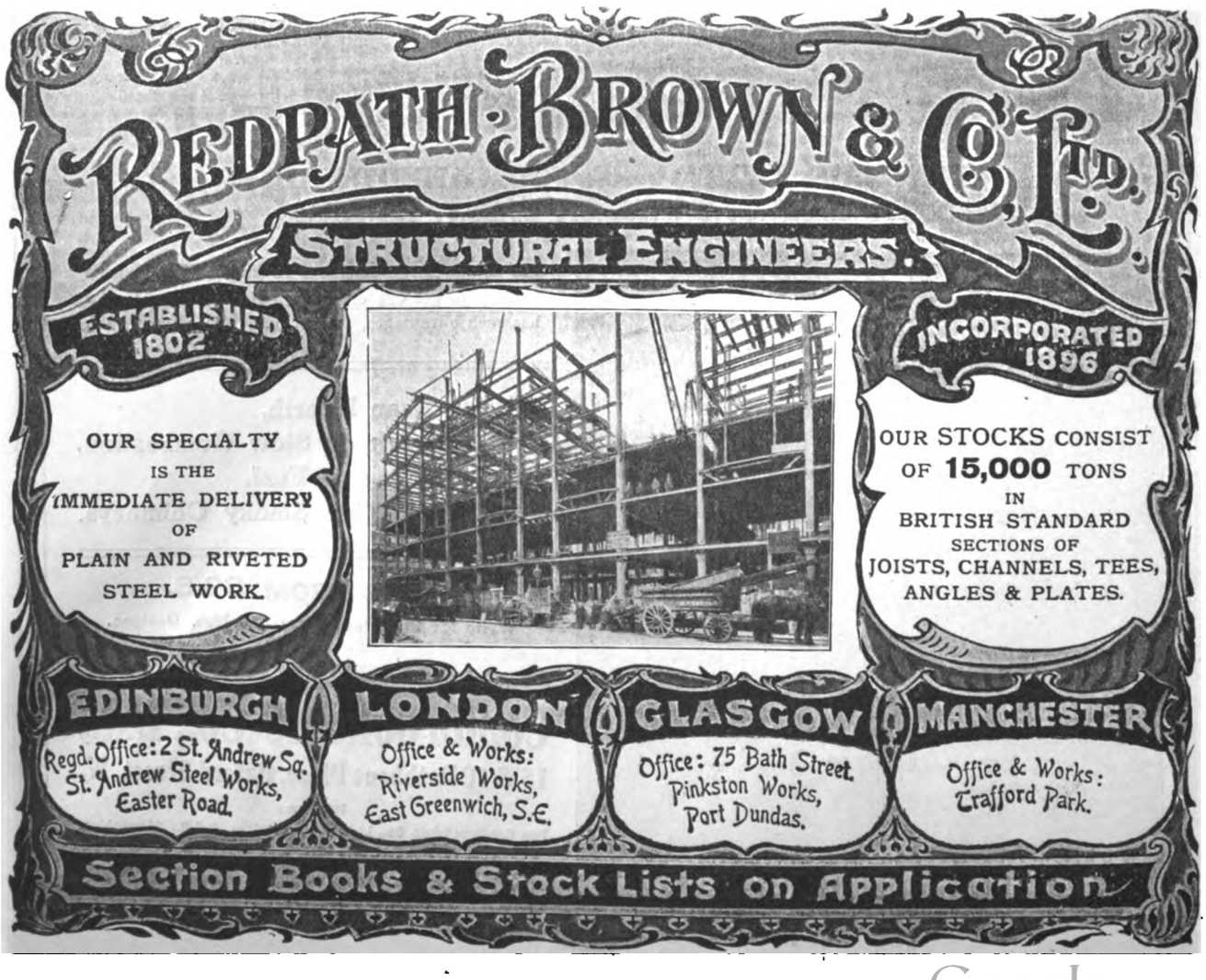
Messrs. Arthur L. Gibson & Co., Radnor Works, Twickenham, inform us their Kinnear patent steel rolling shutters were used in the fire-prevention improvements carried out at the Mansion House, London, E.C. These shutters were introduced in some of the most important openings, including the large one between the Egyptian Hall and the Saloon.

Messrs. E. H. Shorland & Brother, of Manchester, have recently supplied their warm-air ventilating patent Manchester grates to the Somerset and Bath Asylum, Wells. Among other work being carried out by the firm is the following:—The Empire Skating Rink, Warrington, is being ventilated by means of Shorland's patent exhaust roof ventilators; the extensions to the Croydon Union workhouse are being warmed and ventilated by means of Shorland's patent Manchester grates; and the Stewkley schools, Bucks, are being warmed and ventilated by means of Shorland's patent Manchester stoves.

Messrs. J. G. Childs & Co., Ltd., electric and hydraulic engineers, Willesden Green, N.W., have just obtained an order from the War Office for three lifts for the Royal Army Clothing Factory at Pimlico; and also another order from the London, Brighton and South Coast Railway for a crane for Brighton, making the third supplied this year.

The Painters' Company give notice that they will meet on December 8 to elect pensioners in connection with the Charities to Aged Blind Men and Women. Particulars may be obtained of Mr. T. H. Pritchard and Mr. F. W. Englefield, clerks, Painters' Hall, Little Trinity Lane.

The Plymouth Corporation land committee have been considering the need for the renovation of the interior of the Guildhall, and recommend that the borough surveyor should proceed with the pointing of the walls and other external work to prevent damp finding its way into the interior, and also that schemes, estimates and specifications for the redecoration of the interior of the Guildhall should be invited from art decorators, with a view to the cost being included in the estimates for the next financial year.



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ILLUSTRATIONS.

SELBY ABBEY.—SOUTH-WEST VIEW—SOUTH-EAST VIEW—SOUTH SIDE—TOWER AND NORTH TRANSEPT.

COTTAGES AT BEACONSFIELD, BUCKS.

LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.—DETAIL FROM TRINITY COLLEGE, CAMBRIDGE.

BUILDING AND BUILDERS.

Mr. R. G. Cowe, architect, Chester-le-Street, is preparing plans for a theatre to be erected in Chester-le-Street.

Mr. Charles Dorman, one of the directors of Messrs. Dorman, Long & Co., ironmasters, has been adopted as the Unionist candidate for Middlesbrough at the next election.

The East and West Molesey Urban Council have agreed to the expenditure of 4,165*l.* on the erection and equipment of an isolation hospital.

The Court of Common Council have agreed to the expenditure of 8,500*l.* in the provision of chill-rooms at the Metropolitan Cattle Market.

The borough surveyor at Wrexham has been instructed to prepare a plan and estimate of the cost of a lodge proposed to be erected at the new park and of designs for fencing and entrance gates.

Mr. Frank Freeman, architect, Bolton, is preparing plans for a parish church to be erected at Abram, near Wigan. Mr. Freeman was architect for the church of Holy Trinity, Failsworth, which was consecrated recently by the Bishop of Manchester.

The finance committee of the Exeter City Council recommend that application be made to borrow 2,116*l.*, the cost of enlargement and adaptation of the disused school premises in Cowick Street, for the purposes of an elementary school for infants and junior girls

The building by-laws sub-committee of the Portsmouth Town Council have completed the work of revision, and it was decided on Tuesday to forward the amended Act to the Local Government Board for confirmation. A local association of speculative builders has been formed to protect the interests of the speculative builders and to protest against the statements made recently by members of the Council relative to the quality of work put in speculative houses.

At Falkirk Dean of Guild Court last week warrants were granted for the erection of property worth several thousand pounds. The Olympia (Falkirk), Ltd., had plans approved of a skating rink to be built in Hope Street at a cost of between 3,000*l.* and 4,000*l.* In addition plans were passed by the Court for a public-house in High Street, as well as villa residences and cottages in various parts of the town.

The action of the Derby education committee in inviting tenders "from Derby firms only," for the erection of the new school on the Kedleston Road site, has not met with the approval of the district auditor, who, in his report, expresses the opinion that the best interests of the ratepayers as a body are not served by tenders being thus restricted.

The buildings committee of the First District of Renfrew, N.B., have during the five weeks ending October 11 granted linings of the total value of 35,860*l.*, as compared with 16,050*l.* for the corresponding period of last year. Among the plans lodged were the following:—Terrace of sixteen cottages in proposed street on Braidbar Estate, Giffnock, for Messrs. Robertson & Gow, 175 West George Street, Glasgow; terrace of eight cottages in Mossgeil Road, Newlands, for Messrs. George Eadie & Sons, 405 Mathieson Street, Glasgow; four double villas in proposed new street at Giffnock, for John Taylor, Eddlehurst, Larkhall.

VARIETIES.

The Widnes Town Council have instructed the borough engineer to prepare plans and estimates for the erection of an electric lighting station, with a view to the possible adoption of a municipal supply. The Council have been negotiating with a local company for a public supply.

The Glasgow Corporation sub-committee on air purification have had before them a report prepared by the sanitary inspector, the gas engineer and the Corporation chemist on the effect which the more general use in dwelling-houses of gas stoves for cooking purposes would have on the atmosphere. It is to be considered at a future meeting.

The Nottingham Corporation have adopted a resolution by which the general purposes committee, and all other com-

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mittees concerned, will have to limit the proposed widening of Carrington Street to a total width of 70 feet, instead of 80 feet as agreed upon. This alteration will effect a saving of 7,000*l.* The total cost will be 35,000*l.*

The Co-Partnership Tenants, Ltd., have after prolonged negotiations secured some 1,500 acres of ground between Wavertree and Childwall, near Liverpool, for the purpose of forming another garden city capable of accommodating 40,000 people. Another scheme is for the erection of about 260 houses in a garden city to be erected at Bromborough Port, Cheshire.

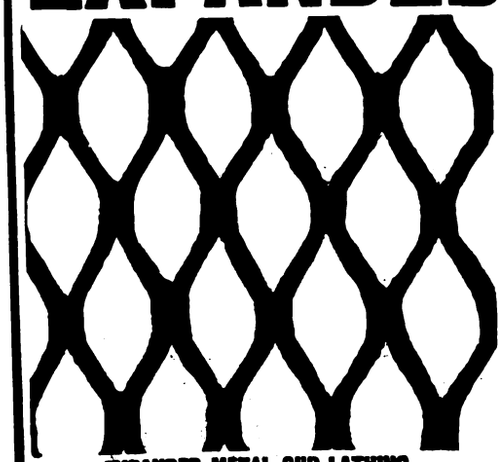
The attendances at the Exhibition of Cottage Designs organised by the Council of the Royal Manchester Institution in June have been very satisfactory—more than 24,000 persons at the City Art Gallery during five weeks and 29,000 persons at the Queen's Park Branch Gallery during six weeks. The designs have been removed to the Art Museum in Ancoats, where they will remain on view until the middle of November.

Mr. R. J. Lovell, architect, 46 Queen Victoria Street, London, E.C., has prepared a scheme for the Aviators Finance, Ltd., a London syndicate, for a great international aviation centre at Lancing, near Brighton. The scheme comprises an extensive club building, stands to accommodate between 10,000 and 20,000 people, a golf club house, sheds for the flying machines, and all other necessary buildings. The project is supported by the Mayors of Hove, Worthing and Brighton and the London, Brighton and South Coast Railway Company.

The Council of the Institution of Civil Engineers have made the following awards for the year 1908-9:—Telford gold medals to Professor B. Hopkinson, M.A., B.Sc. (Cambridge), and Mr. G. R. G. Conway (Monterrey, Mexico); Watt gold medals to Messrs. D. A. Matheson (Glasgow) and W. C. Popplewell, M.Sc. (Stockport); George Stephenson gold medals to Messrs. E. H. Tabor (London) and A. J. Knowles, B.A. (Cairo); the "Indian" premium and a Telford premium to Mr. T. R. Nolan, B.E. (India); Telford premiums to Messrs. S. J. Reed (Newcastle), C. T. Purdy (New York), L. A. B. Wade (Sydney), G. Hobbs (Accra, West Africa), W. Cleaver (Port Talbot), J. D. W. Ball (London), Professor A. H. Gibson, D.Sc. (Dundee), and R. D. Gwyther, M.Sc. (Buenos Aires); the "James Forrest" medal and a Miller prize to Mr. J. A. Wotherspoon (Glasgow); the Miller scholarship to Mr. J. A. Orrell (Manchester); the "James Prescott Joule" medal and Miller prizes to Messrs. W. E. Fisher and E. B. Wood (London); Miller prizes to Messrs. W. E. R. Gurney (London), E. G. L. Lovegrove (London), J. Purser (Birmingham), G. C. Minnitt (Manchester), S. F. Deacon (Manchester), C. H. Bradley and A. E. Marshall (Birmingham).

The Labour Department of the Board of Trade have issued a report dealing with the changes in rates of wages and hours of labour in the United Kingdom in 1908. So far as could be ascertained over 963,000 workpeople (changes affecting agricultural labourers, seamen, and railway servants are not included) had their rates of wages changed during the year. Of these 119,000 received advances amounting to over 7,200*l.* per week, and 464,000 sustained decreases amounting to 66,400*l.* per week, whilst the remaining 380,000 workpeople had upward and downward changes which left their wages at the same level at the end as at the beginning of the year. The net result of all the changes was therefore a decrease of 59,200*l.* per week. Of the 119,000 workpeople whose wages were increased, 9,000 were employed in the building trades. As compared with the number of workpeople affected by changes in rates of wages, the number whose recognised hours of labour were changed in 1908 was small. It will be understood that the changes recorded do not include temporary alterations in the working hours owing to changes in the state of trade or regularly recurring seasonal alterations as in the building trades. The changes reported affected 26,541 workpeople, of whom 3,349 had their aggregate working time increased by 5,686 hours per week, and 23,192 had reductions amounting to 44,109 per week. The net effect of all the changes was thus a reduction of 38,423 hours in the weekly working time of the people affected. The changes in rates of wages taking effect in the first six months of 1909 showed that the downward movement in wages which commenced in 1908 was still maintained. In every group of trades, with the exception of clothing, printing, and employees of local authorities, the changes resulted in net decreases, the net amount of valuation being 67,744*l.* per week.

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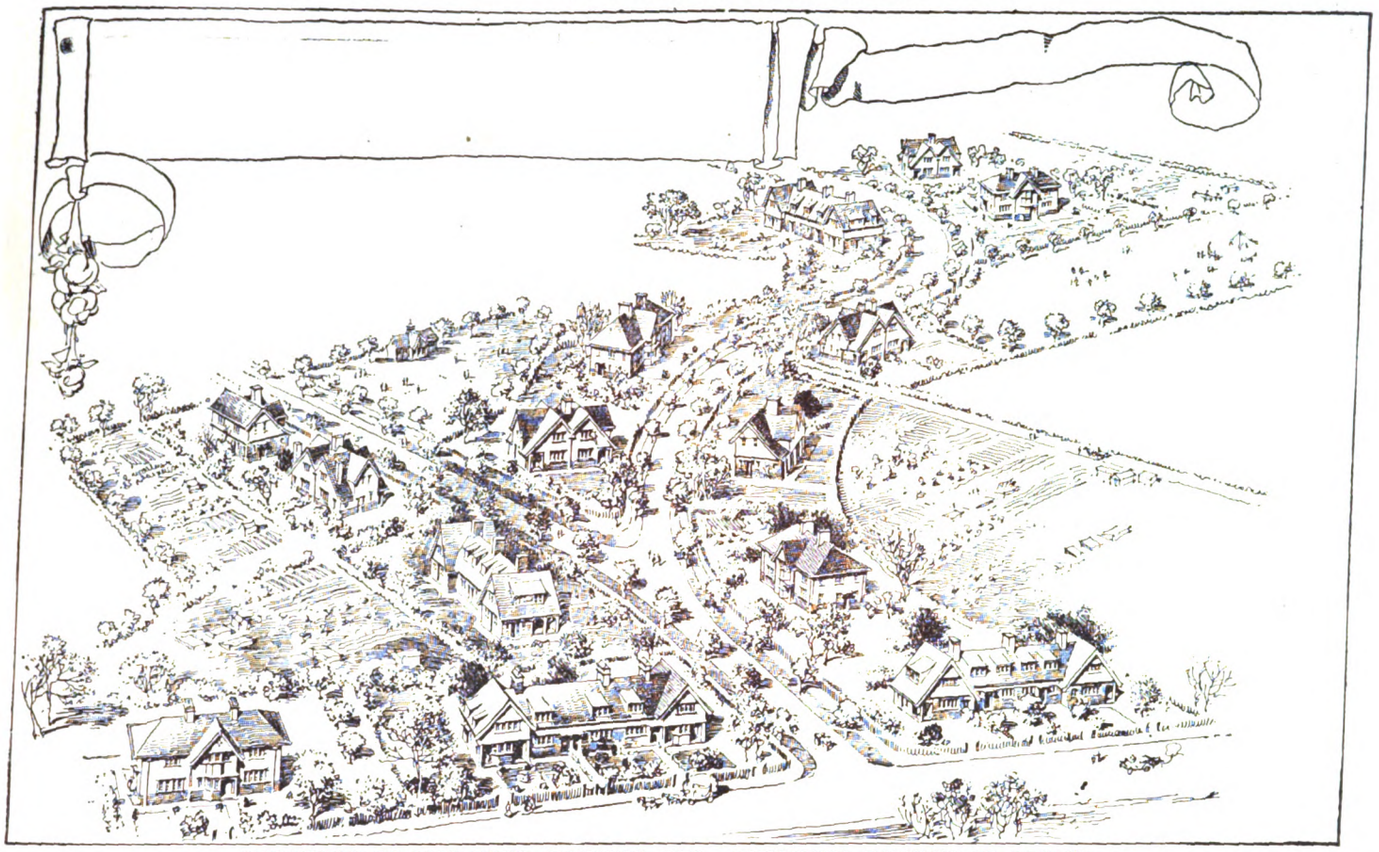
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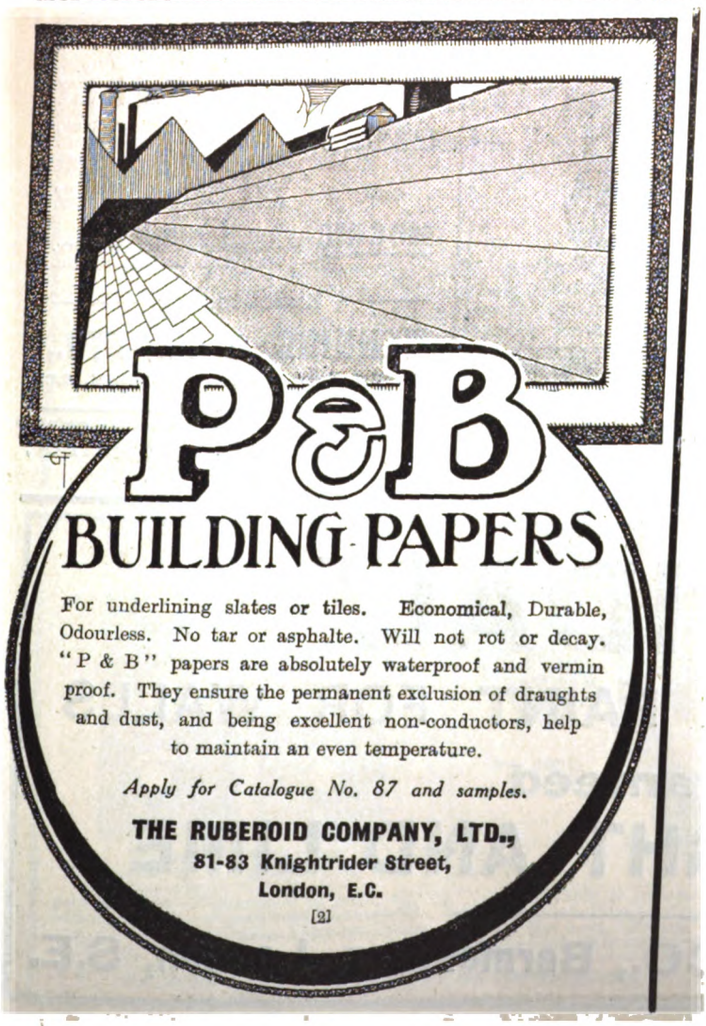
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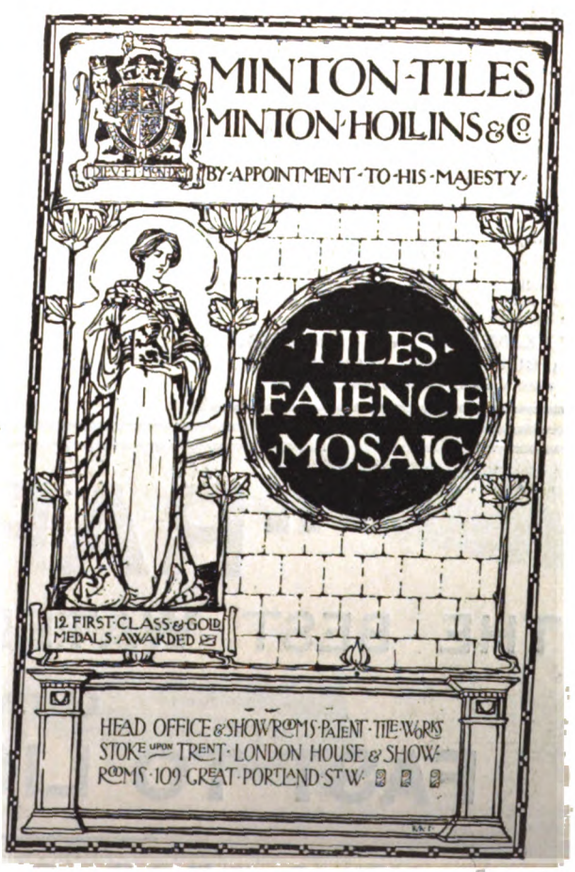
HEREFORD GARDEN CITY.



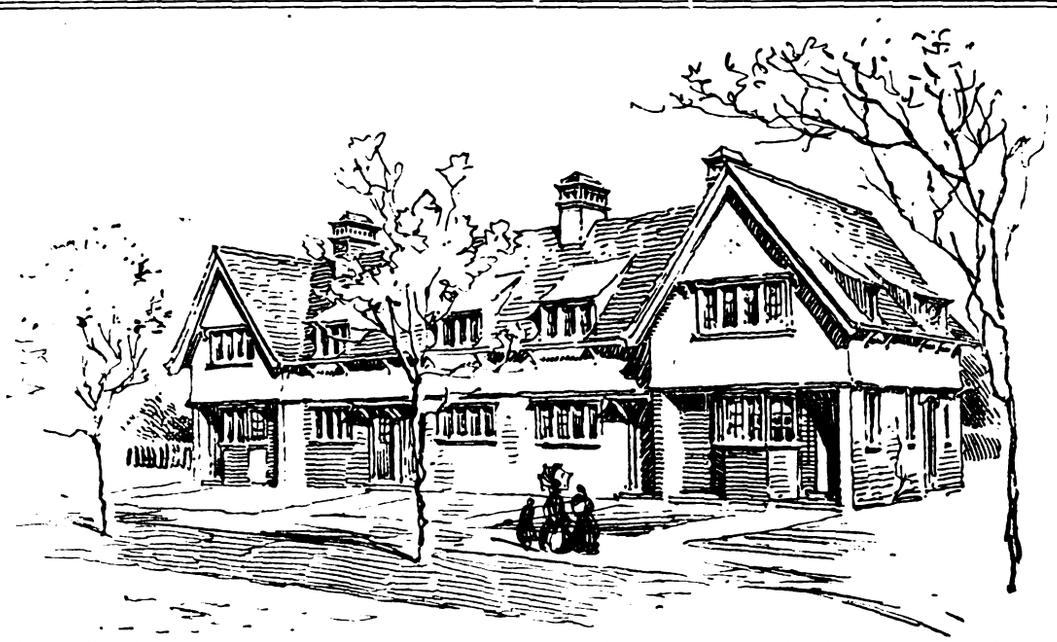
HEREFORD CO-OPERATIVE HOUSING, LTD.—SOUTHERN PORTION OF ESTATE.
MESSRS. GROOME & BETTINGTON, Architects, Hereford.

FOR several years the medical officer of health and inspector of nuisances at Hereford reported to the Council that much of the cottage property in the city was in so bad a state of repair that it could not be reasonably rendered habitable; and that more and better cottage accommodation was urgently required. On the instructions of the sanitary com-





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Block of Five Cottages, each containing on ground floor—Living Room, Kitchen, Larder, Coal Store and W.C., and on first floor Three Bedrooms. The end Cottages are larger, and one has Bath (with hot and cold). Rent of this, including rates and taxes, 5*s.* 9*d.*; other end Cottage, 5*s.* 6*d.*; intermediate Cottages, 4*s.* 9*d.*

mittee a systematic inspection of insanitary properties in the city was carried out a couple of years ago, and the reports showed that, of the houses visited, 156 were in so bad a condition that they should be closed for human habitation. The city surveyor also inspected the properties, and he stated that 75 per cent. of them were past repair, and that the greater number of the remainder were in such a bad state of repair that it would be unprofitable to make them habitable. From inquiries made, the Council were satisfied that there was an undoubted scarcity of cottages in the city at rents within the means of unskilled labourers, and it was ascertained that in February 1908 only one cottage below the rent of 5*s.* per week was then vacant. The Council were hampered in their efforts to obtain the closing of insanitary premises by reason of there being no accommodation for the displaced tenants, and on that account, except where absolutely necessary, took no proceedings with regard thereto. With the view of the provision of such accommodation and to effect the closing of the houses reported as unfit for human habitation, the Council agreed with Sir Edward Hopton, K.C.B., to purchase for the sum of 1,500*l.* a site comprising 9 acres, 1 rood, 6 poles of land, situate near the Barr's Court

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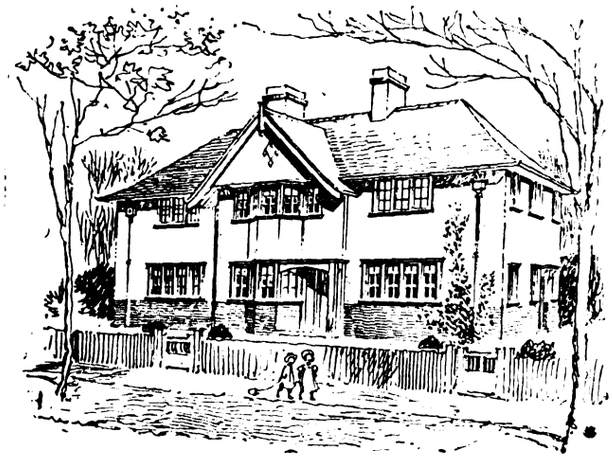
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Semi-detached: Each Cottage containing on ground floor—Living Room, Kitchen, Larder, Coal Store and W.C., and on first floor Three Bedrooms. Rent per Cottage, including rates and taxes, 6*s.*

railway station in the city. This land is highly suitable for the erection of workmen's dwellings, being within easy reach of the majority of the industrial businesses of the city, and having a large frontage to an existing road.

To meet the new condition the society known as the Hereford Co-operative Housing, Ltd., was established. The committee obtained an option to purchase, or lease with an option of purchase, this land other than the roads (or so much of it as the capital raised will permit the use of) at such a price as would recoup the Corporation their outlay in connection with it. It is not intended that the houses to be erected will be occupied by the tenants from the condemned houses. Accommodation for them is expected to be found in the houses vacated by those who will become the Co-operative tenants.

The capital consists of ordinary shares paying a dividend of not more than 5 per cent., and loan stock paying 4 per cent. The loan stock has priority to the ordinary shares, and is transferable, but not withdrawable. But the Society reserves the right to repay the whole or any part (to be chosen by lot) at par, on giving six months' notice. The ordinary shares are 1*l.* each, payable not less than 1*s.* on allotment. No member may hold more than 200*l.* ordinary shares. The loan stock shares are 5*l.*, payable not less than 5*s.* on allotment. A member may hold an unlimited amount of loan stock, but only ordinary shares confer votes. Any surplus profit, after paying dividends not exceeding the above and providing for repairs, depreciation, &c., is divided among the tenant members in the shape of shares, the non-tenant investing members being gradually paid out. The tenant members have thus a direct interest in improving the investors' security by taking care of their houses and introducing good tenants. The tenant members' share capital also affords a security for the rent.

The Hereford Co-operative scheme is one of the latest examples of what can be done to satisfactorily and eco-

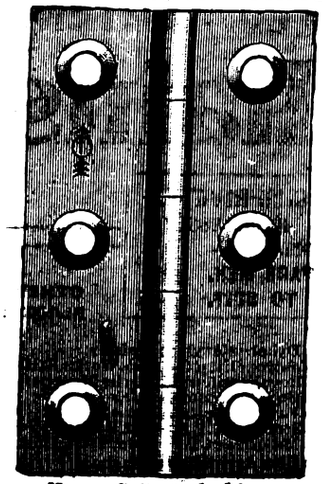
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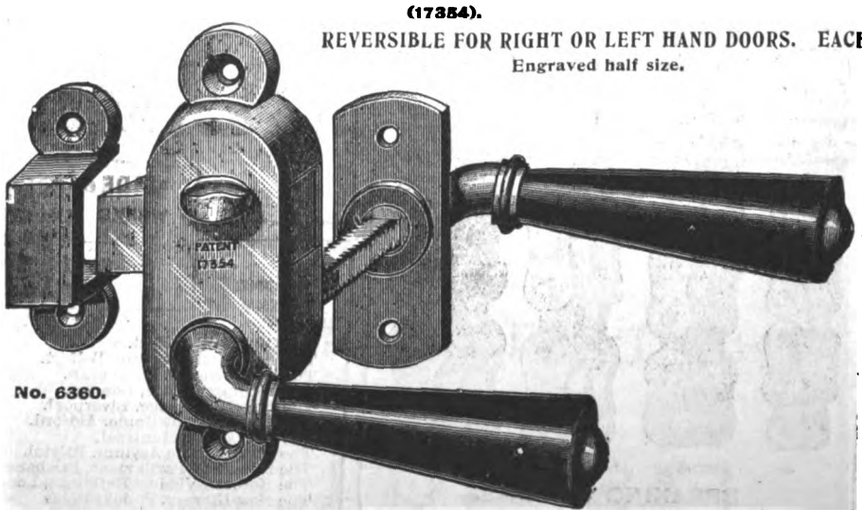
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nomically solve the problem of housing the working classes. One of the features of the Hereford scheme is the studied irregular distribution of the cottages upon the site. In the Hereford scheme the roads are designed upon Continental lines, the road itself being edged each side with a 7 feet 6 inches wide strip of turf, and along the other side of these breaks of greensward comes the 5-foot wide footpath. On no part of the estate are there more than twelve houses per acre. The cottages themselves are set back 15 feet from the edge of the footpath; there is therefore a total width of 70 feet from houses on one side of the road to houses on the other side. The cottages are models of economical planning, and are most picturesque and cosy in appearance, the architectural style being reminiscent of the Old English cottage, but the walls being cement rough-cast and the roofs covered with Broseley tiles. All the rooms are plastered and papered. Some have a good-sized parlour and upstairs bathroom, whilst all have a commodious kitchen and scullery and a direct lighted and ventilated larder. There is an absence of the usual outbuildings at the back. This difficulty is got over in an ingenious manner, the w.c.'s and coal stores being dovetailed into, without apparently encroaching upon, the main block of the cottage; both w.c. and coal store being in some cases entered from outside, whilst in other cases a clever arrangement is provided for additional access to the coals from the scullery, without going outside, in the wet weather for instance. Another ingenious feature to be found in some of the cottages is Corne's patent combined range and wash boiler; the bath in these cottages being in the scullery, and when not in use is covered with a folding table-top. The rents of the cottages built at present are 4*s*. 9*d*., 5*s*. 3*d*., 5*s*. 6*d*., 5*s*. 9*d*., 6*s*., and 7*s*. 9*d*. (all include rates and taxes). It should be stated that the idea of the committee is to suit the pockets of the working men earning 15*s*. to 1*l*. per week and from 25*s*. to 30*s*. per week. The drawings of the Hereford scheme have recently been on view at the Manchester Art Gallery, the Queen's Park Art Gallery, and the Manchester Art Museum. Messrs. Groome & Bettington, the architects to the scheme, have since been requested by the Corporation of Bury to loan them the drawings for an exhibition which this body are holding with a view to promoting a housing scheme in that township.

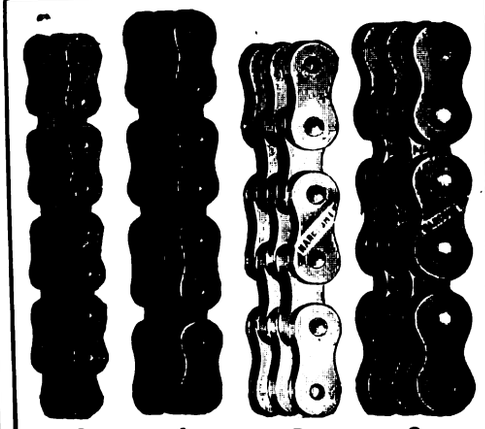
THE WIDENING OF FLEET STREET.

On Tuesday last the London County Council agreed to the contribution of 200,000*l*. towards the scheme of the City Corporation for completing the improvement of Fleet Street. The Council has on various dates since 1896 agreed to contribute half the cost of widenings of Fleet Street proposed by the Corporation. The total cost of these widenings was estimated at 270,174*l*., and the contributions agreed to by the Council are therefore estimated to amount to 135,087*l*. The general width adopted for the widened road was 60 feet. The Corporation has now prepared a scheme for widening the remainder of the road to 60 feet except at those parts where the width is only a little less than this and, subject to the Council contributing half the cost, it has decided to proceed with the improvement. The road at present has a minimum width of only 48 feet 6 inches. A deputation from the improvements and finance committee of the Corporation strongly urged that the Council may be recommended to make the desired contribution. The deputation pointed out that, as the premises which have been acquired and set back to the new frontage are recessed, they are difficult to let, and that loss of trade and loss of rates are thus caused. On the other hand the value of property in Fleet Street is, in general, rapidly increasing, so that the longer the execution of the improvement is deferred the more costly will it prove. The rateable value of property in the City which in 1858 was 1,250,000*l*. had increased in 1896, when the first widenings of Fleet Street to 60 feet were undertaken, to 4,423,000*l*., and in 1908 to 5,470,000*l*. Delay would also afford opportunities for the creation of fresh interests, particularly in the property which is let on lease. The acquisition of these interests would entail additional heavy expenditure. A great part of the property needed is occupied by the freeholders and has, in most cases, been rebuilt comparatively recently. No favourable opportunity for dealing with this property is likely to occur for many years. The deputation considered that an application to Parliament for special powers for the compulsory acquisition of property would lead to unnecessary delay and that it would be more economical for the Corporation to proceed under its existing compulsory powers.

The cost of the improvement was originally estimated by the Corporation at 500,000*l*., but the London County Council

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improvements committee are informed that, owing to the omission of certain properties, it now estimates the cost at 415,600*l.* The valuer is of opinion that the cost of the widening should not exceed 400,000*l.* It is the usual practice of the Council to base its contributions towards the cost of local improvements on estimates prepared by its officers and approved by us. The committee have approved the estimate of 400,000*l.* and they think that any contribution should be based thereon. The Council, by its contributions in past years, has fully recognised the importance of the thoroughfare and the necessity for widening it. The improvements committee are strongly of opinion that the Council should now co-operate with the Corporation in completing the improvement, in order that the present congestion of traffic may be relieved, and that full benefit may be derived from the widenings already executed. The deputation suggested that the Council's total payments in any one year in respect of the improvement should not exceed 50,000*l.* The Corporation has since stated that it desires, as far as possible, to consult the convenience of the Council as to the payment of its contribution, and it suggests August 1, 1910, for the payment of the first instalment. On this basis the contribution would be spread equally over the four financial years, 1910-11, 1911-12, 1912-13 and 1913-14.

The improvements committee recommended:—

(*a*) That the estimate of expenditure on capital account of 200,000*l.*, submitted by the finance committee in respect of the widening of Fleet Street at Nos. 13, 14, 15, 16, 21, 22, 47, 49, 50, 52, 54, 55, 55A, 57, 58, 60, 61, 62, 68, 70, 72, 73, 74, 75, 77, 78, 80 and 81, be approved as an estimate of costs, debt or liability under section 80 (3) of the Local Government Act, 1888.

(*b*) That expenditure on capital account not exceeding 200,000*l.* be sanctioned in respect of the widening of Fleet Street as specified in resolution (*a*); that a contribution be made, on the usual conditions, of one-half of the net cost of the widening, provided (i.) that, if the total net cost exceed 400,000*l.*, such contribution shall be limited to 200,000*l.*; (ii.) that, in the execution of the improvement, no departure whatever be made from the approved plan, except with the previous sanction of the Council; and (iii.) that the total amount to be paid by the Council in any one year be limited to 50,000*l.*

These recommendations were discussed at the meeting of the County Council on Tuesday, and were adopted by a majority.

The finance committee submitted a report at the same time in which they expressed the opinion that provided proper provision is made in the annual estimates, and provided also that the expenditure on the improvement incurred by the City proceeds at approximately the same rate proportionately, *i.e.*, about 100,000*l.* a year at least, they saw no objection, from a financial point of view, to the adoption of the City Corporation's suggestion if the Council agrees to the improvement being carried out.

The following information was given as to the present position of the Council in regard to its capital commitments in respect of street improvements generally. The proportions chargeable against the tramways account are included:—Commitments as on September 30, 1909, on estimates of costs, debt or liability approved to date, including balances of contributions promised to the City amounting to 379,316*l.*, of which 14,518*l.* is in respect of Fleet Street widenings most of which will be absorbed by the present proposal—approximately 1,900,000*l.* Commitments attendant upon legislation of 1909, in respect of which estimates have not yet been put forward (including Woolwich footway tunnel), 145,000*l.*; total, 2,045,000*l.*

LONDON MASTER BUILDERS' ASSOCIATION.

A SPECIAL general meeting of the London Master Builders' Association was held on Thursday, October 21, for the purpose of making amendments in the rules of the Association.

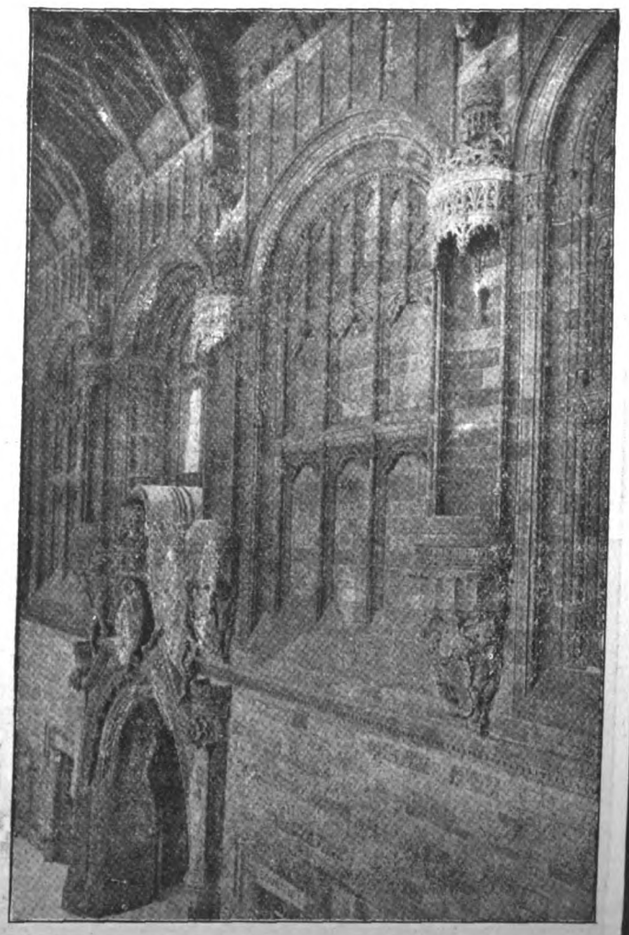
Mr. F. G. Rice (President) occupied the chair, and explained that with a view to enlarge the sphere and usefulness of the Association the Council had decided to obtain the necessary authority to alter that portion of Rule 3 which relates to the subscription of Associate members. He said, in the course of his remarks, that it has long been felt that many merchants were desirous of being identified with and assisting the work of this Association, and the object of altering the rule was to give them an opportunity of showing their practical sympathy with its work. The President then formally moved:—

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(*a*) That Rule 3 be altered to read:—"Associate members shall pay an annual subscription of 2*l.* 2*s.*"

(*b*) Rule III., section *b*. To add:—"Other things being equal, preference in ordering goods shall be given to builders' merchants who are Associate members."

This was seconded by Mr. F. Higgs, chairman of the organisation committee, and who gave a most interesting account of the work of that committee, explaining that they had devoted much care and thought in their endeavours to extend the Association; and he hoped that present and future members as well as the trade generally would keep constantly in mind the importance of loyal cohesion in their efforts to protect themselves from the various dangers to which the trade is subject. He felt sure that a considerable number of merchants would enrol themselves as Associate members, and he fully explained the scheme of issuing a telephone card containing the names of builders' merchants who will become Associate members for the use of the ordinary members of the Association.

An interesting discussion, in which Messrs. J. Chessum, J. W. Lorden, R. J. Worsley and others took part, followed, and the resolutions were carried unanimously.

The President made an earnest appeal to all present to use their best endeavours to further the work of the Association, and the proceedings terminated.

A Council meeting was held on the same day, when Mr. F. G. Rice (President) presided.

A hearty vote of thanks was given to Mr. Rice and the members of the sub-committee, Messrs. Brown, Higgs and Wallis, for the successful reception of and dinner to the Belgian master builders who visited London in August last.

The organisation committee's report was adopted, and the references from the special general meeting respecting the alterations in the rules were received.

The Council also made such additions to the pamphlet, entitled "The Objects of the Association," as recent times and current events demanded, and much satisfaction was expressed to Mr. F. Higgs for his able and suitable amendments of and additions to the old pamphlet. Proofs were ordered to be printed and laid before the Council at their next meeting for further consideration and adoption.

The President reported the proceedings of the conference held on the 13th inst., and submitted three resolutions passed on the occasion respecting tendering without quantities. The conference was promoted by the Quantity Surveyors' Association, and was attended by representatives of the Institute of Builders, the National Federation, and this Association. The Council felt that the subject discussed was a most important one and ordered that copies of the resolutions should be sent to each member of the Council, and that the matter be further considered at their next meeting.

The resolutions referred to were as follows:—

1. That the Conference disapproves of the practice of asking for tenders in competition for works of a substantial value without quantities, prepared by a fully qualified quantity surveyor, being supplied, and is of opinion that such quantities should be supplied in all cases when competitive estimates are invited for works expected to cost 500*l.* and upwards.

2. That the Conference recommends the Councils of the Institute of Builders, the London Master Builders' Association, and of the National Federation of Building Trades Employers to urge their members to refuse to tender in competition without quantities for works costing 500*l.* and upwards.

3. That a copy of the first resolution be sent to the Royal Institute of British Architects, the Society of Architects, and the Surveyors' Institution.

Two cases involving interesting trade questions referred to the solicitor were reported upon and spoken to by him and the Council, and instructions given.

The request frequently made of requiring priced schedules to be submitted with tenders was discussed, and the Council wishes to approach various bodies by deputation to discuss this question.

The amended national agreement with the N.A.O.P. was submitted, and the National Federation was asked that the correspondence showing that the amended agreement does not supersede the arrangements made in the working rule agreement between the London Plasterers and the L.M.B.A. should be printed and bound up with the intended issue of these new rules.

Various trade questions were discussed, and the Council adjourned after a very lengthy sitting.

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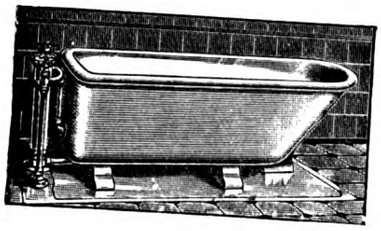
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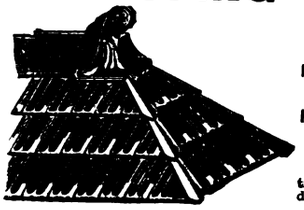
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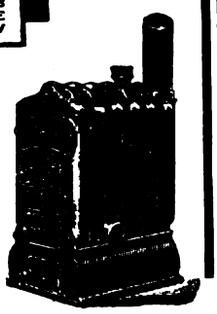
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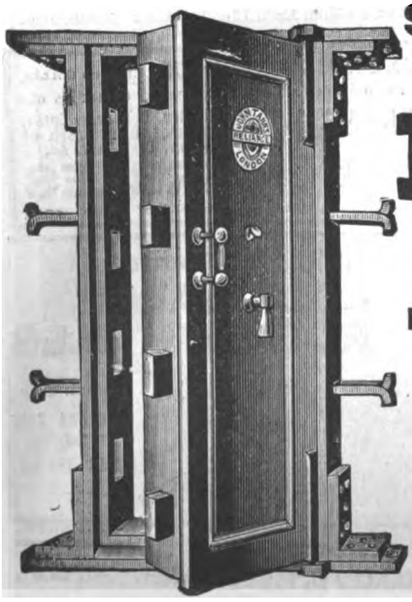
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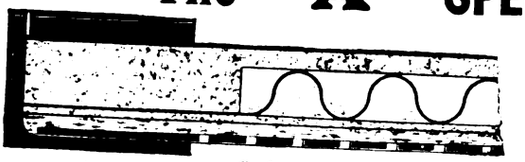
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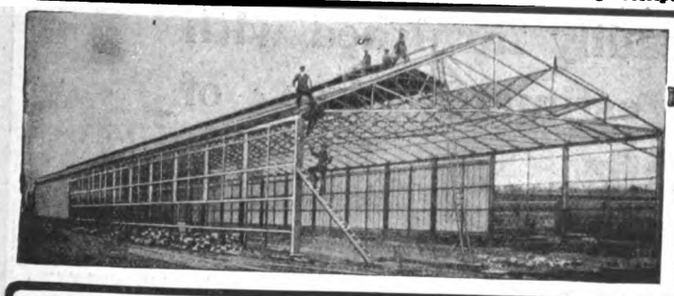
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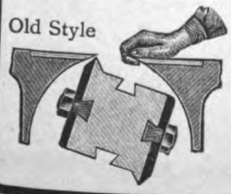
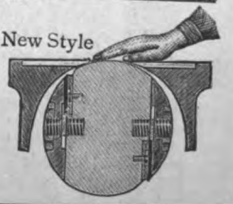
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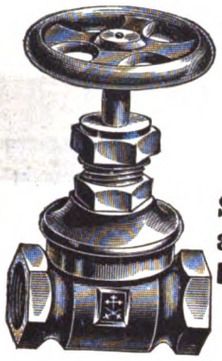
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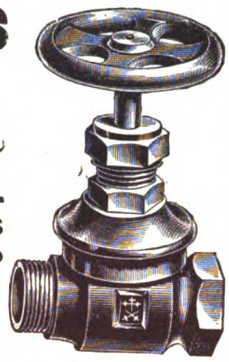
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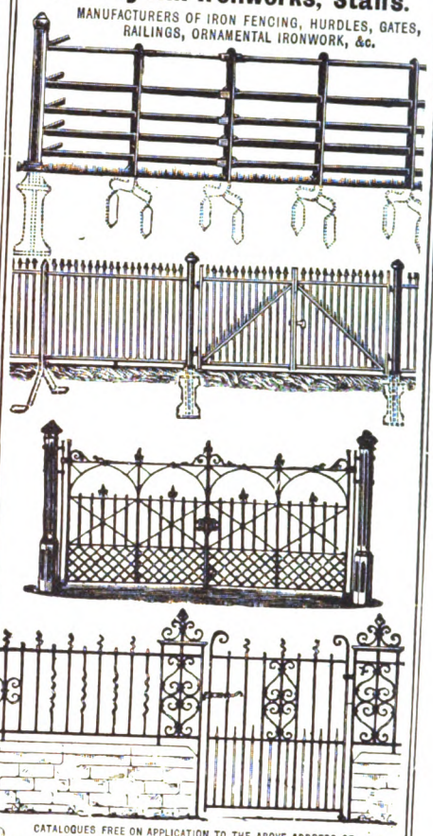
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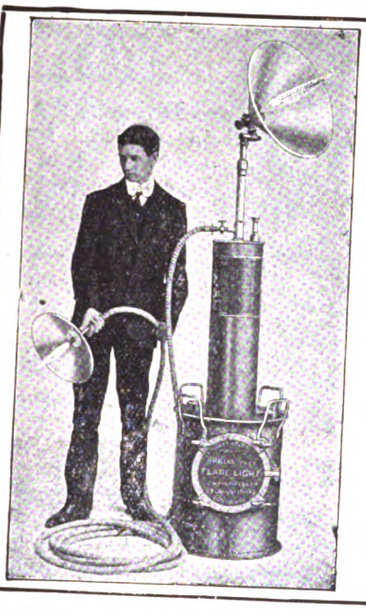
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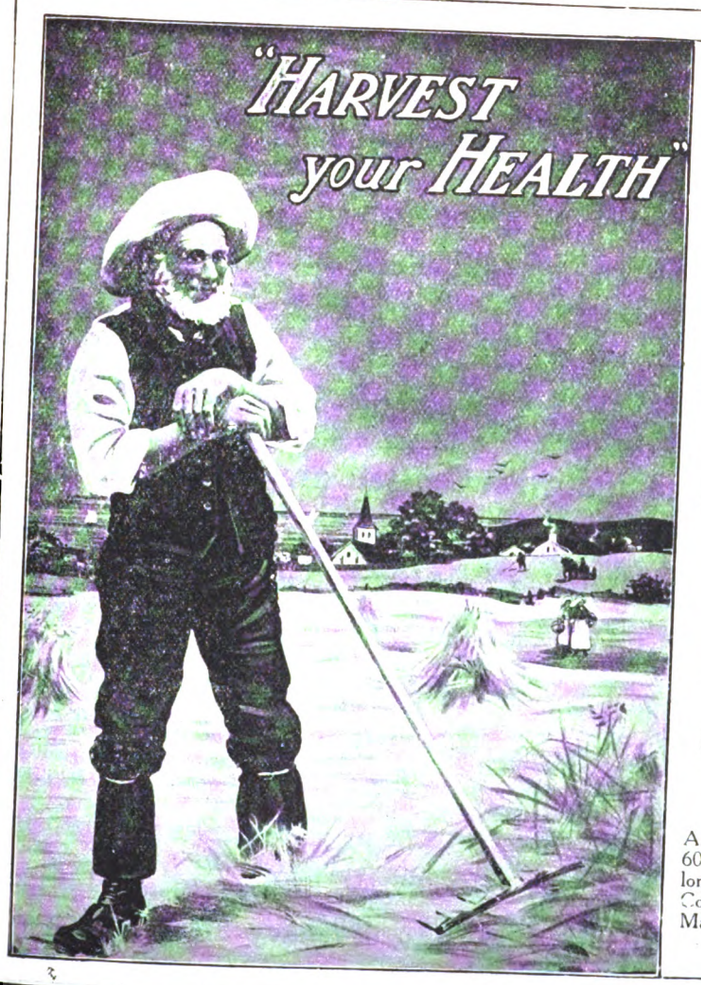
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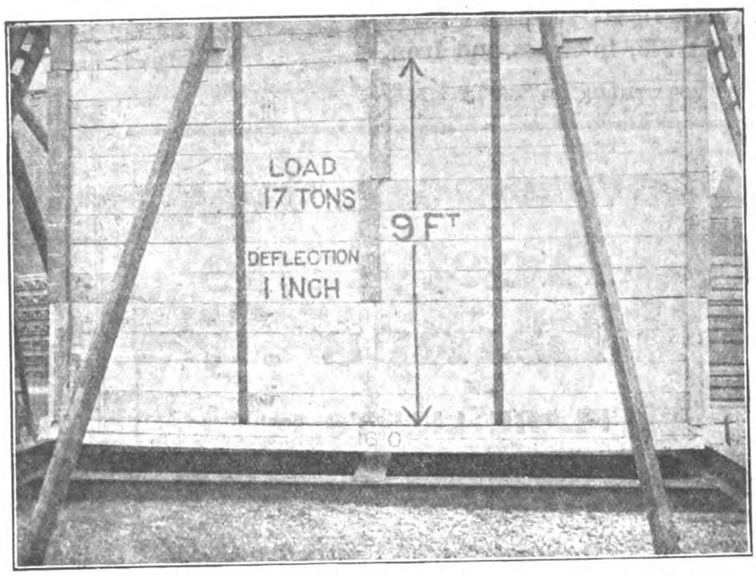
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are lattice girders minus compression web members, and in combination with concrete are more than double the strength of joists of equal weight.

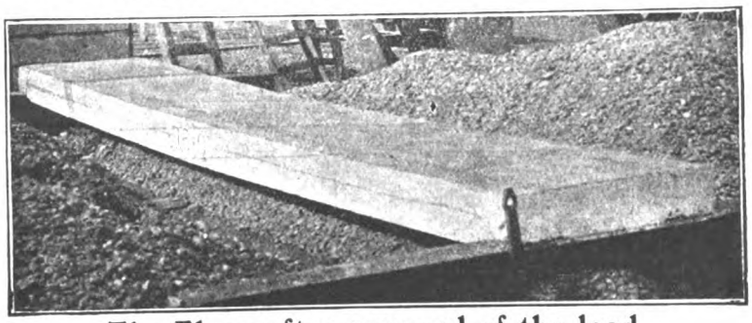
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14 cwts. per foot super. on Mon'lithcrete Floor.



The Floor after removal of the load.

Distributed Load in cwts. that one foot will carry at one-fourth the breaking weight—

(63)

Divide by the span in feet and by the working load in cwts. to find the Spacing in Feet.

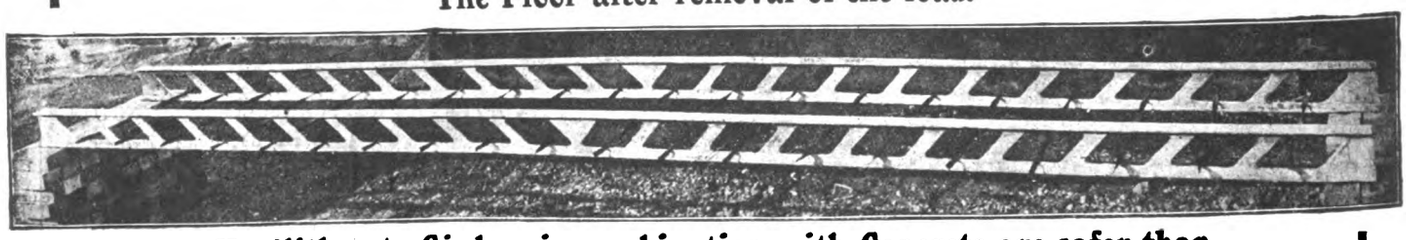
EXAMPLE.

Span 15 Feet.

Load 1½ cwts. per foot.

15)63·0(4·2
60
30
30
1·5)4·2(2·8
30
120
120

Or about 2′ 9″ to 2′ 10″ Centres.



Mon'lithcrete Girders in combination with Concrete are safer than Reinforcing Bars.

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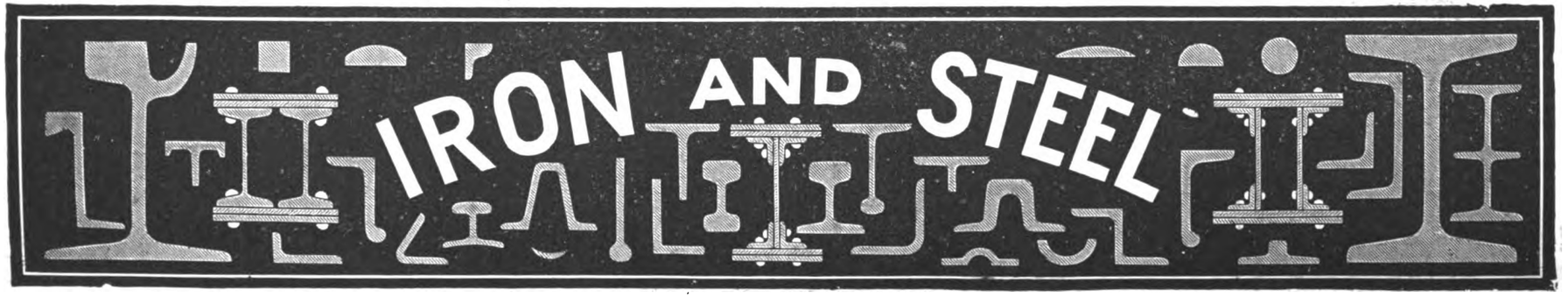
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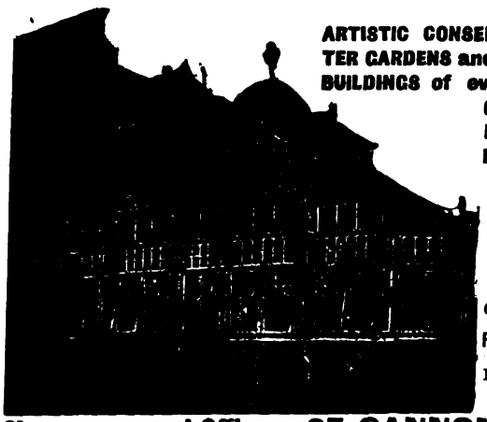
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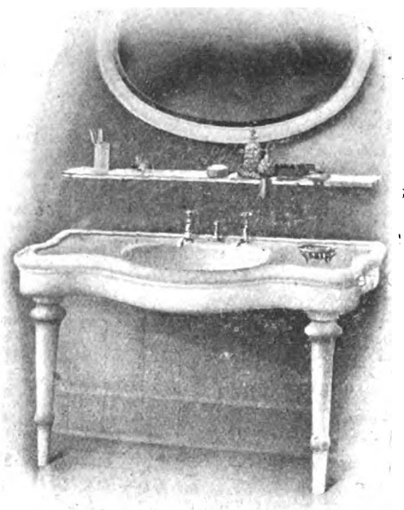
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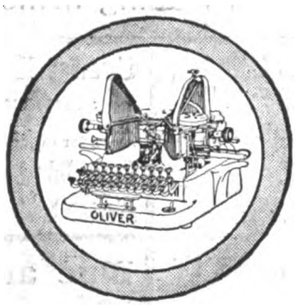
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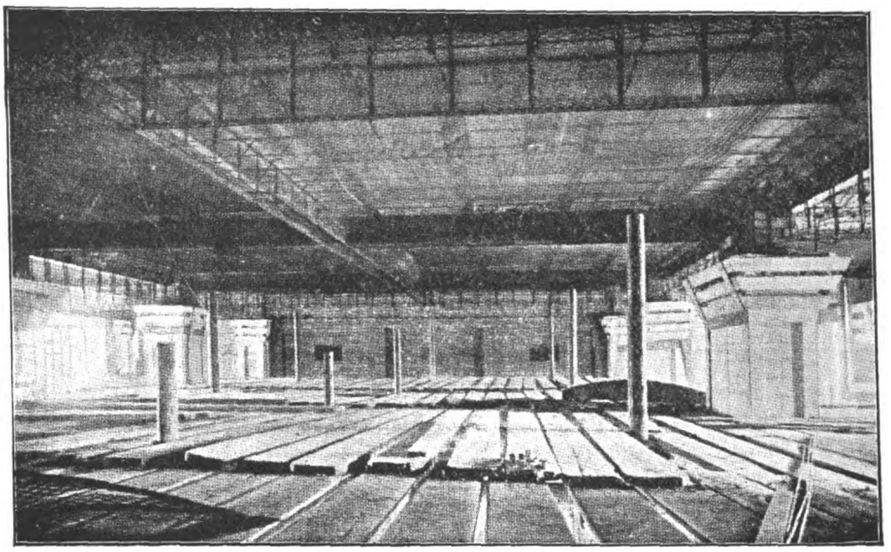
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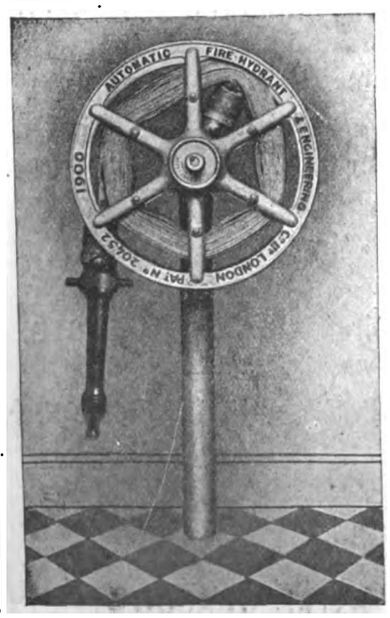
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EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

CRADLEY HEATH.—The Trustees of the United Methodist Church invite architects to submit designs on approval for Sunday school, with seating accommodation for about 1,000. For particulars apply to Mr. C. Clee, Cradley Heath, Staffs.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

IRELAND.—Dec. 1.—The Tralee Urban District Council invite designs for a proposed Carnegie library and technical school, to cost not more than 4,500*l.* Premiums of 20*l.* and 10*l.* The Town Clerk, Tralee, Ireland.

LEEDS.—Dec. 18.—The education committee invite architects practising in Leeds to submit designs for proposed training college for teachers, Kirkstall Grange, Far Headingley. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist the committee. Deposit 2*l.* 2*s.* Mr. James Graham, Secretary for Education, Education Department, Leeds.

MINEHEAD.—Dec. 11.—For a shelter with cloak-room and lavatories, on the beach at Minehead, Somerset, to cost not more than 3,000*l.* Deposit 5*s.* Premium 20*l.* The premiated plans to become the property of the Council; or, in event of the architect carrying out the work, the premium will merge in the commission. Mr. L. C. Webber-Incledon, clerk, 16 Park Street, Minehead, Somerset.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

WORKINGTON.—Nov. 30.—The Cumberland education committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the borough of Workington, Cumberland, for about 300 pupils of both sexes. Deposit 1*l.* 1*s.* Mr. C. Courtenay Hodgson, secretary, The Courts, Carlisle.



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BELFAST.—Nov. 6.—For building schools for the Select Vestry of All Saints' parish. Mr. William J. Fennell, F.R.I.B.A., architect, 2 Wellington Place, Belfast.

BLACKBURN.—Nov. 18.—For erection of Council school, Bangor Street. Deposit 1*l.* 1*s.* Apply at once to Messrs. Cooper & Slater, architects, 13 Richmond Terrace, Blackburn.

BRIDGWATER.—Nov. 9.—For the construction of trestles and bearers and boarding in connection with the reconstruction and enlargement of the extension to the platform in the Town Hall. Borough Surveyor, Municipal Buildings, High Street.

BRISTOL.—Nov. 12.—For erection of a mortuary at the Eastville workhouse. Mr. J. J. Simpson, clerk, St. Peter's Hospital, Bristol.

BURSLEM.—Dec. 1.—For erection and completion of new public buildings in Wedgwood Place. Deposit 5*l.* Send names by Nov. 8 to Mr. Arthur Ellis, town clerk, Burslem.

BURY ST. EDMUNDS.—Nov. 20.—For the provision of a cookery room, assembly hall, and alterations to the County school and P.T. Centre. Mr. A. Ainsworth Hunt, building inspector, Shire Hall, Bury St. Edmunds.

DARLINGTON.—Nov. 9.—The Durham County Council invite sole tenders for erection of a girls' secondary school at Darlington. Mr. W. Rushworth, Shire Hall, Durham.

DORCHESTER.—Nov. 13.—For alterations to entrance, &c., at the girls' school, Icen Way. Mr. J. Feacey, architect, South Walks, Dorchester.

ESKDALE (CUMBERLAND).—Nov. 10.—For building a block of three cottages on the Gatehouse Estate. Deposit 1*l.* 1*s.* Mr. Pallister, Long Rigg, Eskdale.

EVESHAM.—Nov. 16.—For the excavating, levelling, and forming the site of playground at the Grammar schools in course of building on Greenhill, and stocking-up of the hedge-row and piping the ditch bounding the grounds on the Inches Lane side. Governors' surveyor, Mr. R. Webb, 4 North Terrace, Evesham.

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HALIFAX.—Nov. 11.—For the erection of a store, butcher's shop, and appurtenances; also two through dwelling-houses at Skircoat. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

HASWELL.—Nov. 16.—The Durham County Council invite sole tenders for erection of (1) Haswell School (810 scholars), Mr. W. Rushworth, Shire Hall, Durham; (2) for removal of iron school at Harlow Green to Easington Colliery. Mr. F. E. Coates, Shire Hall, Durham.

HEAVITREE AND NEWTON ABBOT.—Nov. 19.—For new Council schools as follows, for the Devon County Education Authority:—At Heavitree, Ladysmith Road, for 360 children; and Newton Abbot, Wolborough, for 240 children. Deposit 1*l.* 1*s.* each. Send names to the County Architect (Education), 1 Richmond Road, Exeter.

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slater, painter, glazier, ironwork and fittings of the Burgh Academy, to be built on the Melrose Road. Messrs. J. & J. Hall, architects, Galashiels.

SCOTLAND.—Nov. 13.—The School Board of Lochgelly invite estimates for the brick and stone, joiner, plumber, gasfitter, ventilating, slater, plaster, smith, and painter work of extension to (1) Lumphinnans School, (2) Glencraig School. Schedules of quantities may be had and plans seen at the office of (1) Mr. Gilbert T. Scott, architect, 5 Church Street, Inverkeithing, for Lumphinnans School, and (2) Mr. G. Charles Campbell, architect, Methil, for Glencraig School.

SCOTLAND.—The Highland Railway Company invite tenders for the mason and brick, iron, carpenter, plumber, asphalte, slater, plasterer, painter and glazier, and other works of hotel proposed to be erected at Strathpeffer. Messrs. Cameron & Burnett, architects and ordained surveyors, Academy Buildings, Inverness.

SNAITH.—Nov. 8.—For erection of additions to the Snaith Clog Factory, near Goole. Mr. H. B. Thorp, architect and surveyor, Goole.

WAKEFIELD.—Nov. 19.—The West Riding Education Committee invite whole or separate tenders for the following work:—Laughten-en-le-Morthen new school, Wickersley new school (builder, joiner, plasterer, slater, plumber, painter). Deposit 1*l.* in each case. The West Riding Architect, County Hall, Wakefield.

WALES.—For the extension of the Wesleyan Sunday Schools, fronting Fanny Street, Cathays, Cardiff. Deposit 2*l.* 2*s.* Forward names to Mr. Henry Budgen, F.R.I.B.A., 95 St. Mary Street, Cardiff.

WALES.—Nov. 9.—For erection of an infants' school and altering present mixed and infants' schools at Cwmdare, near Aberdare. Deposit 2*l.* 2*s.* Mr. John Morris, director, Education Offices, Aberdare.

WALES.—Nov. 9.—For erection of twenty-four or more dwelling-houses, with roads, sewers, &c., at Aberfan, for the Pleasant View Building Club. Mr. O. P. Bevan, architect, Express Chambers, Merthyr Tydfil.

WALES.—Nov. 11.—For erection of twenty-four or more dwelling-houses, together with the construction of roads, sewers, &c., at Aberfan, for the Pleasant View Building Club. Mr. O. P. Bevan, architect and surveyor, Express Chambers, Merthyr Tydfil.

WALES.—Nov. 15.—For building three houses on site of Old Parrot Inn, Caerphilly. Messrs. D. Williams & Co., T.V. Brewery, Merthyr.

WALES.—Nov. 16.—For extensions and alterations at the Bethel Primitive Methodist Chapel, Garndiffaith, near Pontypool. Mr. A. Gordon Babbidge, architect and surveyor, Clarence Chambers, Pontypool.

WALES.—Nov. 22.—For erection of thirty-four houses at Pontymister, for the Risca Urban District Council, Mon. Deposit 2*l.* 2*s.* Mr. A. J. Dardis, Council offices, Risca, Mon., engineer to the Council.

WALES.—Nov. 24.—For erection of twenty-eight houses at Tynycae, Penygraig, Rhondda Valley, for Messrs. The Tynycae Building Club. Messrs. W. M. Lewis & T. Naunton Morgan, architects and surveyors, Tonypandy and Pontypridd.

WALKDEN.—Nov. 13.—For the erection of a technical school for the Worsley Urban District Council. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston, Lancs.

WIDNES.—Nov. 13.—For the enlargement and extension of the Widnes Municipal secondary and technical school. Deposit 3*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

WINCHESTER.—Nov. 13.—For erection of a new high school boarding house at Winchester. Send names to Messrs. Colson & Nisbett, architects, 45 Jewry Street, Winchester.

WREXHAM.—Nov. 10.—For supplying and fixing glass roofs to the balconies at the new workhouse infirmary. Mr. J. Price Evans, Argyle Chambers, Wrexham.

WRIGHTINGTON, NEAR WIGAN.—Nov. 8.—For erection of an elementary school to accommodate 120 children. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

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TENDERS.

BAINTON.

For erection of reading-room, &c., at Bainton, Northamptonshire. Messrs. J. B. Corby & Son, architects, Stamford.

J. Peasgood	£329 19 6
Peasgood & Sons	318 0 0
Crowson	309 10 0
Ireson	303 10 0
Hinson & Co.	298 0 0
Woolston	275 0 0
Story	266 17 0
Savage	264 0 0
Howes	263 0 0
Freeman	249 0 0
Scholes	248 0 0
Roberts Bros., Stamford (*accepted*)	247 0 0

BECKENHAM.

For making up Shortlands Grove and for the construction of a new road between Belmont and Hampden Roads, for the Beckenham Urban District Council. Mr. John A. Angell, surveyor.

Shortlands Grove.

H. & V. Smith	£1,469 0 0
Kavanagh & Co.	1,215 0 0
Woodhams & Sons	1,111 0 0
Free & Sons	1,057 0 0
Fry Bros.	1,011 0 0
Adams	997 0 0
Mowlem & Co.	995 0 0
Pearce, Forest Hill (*accepted*)	955 0 0

Belmont Road.

H. & V. Smith	518 0 0
Kavanagh & Co.	363 0 0
Free & Sons	356 0 0
Adams	340 0 0
Fry Bros.	337 0 0
Mowlem & Co.	330 0 0
Woodhams & Sons	318 0 0
Pearce (*accepted*)	317 0 0

BROMLEY.

For erection of the boys' secondary school.

Falkner & Sons	£11,824 0 0
Higgs & Hill	11,794 0 0
Carmichael	11,712 0 0
Downs	11,689 0 0
Graty	11,675 0 0
Podger & Sons	11,623 0 0
Holliday & Greenwood	11,612 0 0
Arnaud & Son	11,580 0 0
Duthoit	11,563 0 0
Patman & Fotheringham	11,428 0 0
Lowe & Co.	11,397 0 0
L. H. & R. Roberts	11,333 0 0
Wallis & Sons	11,324 0 0
F. & H. F. Higgs	11,293 0 0
Fairhead, Allen & Son	10,903 0 0
Cook & Sons	10,785 0 0

BUSHEY.

For making up Vernon and Beechcroft Roads. Mr. E. E. Ryder, surveyor, Bushey.

Champniss & Co.	£1,460 13 0
Free & Sons	1,384 9 11
Bliss	1,320 18 9
Bracey & Clark	1,256 0 0
Bailey & Sons	1,161 0 0
Jaggard, Bushey (*accepted*)	1,151 6 3

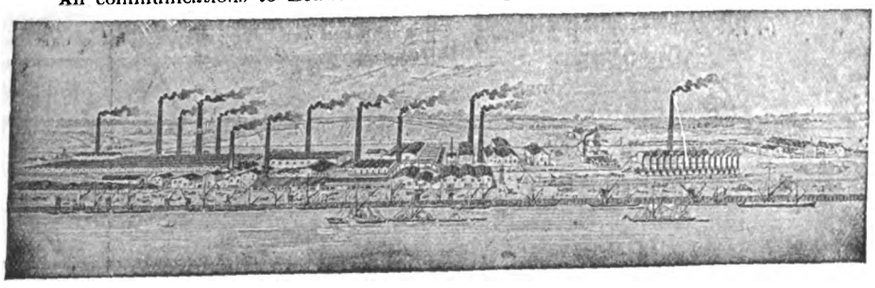
CAMBORNE.

For the construction of an open reservoir (1,000,000 gallons) and water-tower, for the Camborne Water Company. Mr. F. W. S. Stanton, A.M.I.C.E., engineer, Chatham.

Pethick Bros.	£4,915 0 0
Shaddock	2,831 0 0
Smith & Co.	2,647 0 0
Bennett	2,549 0 0
Brebner & Co.	2,468 0 0
Thomas & Son	2,430 0 0
Carkeek, Redruth (*accepted*)	2,414 0 0
Mitchell & Bond	2,253 0 0

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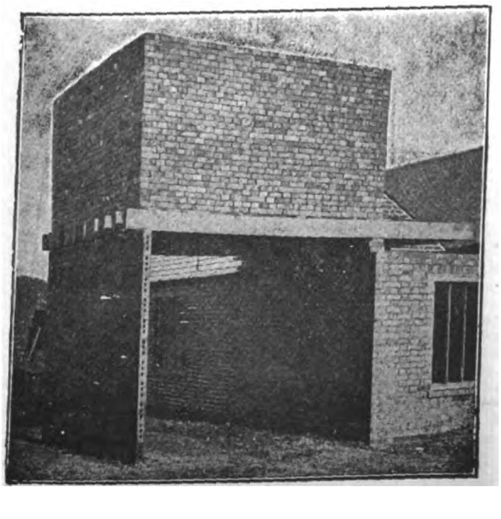
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DEVIZES.

For erection of a house of detention at the Central Police Barracks, for Wilts County Council. Mr. G. G. Powell, county surveyor, Trowbridge.

Chivers & Sons	£353 19 0
Burton	850 0 0
Blackford & Son	805 0 0
Patson Bros.	768 0 0
Siding	750 0 0
Preece	750 0 0
Webb	625 0 0
Stone	515 0 0
Ash	498 0 0
Moore & Sons, Trowbridge (*accepted*)	472 0 0

GRIMSBY.

For the erection of a Council school in Strand Street. Mr. H. C. Scaping, architect, Grimsby. Quantity by Mr. J. Watson, Hull.

Thomson & Sons, Ltd.	£13,422 0 0
Parker & Co.	12,175 0 0
Marrows	11,960 0 0
Salmon & Co.	11,660 0 0
Hewins & Goodhand	11,480 0 0
Kirton, Grimsby (*accepted*)	11,200 0 0

HINCKLEY.

For the erection of additions to Sketchley Dye Works, Hinckley. Leicestershire. Mr. W. T. Grewcock, A.R.I.B.A., architect, Leicester and Hinckley.

Haskard, Rudkin & Beck	£3,670 0 0
Herbert & Sons	3,664 0 0
Bowles & Sons	3,660 0 0
Hutchinson & Sons	3,590 0 0
Herbert	3,585 0 0
Scurr, Jowett & Co.	3,450 0 0
Chapman & Son	3,440 0 0
Bradshaw Bros	3,433 0 0
Jeffcote	3,372 11 6
Bentley & Co. (*accepted*)	3,319 0 0

LONDON.

For handicraft, metalwork and laundry centres, The Acland, St. Pancras, for the L.C.C.

Marchant & Hirst	£3,464 0 0
Stapleton & Sons	3,168 0 0
Brand, Pettit & Co.	3,166 0 0
Williams & Son	3,091 0 0
Willmott & Sons	2,942 0 0
Patman & Fotheringham	2,807 0 0
Price	2,777 0 0
Stevens & Sons	2,761 0 0
Kearley	2,757 0 0
Treasure & Son	2,696 0 0
McCormick & Sons, Northampton Street, Essex Road (*accepted*)	2,669 0 0
Architect's (Education) estimate	2,747 0 0

For the periodical painting and cleaning of the Gloucester Road, Camberwell North, and the West Square, Southwark West, schools, for the L.C.C.

Camberwell North, Gloucester Road.

Garrett & Son	£676 0 0
Vigor & Co.	638 0 0
Marsland & Sons	629 0 0
Triggs	622 0 0
Maxwell Bros.	612 0 0
Lathey Bros.	601 0 0
Holliday & Greenwood, Brixton (*recommended*)	547 0 0
Architect's (Education) estimate	650 0 0

Southwark West, West Square.

Downs	831 0 0
Leng	763 0 0
Lapthorne & Co.	698 0 0
Marsland & Sons	647 0 0
Goad	638 0 0
Garrett & Son	634 0 0
King & Son	532 0 0
Maxwell Bros.	619 0 0
Rice & Son	591 0 0
Holliday & Greenwood	583 0 0
Bragg & Sons, Brixton (*recommended*)	527 0 0
Architect's (Education) estimate	535 0 0

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LONDON—*continued.*

For alterations, Mantle Road, Deptford, for the L.C.C.

Hollingsworth	£1,981 0 0
Smith & Co.	1,767 1 1
Holliday & Greenwood	1,732 0 0
J. & C. Bowyer	1,673 0 0
Downs	1,668 0 0
Appleby & Sons	1,667 0 0
Parker & Sons	1,608 0 0
Leng	1,574 0 0
F. & T. Thorne	1,556 0 0
F. & G. Foster	1,548 0 0
Garrett & Son	1,496 0 0
Symes	1,493 0 0
Holloway, Deptford (*accepted*)	1,490 0 0
Architect's (Education) estimate	1,605 0 0

For new school, Haverstock Hill, St. Pancras, for the L.C.C.

Moss & Sons	£13,294 10 6
L. H. & R. Roberts	12,789 0 0
Kearley	12,769 0 0
J. & M. Patrick	12,672 0 0
Leng	12,654 0 0
Patman & Fotheringham	12,651 0 0
Godson & Sons	12,639 0 0
Treasure & Son	12,630 0 0
Triggs	12,343 0 0
McCormick & Sons, Essex Road (*accepted*)	11,842 0 0

For the enlargement and alteration of the Woolwich fire station, for the L.C.C.

Wall	£5,525 0 0
Leslie & Co.	5,511 0 0
Holloway Bros	5,400 0 0
Kirk & Randall	5,377 0 0
Higgs & Hill	5,287 0 0
F. & H. F. Higgs	5,145 0 0
Holloway	5,093 0 0
Carmichael	4,947 0 0
Johnson & Co., Wandsworth Common (*recommended*)	4,800 0 0
Architect's revised estimate	5,350 0 0

LONDON—*continued.*

For the erection of the fire station in Parnell Road, Bow, in substitution for the fire station in Glebe Road, Bow, for the L.C.C.

Munday & Son	£10,536 0 0
Higgs & Hill	10,416 0 0
Leslie & Co.	10,319 0 0
Wall	10,300 0 0
F. & H. F. Higgs	10,290 0 0
Kirk & Randall	10,200 0 0
Holloway Bros.	10,070 0 0
Carmichael	10,047 0 0
Smith & Son	10,000 0 0
Johnson & Co.	9,938 0 0
Perry & Co.	9,829 0 0
Holloway, Deptford (*recommended*)	9,677 0 0
Architect's revised estimate	10,071 0 0

MERTON.

For road-making and sewering works in Cannon Hill Lane. Mr. G. Jerram, surveyor, Merton.

	Flint.	Granite.
Lane & Co.	£990 0 0	£1,070 0 0
E. & E. Iles	957 0 0	1,056 0 0
Bell & Sons	879 0 0	960 0 0
Mowlem & Co., Westminster	824 0 0	*900 0 0

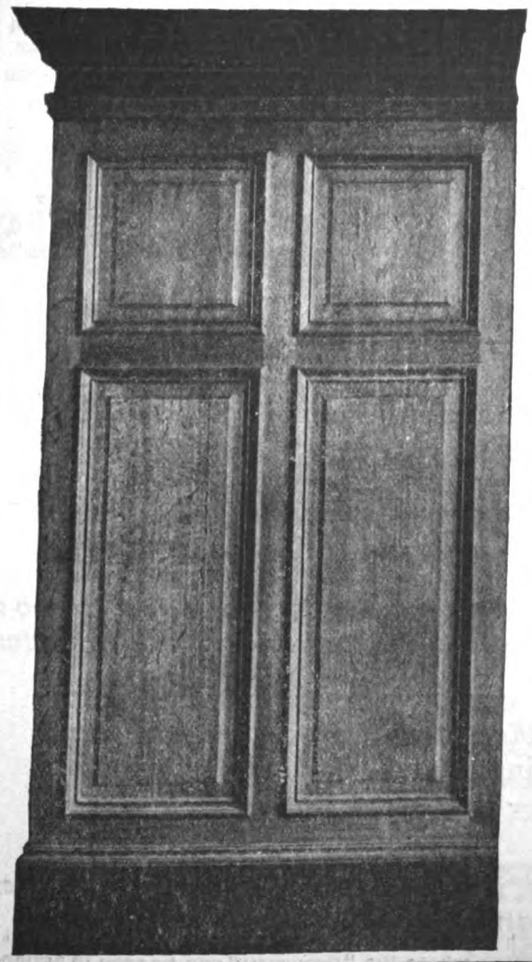
* *Accepted.*

RASTRICK.

For additions and alterations to Rastrick Grammar School. Messrs. Stocks & Sykes, architects, St. Peter's Street, Huddersfield.

Accepted tenders.

Bottomley, Brighouse, mason	£624 0 0
Bottomley & Sons, Brighouse, joiner	570 0 0
Sykes, Brighouse, plumber	338 6 0
Dyson, Huddersfield, concreting	226 12 8
Sykes, Brighouse, heating	131 0 0
Smithies, Brighouse, slater	91 10 0
Walker, Brighouse, plasterer	91 0 0
Roebuck & Son, Brighouse, painter	71 0 0



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MIDDLESEX.

For additions to Napsbury Asylum, for the County Council. Mr. Rowland Plumbe, architect, 13 Fitzroy Square, W.

Williams	£71,300	0	0
Allen & Sons	70,070	0	0
Dick, Kerr & Co.	68,469	3	6
Higgs & Hill	68,244	0	0
Holland & Hannen	66,750	0	0
Carmichael	66,100	0	0
Wall	65,000	0	0
Chessum & Sons	64,760	0	0
Greenwood	64,450	0	0
Pethick Bros.	63,266	0	0
Waring & White	63,041	0	0
Mowlem & Co.	62,913	0	0
Holloway Bros.	62,600	0	0
Perry & Co.	61,975	0	0
Pattison & Son	61,120	0	0
Minter	61,000	0	0
Lovatt	60,915	0	0
Spencer, Santo & Co.	60,760	0	0
Leslie & Co.	60,358	0	0
Foster & Dicksee	59,859	0	0
Wallis & Sons	58,276	0	0
Johnson & Co.	57,750	0	0
Lawrence & Son, Tottenham (*recommended*)	56,948	0	0

OLD BROMPTON.

For the demolition of certain buildings and the erection of a masonic hall, at Wood Street, Old Brompton, Kent.

Leonard	£1,549	0	0
Richardson	1,530	0	0
Gates & Sons	1,500	0	0
Smith & Son	1,499	0	0
Cornelius	1,487	0	0
F. & G. Foster	1,462	0	0
Skinner	1,417	0	0
Seager	1,398	0	0
West Bros.	1,375	0	0
Baker & Son	1,363	0	0
Filley	1,330	0	0
Phillips, Gillingham (*accepted*)	1,295	0	0

SALTNEY AND CHESTER.

For sewerage and sewage disposal works for the parish of Saltney and part of Chester, for the Hawarden Rural District Council. Messrs. Elliott & Brown, A.M.I.C.E., engineers, Nottingham.

Firth & Co.	£20,621	6	5
Hutton & Co.	20,476	1	0
Vickers	18,761	6	7
Wilmott	18,104	0	0
Lane Bros.	17,810	0	0
Hill & Co.	17,571	0	0
Barry	17,555	0	0
Morley & Sons	17,481	17	0
Underwood & Brother	17,236	16	5
Jones	17,150	4	10
Bower Bros.	16,998	0	0
Johnson Bros.	16,980	0	0
Mitchell & Sons	16,444	0	0
Riley	16,322	12	7
Moss & Co.	16,284	0	0
Brebner & Co.	16,148	16	0
Jowett Bros.	15,881	8	0
Jewell	15,701	15	0
Wickstead & Beardsell	15,148	4	10
Price & Co., Nottingham (*accepted*)	14,159	12	0
Buckley	14,126	14	0

SCOTLAND.

For extending the Forfar Academy, for the School Board.

Accepted tenders.

Laird, mason (Burghmuirhead stone)	£2,097	0	0
Stewart, joiner	1,377	0	0
M'Laren & Sons, plumber	422	15	0
Boyd & Sons, Paisley, heating	225	5	0
Kerr, slater	135	0	0
Masterton, plasterer	126	0	0

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London Showrooms, Saracen's Head Buildings, Snow Hill, City, W. E. CLARKE, AGENT, where the "Drawwell" can be seen in action.

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WALES—*continued.*

For sewerage and sewage disposal works at Clydach-on-Tawe, for Pontardawe Rural District Council. Mr. J. MORGAN, engineer, Pontardawe.

Jones & Co.	£15,968 5 10
Jenkins	15,688 13 3
Nunn & Co.	13,947 5 10
Griffiths	13,742 18 2
Mackay	13,700 0 0
Morgan	13,437 17 5
Smith	13,176 9 5
Taylor & Sons	12,871 13 4
J. & T. Binns	12,725 13 11
Wright & Co.	12,320 18 4
Walters & Johns	12,294 7 5
W. & T. R. Watson	11,579 7 5
Johnson Bros.	11,370 0 1
Barnes, Chaplin & Co.	10,928 19 10
WALKER, Clydach (*accepted*)	10,285 16 9

For additions and alterations to Cwmbran Police Station and Court. Mr. WILLIAM TANNER, F.S.I., county surveyor.

Davies & Sons	£1,422 0 0
Blundell & Bevan	1,260 15 0
Moon	1,135 0 0
A. & J. Richards	1,117 0 0
Charles	1,100 0 0
Jenkins	1,090 0 0
Morgan & Co.	1,060 0 0
Brownscombe & Son	1,050 0 0
Partridge	1,050 0 0
Reed	1,048 0 0
Simmons	997 15 0
Leadbeter	976 0 0
WILLIAMS, Newport (*accepted*)	959 0 0

For the erection of twenty or more houses at Bargoed, for the Graig Building Club, Bargoed. Mr. H. GABE JONES, architect and surveyor, Hengoed.

Watkins	£215 0 0
VODDER & LEE, Bargoed (*accepted*)	198 15 0
Davies	196 17 0

WALES—*continued.*

For erecting a residence at Llwynhudol, Abererch, Pwllheli. Mr. R. LLOYD JONES, architect, Pwllheli.

Jones, Roberts & Jones	£910 0 0
E. Jones	900 0 0
Parry	849 0 0
Roberts	767 0 0
Roberts	767 0 0
Williams	766 0 0
Thomas	728 17 0
G. JONES, Morfa Nevin, Pwllheli (*accepted*)	683 0 0

TRADE NOTES.

THE hackneyed quotation, "Times change and we with them," might well be adopted as the motto of Messrs. J. Tylor & Sons, Ltd., for after a career extending over one hundred and thirty years they are still abreast, if not in advance, of the latest ideas in their business. In some industries the impression of being a little old-fashioned is a commercial asset; but this is very far from being the case when sanitary engineering is concerned. Here the successful manufacturer has to be ready to adopt the very latest ideas and (sometimes) to meet the most passing whims. The mere possession of a record extending well over a century is of small value compared with one gained by progressive management and a reputation for up-to-dateness. Fortunately these two qualities of maturity and youthful vigour are not by any means an impossible combination, and when they are found together, as in the case of this firm, the result is most satisfactory. To many of their old customers the showrooms of Messrs. J. Tylor & Sons are no doubt almost ineradicably associated with 2 Newgate Street, E.C. Unfortunately that long-established link had to be broken, and the showrooms are now, and have been for some time, at 232 Tottenham Court Road (which is only three minutes' walk from Oxford Street), though the works continue at Belle Isle, King's Cross, N. The new showrooms well repay a visit, for the entire premises from basement to topmost storey are called into requisition to display the goods turned out by the firm. Messrs. Tylor & Sons do not limit themselves to sanitary goods, for they are also hydraulic engineers,

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brass and iron founders. In the basement there is a large stock of fireclay and earthenware goods, such as urinals, ranges, including the latest patterns, lavatory ranges of many varieties, surgeon's lavatories, sinks and other appliances designed for hospital work, together with much else for particular and general requirements. Here, as throughout the showrooms, numberless examples are to be found of scrupulous care exercised so as to conform with the most exacting demands of hygiene. This is especially marked in the avoidance of concealed or not easily-cleanable parts. It is to be hoped that the physique of the rising generation will be materially improved by the anxious thought and skill lavished on such minute details as a lavatory overflow. Messrs. Tylor & Sons can claim a large share of any credit, for they have supplied sanitary goods to several large colleges, including the naval schools at Osborne, Devonport and Dartmouth, Haileybury College, and elsewhere. Their inventions cover a very wide area. In cisterns alone they have about ten patterns, the latest development of which is the "Regal," a silent, powerful and first-class cistern. Baths are made of almost numberless shapes, sizes and qualities. But it is useless to attempt to describe all that is to be seen at the showrooms, for the mere list at the end of their catalogues fills twelve columns. The only satisfactory way of obtaining an accurate idea of what is being done, and has been done, by the firm to promote the sanitary well-being of the community is to make a personal inspection.

The Falkirk Iron Company have removed from 67 Upper Thames Street, E.C., to Craven House, Kingsway, W.C.

The latest form of cottage bath comes from Manchester. It is the invention of, and solely made by Mr. H. Chadwick, 26 Hawthorn Street, Audenshaw. The two patterns in which it is stocked are alike in the fact that they both combine a bath with the kitchen sink. The fundamental difference of the two is that style A is convertible into a bath 5 feet 4 inches long, while style B has only half that length, and is therefore more in the nature of a bath-tub. In the first kind the upper half turns over and rests on the lower half. When in that position the sink (previously on its under side) stands 2 feet 9 inches from the floor. All the sink's waste water discharges through a waste and overflow pipe on the outside of the bath. The bath and the sink are both filled from the same pipes. This of course obviates the expense of any extra plumbing. Style B is a tub 2 feet 6 inches from the floor, made of rustless sheet metal, enamel finished, with a cover on which a sink 2 feet 6 inches by 1 foot 6 inches by 4 inches is fixed. The cost of the most expensive is under a 5*l.* note, and is in consequence well worth consideration by the owners of small house property, who recognise the demand for such a convenience, but have hitherto been deterred by lack of space and lack of money.

VARIETIES.

New Continental Turbine Steamer.—The Great Eastern Railway Company have ordered another turbine steamer for their Harwich-Hook of Holland service. This vessel will be a sister ship to the *Munich*, and constructed by the same builders, Messrs. John Brown & Co., Ltd., Clydebank, for delivery next summer.

The Illuminating Engineering Society will hold their opening meeting on Thursday, the 18th inst., at 8 p.m., at the premises of the Royal Society of Arts, 18 John Street, Adelphi, London, W., when a brief report of the progress of the Society will be presented by the Hon. Secretary, and the inaugural address will be delivered by Prof. Silvanus P. Thompson, D.Sc., F.R.S., the first President of the Society.

The Kent education committee recommend the raising of loans not exceeding the following amounts:—Paddock Wood Council school (adaptation of premises, heating apparatus, tar paving, &c.), 525*l.*; Cliffe infants' Council school, site, 200*l.*; Minster Halfway Houses Council school, buildings, 1,510*l.*; Sutton Valence Council school, buildings, 2,740*l.*; Swanscombe, Knockhall Council school, site, 400*l.*

The Cadder School Board have under consideration alternative plans submitted by Mr. Fairweather, architect, Glasgow, for an extension of Stepps school. In the one case five rooms are shown added at the back, giving accommodation for 300 children, while in the other case the extension would be two storey, giving eight rooms, or accommodation for 480 scholars. The minor scheme is estimated to cost from 3,150*l.* to 3,500*l.*, while the major is put down at from 4,800*l.* to 5,200*l.*



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ILLUSTRATIONS.

SELBY ABBEY.—NEW ROOD SCREEN, DIAGONAL VIEW—THE REREDOS—NORTH SIDE OF NAVE, LOOKING N.-W.—THE CHANCEL.

OXFORD COLLEGE SERIES, BRASENOSE.—BACK QUAD—HALL.

LIVERPOOL UNIVERSITY SCHOOL OF ARCHITECTURE.—DETAIL FROM TRINITY COLLEGE, CAMBRIDGE.

THE opening of the Leavesden Road Baptist Church and Institute, Watford, took place recently. The church is designed in a late period of Gothic freely treated, and will accommodate 700 persons. Externally the building is faced with pressed red bricks with Bath stone dressings; the internal joinery is of pitch pine. The contract has been carried out by Messrs. Chas. Brightman & Son, Watford, and amounts to 4,150*l*. The architects, whose designs were selected in a recent competition, are Messrs. Geo. Baines & Son, of 5 Clement's Inn, Strand, W.C.

THE British Uralite Co., Ltd., of 16 St. Helen's Place, London, E.C., have been awarded a diploma for gold medal for their exhibit at the Imperial International exhibition at the Great White City. The exhibit was a pavilion constructed of the company's well-known fireproof materials uralite and uralite asbestone. The company manufactures solely in England, where it is the only maker of asbestos cement tiles.

THE Lancashire county medical officer, Dr. E. Sergeant, in his annual report deals with the housing of working classes. The report says in the administrative county 164 houses were condemned, 59 were closed, 64 demolished, 184 made habitable. In none of the county districts has sufficient activity been displayed in this direction; some of the rural districts exhibit the worst specimens of insanitary dwellings. Overcrowding is serious in certain districts.

A SMALL holdings experiment is to be carried out through the co-operation of the Woods and Forests Department in a field of about thirty acres on the west side of the King's Park, Stirling. There will be ten houses in the farm colony, with accommodation for a horse and ten cows. The houses are all to be of brick, and will consist of three blocks containing two houses, one block of three houses, and one single house. All are to be equipped with modern conveniences, including baths and cooking ranges. It is expected that the outlay will amount to 3,500*l*. The various contractors, who are all Stirling tradesmen, have been fixed.

THE Liverpool Cathedral Committee met on Monday last. Mr. Gilbert Scott (the architect) reported that the stained-glass windows were ready for insertion in the lady chapel, and asked the committee to close the chapel to the public until the work was completed. It is anticipated that the work will occupy from four to six months. The organising secretary was directed to prepare a history of the cathedral movement from its inception. The additional sum needed to complete the portion of the cathedral now in course of erection is between 60,000*l*. and 70,000*l*. The portion in question includes the lady chapel, the chapter-house, the vestries, the choir, and a portion of the great transept, and will afford accommodation for a congregation of about 2,000. If the funds are forthcoming this portion can be completed in about five years' time.

NEW CATALOGUES.

THE latest catalogue ("B.L.") issued by the Carron Company deals with their baths, lavatories, and sanitary appliances. The Carron ironworks are laid under contribution to supply iron of the finest quality for these goods; it is specially selected and tested so as to make sure of its freedom from the defects which beset the manufacturer's most painstaking efforts. The same care is exercised throughout all the stages of the bath's production. There is, of course, a wide selection of patterns. A useful line is their combination bath and lavatory basin, in which a basin fits into two sockets practically flush with the surface of the bath, and is filled from the combined hot and cold tap. The baths are in all cases both porcelain enamelled and metallic enamelled, the former being in four grades of finish and the latter in two. Twenty designs are given for outside decoration. There are also many different patterns of lavatory stands, as well as taps, wastes, and brackets. Another department of the Carron Company is represented in a pamphlet illustrating their gas fires.

"By fixing the Maximum Daylight Glass directly in the sash the rays of light are refracted towards the rear of the room and at the same time diffused sideways. An even distribution of all the light available is made. This double refracting power of the Maximum makes it effective in

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WARRINGTON: F. M. Appleton, Rose and Crown Street.
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LEEDS & BRADFORD: E. Oldroyd & Co., Ltd., Crown Works.
LONDON: Basil Gee, Palace Chambers, Bridge Street, Westminster.
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many places where ordinary corrugated or plain prismatic glass is of little use beyond projecting a beam of light in one direction only." This explanation is taken from the catalogue of the Maximum Light Window Glass Company, which contains, in addition to much descriptive matter, a large number of photographs showing buildings where the glass has been employed, and a much larger number of names of firms at home and abroad who have used it. Seven pages are required for the London installations alone, and even then the list is only a partial one. It may be safely said that if the Maximum glass is able to justify its claims under the abnormal conditions of the metropolis it will be able to do so anywhere. The last twelve pages deal with "Cat's Eye Glass"—another patent by Mr. E. J. Dobbins. This latter is adapted to serve in decorative positions, and while still increasing the light in the interior, it obscures the view. It is recommended for the outer glazing of doors, windows, skylights, &c.

Laundry machinery as made by Messrs. Smith & Paget, Crown Works, Keighley, ranges from a sixpenny sad iron to a water-heater costing 103*l*. In between these two extremes there come a large number of machines, most of which are triumphs of ingenuity. Their eighty-page catalogue shows the very latest ideas and inventions in connection with their business. Messrs. Smith & Paget have been building up their reputation and increasing their plant during the past forty years, and are now in a position to quote for complete installations as readily as for single machines; moreover, they are prepared to erect the plant and to set it to work.

Messrs. Merryweather & Sons, Ltd., have just issued a catalogue which deals exclusively with pumps and water-raising machinery. A multitude of ways of driving a pump have been evolved since manual force was first employed. The firm have now to manufacture pumps driven by hot air, petrol, steam, electricity, turbine, oil, gas, and others beside. If driven by hand alone there is an almost equally wide departure from primitive methods. Messrs. Merryweather & Son may be relied upon to supply nothing but the best. The conditions under which water is to be obtained differ so greatly that only a firm possessed of exceptionally great resource can hope to succeed. The possession of this will be denied by no one to this firm.

GLASGOW BUILDING REGULATIONS.

Mr. A. W. Myles, Town Clerk of Glasgow, has given notice that, in accordance with the Glasgow Building Regulations Act, 1900, application will be made to the Secretary for Scotland on December 1 for confirmation of the by-laws made under that Act and adopted by the Town Council at their meeting on 14th inst. According to the Act the by-laws must be confirmed by the Secretary for Scotland before they can take effect, and before Lord Pentland gives his decision he may cause such further intimation and institute such inquiry as he may think proper. There are in all 104 by-laws, but most of these are existing by-laws or modifications or amendments of them which are being made to meet difficulties that have arisen in the practical working out of the by-laws made under the 1892 Act, which are at present in force. Attention may be directed to the most important changes.

Prevention of Fire.

To prevent the spread of fire it is set forth in By-law 24:—

The walls enclosing a common stair hereafter built in any building other than a tenement not exceeding four storeys in height shall be carried up 9 inches in thickness above the roof to the extent of 18 inches, measured at right angles to the slope of the roof.

And in By-law 25:—

Where in any building exceeding 100 feet in length a cross wall or party wall is hereafter built through the floor of the highest storey, such wall shall be carried up 9 inches in thickness above the roof to the extent of 12 inches, measured at right angles to the slope of the roof.

By-law 57 provides:—

Where buildings are made of fire-resisting material throughout, and are so designed that the weight of the several floors and the roof is carried by columns and beams in such manner that the external walls of each storey do not carry any part of the weight of the floors above such storey, such walls, if built of brick, concrete, or cube stone, and not exceeding 14 feet in height above the bearing of such walls, shall be not less than 14 inches in thickness.

By-law 103 is as follows:—

In buildings of the warehouse class hereafter erected, all skylights, lantern-lights, and roof-lights, and all win-

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White Enamelled Boot Cupboard, interior fitted with two shelves, enclosed by wood panelled doors, 2ft. 9in. wide, 3ft. 3in. high. 14s. 6d.



Fine old inlaid mahogany Grandfather Clock, £6 18s. 6d. Original price, £15.



Queen Anne Tallboy Chest of Drawers, with fine old brass handles, 3ft. 6in. wide, 6ft. 7in. high, £15 10s. Od. Original Price 25 Guineas.

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FRIDAY, SATURDAY, and SUNDAY to MONDAY or TUESDAY TICKETS are issued from certain London Stations as follows:

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Broadstairs ...	16/0	12/0	8/0	Rye	16/0	12/0	9/0
Canterbury ...	14/0	10/6	8/0	St. Leonard's	14/0	10/6	8/0
Deal	18/6	12/6	9/0	Sandgate ...	17/6	12/6	9/0
Dover	17/6	12/6	9/0	Sandwich ...	18/6	12/6	9/0
Folkestone ...	17/6	12/6	9/0	Shorncliffe ...	17/6	12/6	9/0
Hastings ...	14/0	10/6	8/0	Tun. Wells ...	8/6	5/6	4/6
Herne Bay ...	14/0	10/0	7/0	Walmer	18/6	12/6	9/0
Hythe	17/6	12/6	9/0	Westgate ...	16/0	12/0	8/0
Littlestone ...	16/0	12/0	9/0	Whitstable Tn.	14/9	10/0	7/0

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dows lighted from any street, lane, court, or well which measures less than 20 feet across in any direction, shall, so far as regards the frames and glazing thereof, be constructed of fire-resisting materials and glazing respectively.

Paving of New Streets.

By-law 59 states:—

Unless where the Dean of Guild shall otherwise authorise or require, the following regulations shall apply to the paving of new streets:—Where the gradient is steeper than 1 in 45 and is not steeper than 1 in 25 the street shall be paved with tar macadam not less than three inches in thickness, and laid on a foundation of hand-set stone bottoming not less than nine inches in thickness; where the gradient is not steeper than 1 in 45 the street shall be paved with asphalt not less than 1½ inches in thickness and laid on a foundation of concrete not less than six inches in thickness. No new street shall be paved with rubble causeway.

Fixing of Slates.

At present every course of slates on a roof is double-nailed, the result being that it is impossible to repair these roofs in a satisfactory manner. To remedy this it is now enacted in By-law 33 that slates on roofs hereafter constructed shall "be secured on every third course by at least two strong copper, galvanised iron, or other suitable nails, and the slates on the two other courses by one such nail," except that each slate upon a Mansard roof which is not protected by a parapet at the eaves shall be secured by two nails.

Ventilation of Back Courts.

To make better provision for the passage of currents of air, By-law 62 states:—

When any division wall or fence in or between back courts, courts, or areas is in a state of disrepair, the owner thereof shall, as may be required by notice by the Master of Works, repair the same or substitute therefor an open iron railing.

Removal of Disused Sewers.

The authorities have no power under the existing law to compel disused sewers to be removed, the consequence being that these are often allowed to remain in the ground with their foul contents, and there have even been cases where new drains were connected with these obsolete sewers and sewage poured into them until its overflow led to discovery. This is provided against by By-law 99, which says:—

Where any public, common, or private sewer is provided in lieu of any existing sewer which ceases to be used, the person making such substituted sewer shall, on the completion thereof, remove the disused sewer and any contaminated soil surrounding it, and shall thereafter make up the ground with clean material, all to the satisfaction of the Master of Works. Where any public, common, or private sewer ceases to be used the owner thereof, or other person who was liable to maintain such sewer, shall remove the same and any contaminated soil surrounding it, and thereafter make up the ground with clean material, all to the satisfaction of the Master of Works.

Miscellaneous.

As the result of an arrangement between the representatives of the masters and workmen, a by-law has been inserted, No. 92, which provides for the use of substantial gangways, working platforms, or scaffolds during the construction, demolition, alteration, or repair of any building and for the weekly inspection of these.

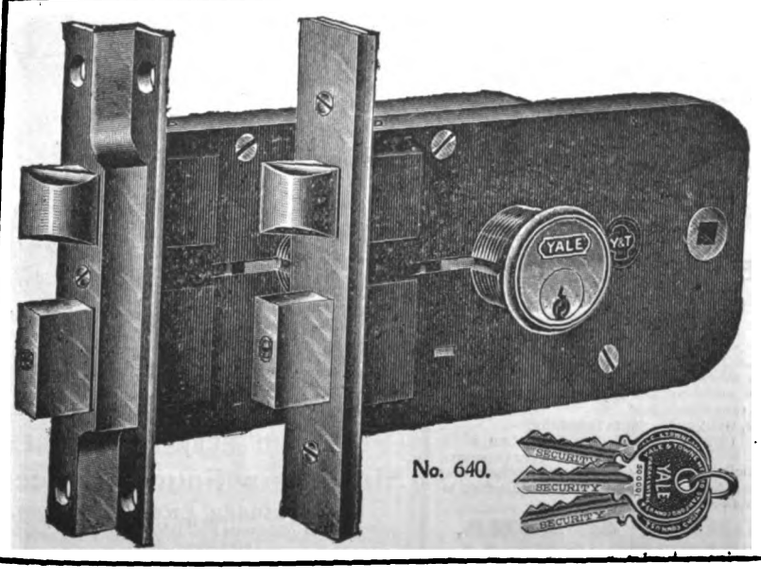
Another by-law, No. 90, makes compulsory the provision of sanitary conveniences in theatres, music-halls, circuses, halls, concert-rooms, ball-rooms, and exhibition-rooms in proportion to the accommodation of the building.

A PAIR OF COTTAGES, NEWCASTLE-ON-TYNE.

THIS pair of cottages was erected at Walker Gate, Newcastle-on-Tyne, for the Wallsend Industrial Co-Operative Society, Ltd., and was awarded a silver medal in the recent North of England Model Cottage Exhibition. The walls are constructed of hard local bricks, 11 inches thick, with a cavity in centre, and asphalte damp-proof course, and are faced externally with local pressed red bricks up to first floor level, and above covered with two coats Portland cement, dashed with white spar. All floors except scullery, &c., are of wood. The floors of pantry and coals are of concrete, with a smooth Portland cement surface. The roof is covered with Green's best French tiles and half-round ridge tiles. The whole of the windows are wood casements, opening outwards. The architect was Mr. Edward Cratney.

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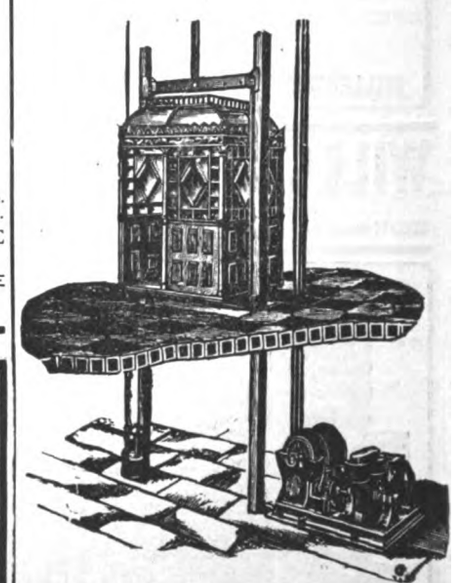
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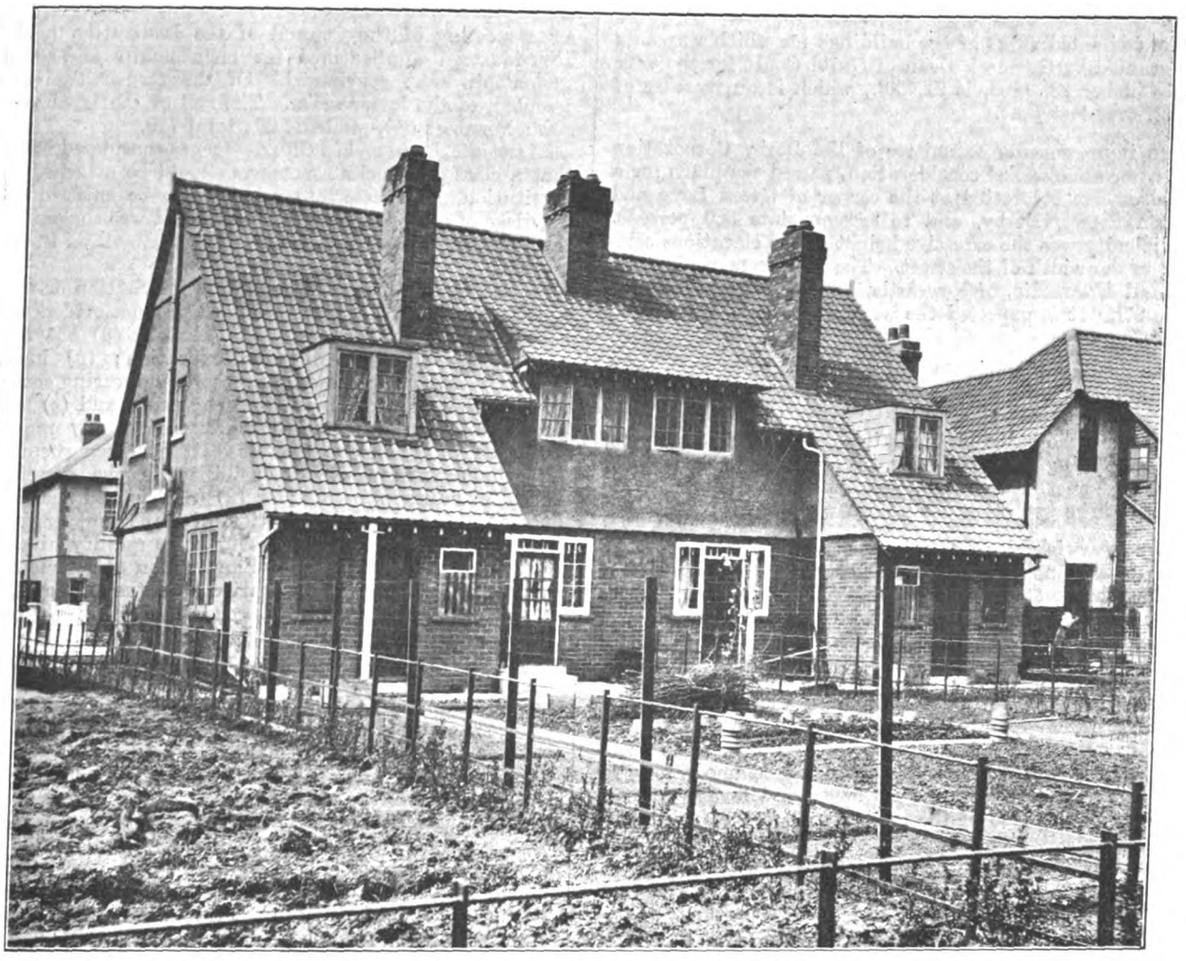


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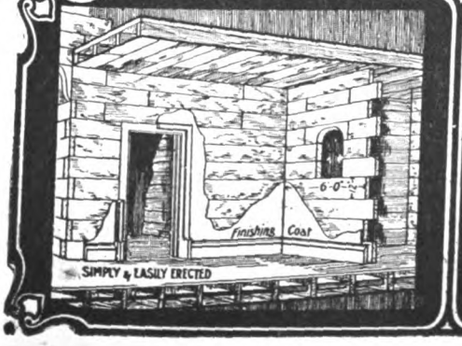
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BUILDING AND BUILDERS.

THE estimated value of the buildings for which warrants were granted by Greenock Dean of Guild Court for the year ended October 28, 1909, is 91,450*l.*, which is an increase of 28,005*l.* over last year.

THE improvements committee of the Derby Corporation have, after some weeks' consideration, passed the plans for a hippodrome to be erected at the corner of Green Lane and Macklin Street, Derby, and to accommodate 860 persons. The difficulty was the excessive height of the elevations compared to the width of the street. The architects are Messrs. Marshall & Tweedie, of Newcastle, and the cost is estimated at 15,000*l.* It is expected the work will not be commenced at once.

THE number of warrants granted by the Edinburgh Dean of Guild Court from November 1908 to October 1909 was 699. Although that total is seventy-three less than for the preceding year, the value of the buildings was 126,290*l.* more, the total being 569,670*l.* Mr. W. Allan Carter, C.E., 51 Queen Street, Edinburgh, has been elected Dean of the Guildry. The two other candidates withdrew.

THE Warwickshire County education committee has decided to erect another school at Bedworth, and a suitable site has been secured on the outskirts of the town, on the Nuneaton side. Exhall schools are to be enlarged at a cost of about 500*l.*, and several new class-rooms added to the existing school at Hartshill.

THE Reading Town Council have approved the preliminary plans prepared by the borough surveyor for an open-air swimming bath of concrete at Coley. The buildings, which are of brick, provide accommodation for attendant, washing house, cycle house and lavatory accommodation. The area of the land offered to the Corporation comprises about 3¼ acres, and the price to be paid is 950*l.* The cost is estimated to be as follows:—Constructing the bath, 1,670*l.*; buildings, platforms, foot-bridges, roads and other works, 1,650*l.*; land (950*l.*) and expenses (say 50*l.*), 1,000*l.*; total, 4,320*l.* The borough surveyor is to prepare detailed plans.

THE INSTITUTION OF MUNICIPAL ENGINEERS.

AT a meeting of the Council of the Institution held last week fourteen applications for membership and seven for studentship were considered. Of the former twelve were accepted, of the latter seven. The roll of the Institution is now: Members 630, students 89; total 719.

Associate Membership Class.—It was considered advisable that a class of associate members should be attached to the Institution, such associate members to be entitled to the privilege of corporate membership, and it was suggested that the following should be the clause in the by-laws in respect thereto:—

Associate Members.—A candidate for election or transfer to the class of associate member must produce evidence to the satisfaction of the Council:—(1) That he (*a*) has received a good general and scientific education; (*b*) has been regularly trained in those branches of engineering comprised within the duties of a municipal engineer; and (*c*) has had subsequent employment in the service of any municipal authority of which one year at least has been spent in an important position of responsibility in the direction or design of municipal work; or (2) (*d*) has had such experience in the design or execution of important engineering work for any muncipal authority as to qualify him in the opinion of the Council for the distinction of associate membership. The opinions of members on the proposal, to be submitted before the next council meeting to be held November 27, are invited.

Honorary Librarian.—It was suggested that "The Council shall at their first meeting after the annual election have power to appoint an honorary librarian from among the members of the Institution, this official to be an *ex officio* member of the Council until the next annual election." The opinions of members are invited on this proposal also.

General Meeting and Social Evening.—It was decided that arrangements be made for a general meeting, followed by a social evening, to which latter ladies would be invited, to be held in December. A committee with power to act was appointed to arrange the details. Members who are willing to submit papers for reading at this or a subsequent meeting are particularly requested to communicate at once with the secretary.

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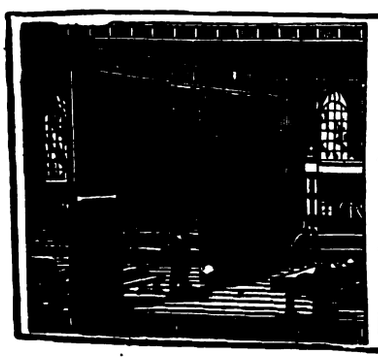
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Visit to Works.—The secretary was instructed to arrange for a visit to works for some day in November.

Joint Meeting of Council and Honorary Secretaries.—It was decided that the joint meeting of the Council and the honorary secretaries of the various district committees should be held on November 27, the day of the next council meeting.

Municipal Golf Tournament.—A letter was read from Mr. Charles Vawser, of St. Mark's Lodge, Woodville Road, New Barnet, with reference to a proposed municipal golf tournament. Members requiring particulars are requested to write to him.

Municipal Engineering Corps.—A letter was read from the honorary secretary of the Municipal Engineers' Imperial Defence Committee asking for the support of the Institution in the proposed scheme for the formation of a municipal engineering corps. The Council, while expressing their accordance with the general principles, resolved to defer consideration of the letter until their next meeting.

THE water-supply of Dunoon, N.B., is to be improved by the substitution of larger pipes at a cost of 3,500*l*.

ELECTRIC light is being introduced into St. Patrick's Cathedral, Dublin, by Messrs. Wm. Coates & Son, of Dublin and Belfast, under the direction of Sir Thomas Drew. The whole of the existing gas fittings are to be taken out. They will be replaced, as regards the nave, by three 50 candle-power lamps, placed in the middle of each of the three principal arches. The fittings will be of wrought iron. Each of the transepts will contain two similar fittings. At the crossing there will be on each of the four main columns eight 50 candle-power lamps. In the choir there will be clusters of three lamps at each of the four arches. The morning chapel will be lit with four clusters of three lights. The total candle-power available in the cathedral will be about 5,000. It is proposed to replace the existing five large hydraulic engines for the organ-blowing by electrically-driven rotary blowers. The Corporation electric supply is being used.

THE L.C.C. AND HOUSING.

THE following report of the Housing of the Working Classes Committee of the London County Council, relative to working-class dwellings demolished and built during the year 1908, was adopted at the meeting last week:—

We submit as a separate document a return which has been prepared showing the net addition to working-class accommodation provided in the county of London and in the adjacent districts during the year 1908. The returns for 1906, 1907 and 1908 deal with a larger area than the returns prepared for previous years, thirteen additional urban districts having been included of which the principal are Barking Town, Enfield, Hanwell, Heston and Isleworth, Ilford, Southall-Norwood and Southgate. The return also shows the number of rooms and tenements contained in the houses, as well as the average weekly rents charged per tenement and per room.

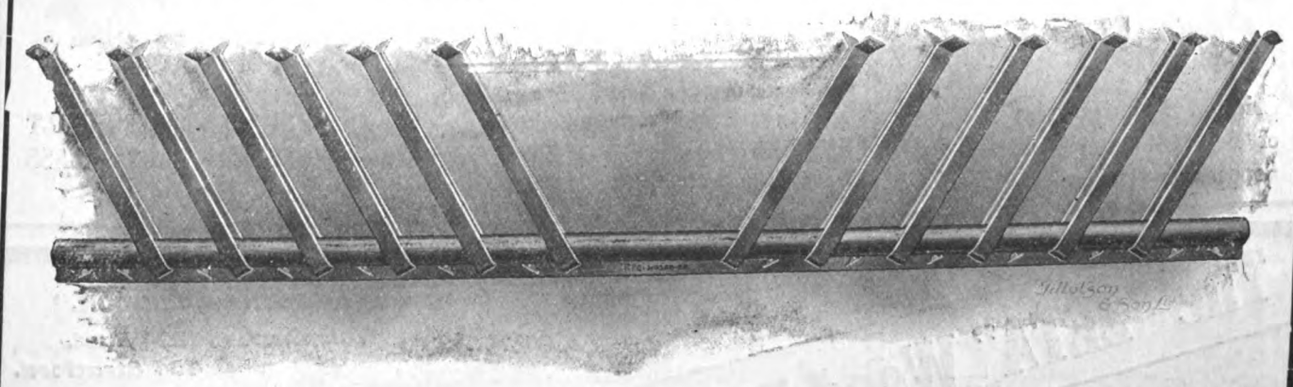
The information relating to the county of London has been obtained by means of the provisional valuation lists of each parish, and the houses suitable for working-class accommodation have been ascertained by local investigation. As regards the extra-London districts, the town clerks of the boroughs and the clerks of the councils of the various urban and rural districts have either supplied statistics or given facilities for obtaining the necessary information.

The several parishes and metropolitan boroughs in London and the boroughs, parishes and urban districts outside have, for the purposes of the return, been grouped into five sections—(i.) western, (ii.) northern, (iii.) eastern, (iv.) south-eastern, (v.) south-western. Each section is sub-divided into three zones, which are shown on a map which accompanies the return. The central zone or area, where very few new working-class dwellings are now being built, comprises the City of London, the City of Westminster, the Metropolitan Boroughs of Holborn, Finsbury, Shoreditch, Bethnal Green, St. Marylebone, Stepney, Bermondsey, and Southwark, and the northern part of Lambeth and the southern part of St. Pancras. The next zone, where considerable working-class accommodation is still being provided, comprises the remainder of the county of London; while extra-London, where the greatest addition to the working-class accommodation is now taking place, comprises the

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boroughs, urban districts and parishes in the immediate neighbourhood of the county of London.

The number of rooms provided and demolished in the course of the year may be summarised as follows:—

	Central Zone.	Rest of London.	Extra London.	Total Area.
Number of rooms provided ...	2,182	8,205	22,195	32,582
Number of rooms demolished ...	2,637	1,324	380	4,341
Net addition	−545	6,881	21,815	28,241

One common lodging-house containing fifty-two beds was demolished during the year. The net addition to the number of rooms in the whole area in the years 1906 and 1907 was 52,755 and 40,017 as compared with 28,241 in 1908. The figures show that the diminution in the rate at which working-class accommodation is increasing has become more marked during 1908, the net addition for the year, both in the county of London and in the extra-London districts, being less than any year since 1902, when this record was first obtained. In the county of London the net addition to the number of working-class rooms amounted to only 6,426 in 1908, as compared with 21,475 in 1903. In London north of the Thames only 382 rooms were added during 1908, for while a considerable amount of accommodation was provided in Fulham, Hammersmith and Holborn, this was to a great extent counterbalanced by demolitions in St. Marylebone, St. Pancras and Stepney. South of the river a considerable amount of building is still proceeding in the outlying districts of Wandsworth, Lewisham, Greenwich and Woolwich. No dwellings for the working classes were provided during the year in the City of London or in the metropolitan boroughs of Hampstead, Paddington and Stoke Newington. Of the 32,582 rooms provided during the year 858 have been provided by the Council and 216 by other local authorities. Comparing the figures for the smaller area dealt with in the earlier years, the most striking feature is the falling off in the accommodation provided in the eastern and south-eastern sections. In the eastern section the number of rooms provided in 1908 was only 4,875, as compared with 15,716 in 1902, while in the south-eastern section 3,820 rooms were provided in 1908 and 8,627 in 1902.

The extent to which the new accommodation for the working classes has sufficed to meet the increase in the working-class population is a matter which cannot be ascertained with any great degree of accuracy. The number of persons which the new houses will accommodate may be estimated on a basis of an average of 1½ persons per room in London, and an average of 1¼ persons per room in the extra-London area. If this basis be adopted it may be stated that in the whole area accommodation for 36,856 persons has been added in the course of the year. The increase in population during the year, taking the Registrar-General's estimate for the County of London, and estimating the increase in the extra-London districts on the basis of the census figures for the period 1891-1901, would amount to 105,424. On the assumption that the increase in the working-class population amounted to two-thirds of the total, such increase would be 70,283 persons, as compared with 36,856 persons, for whom housing accommodation was provided, as estimated above. In previous years, however, there was a considerable surplus of accommodation provided, and the figures for the period from 1902 to 1908 inclusive, worked on a similar basis, indicate a total deficiency of working-class accommodation for 8,945 persons. In considering whether the number of working-class houses is adequate to provide for the increase in population, it should be borne in mind that there is at the present time a large surplus of middle-class houses, many of which will doubtless in course of time be made available for occupation by persons of the working class.

The rents charged for the new accommodation indicate practically no change from the rents ruling in 1907. For the central area the average weekly rent per room is 3*s.* 1½*d.*, for the rest of London 2*s.* 7*d.*, and for the surrounding districts 2*s.* 2¼*d.*

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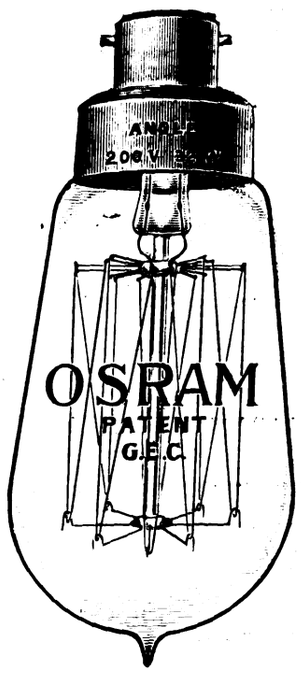
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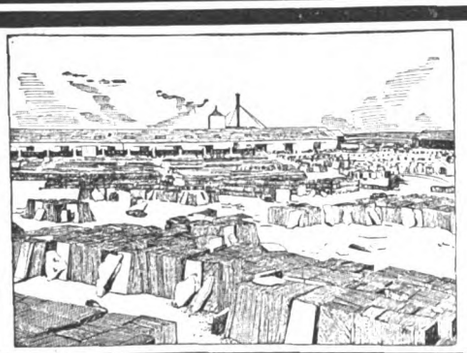
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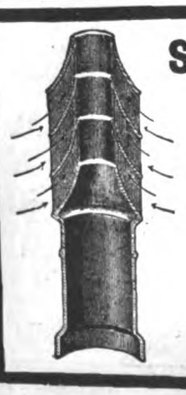
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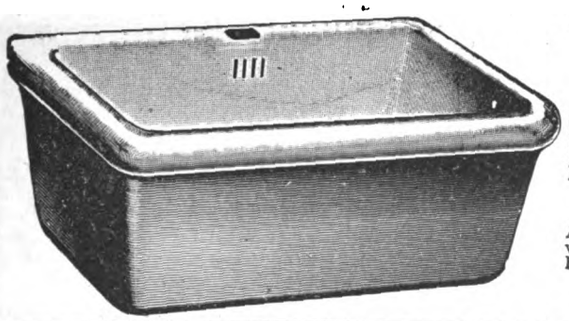
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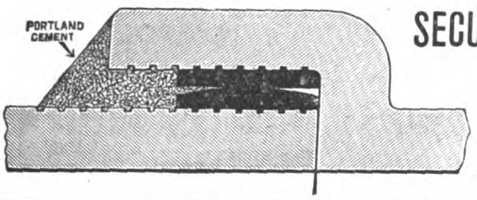
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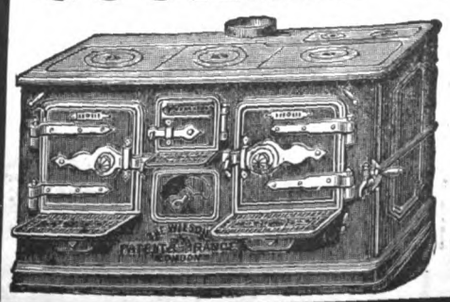
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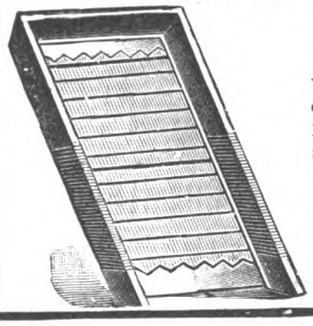
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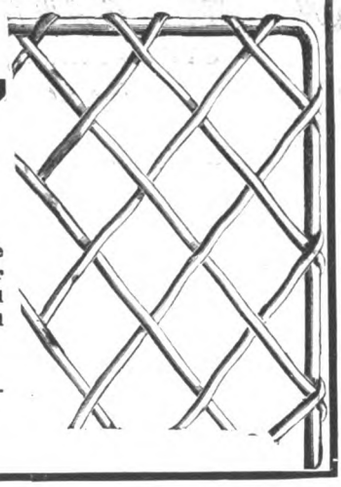
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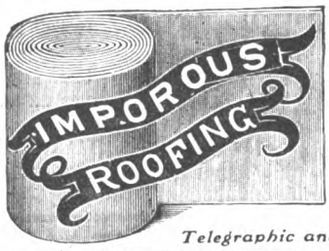
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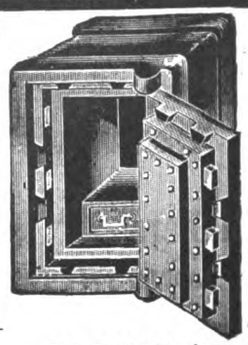
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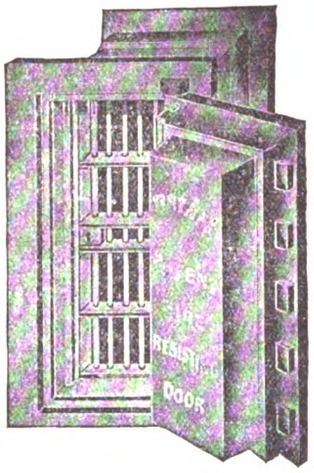
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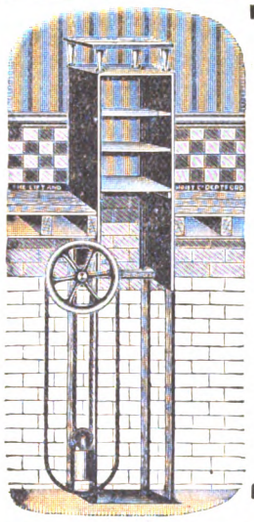
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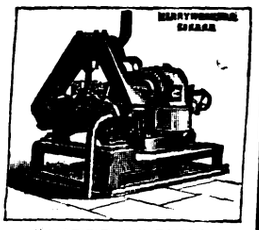
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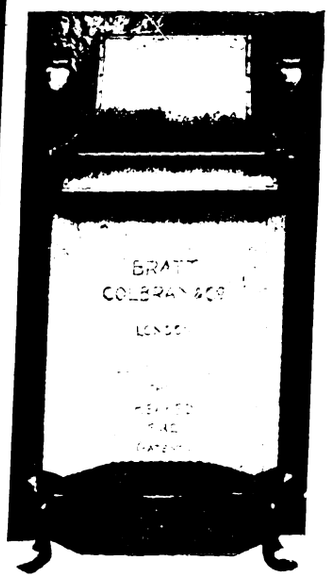
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Architect and Contract Reporter.

FRIDAY, NOV. 12, 1909.

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

CRADLEY HEATH.—The Trustees of the United Methodist Church invite architects to submit designs on approval for Sunday school, with seating accommodation for about 1,000. For particulars apply to Mr. C. Clee, Cradley Heath, Staffs.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

IRELAND.—Dec. 1.—The Tralee Urban District Council invite designs for a proposed Carnegie library and technical school, to cost not more than 4,500*l.* Premiums of 20*l.* and 10*l.* The Town Clerk, Tralee, Ireland.

LEEDS.—Dec. 18.—The education committee invite architects practising in Leeds to submit designs for proposed training college for teachers, Kirkstall Grange, Far Headingley. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist the committee. Deposit 2*l.* 2*s.* Mr. James Graham, Secretary for Education, Education Department, Leeds.

MINEHEAD.—Dec. 11.—For a shelter with cloak-room and lavatories, on the beach at Minehead, Somerset, to cost not more than 3,000*l.* Deposit 5*s.* Premium 20*l.* The premiated plans to become the property of the Council; or, in event of the architect carrying out the work, the premium will merge in the commission. Mr. L. C. Webber-Incledon, clerk, 16 Park Street, Minehead, Somerset.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

WORKINGTON.—Nov. 30.—The Cumberland education committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the borough of Workington, Cumberland, for about 300 pupils of both sexes. Deposit 1*l.* 1*s.* Mr. C. Courtenay Hodgson, secretary, The Courts, Carlisle.

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CONTRACTS OPEN.

ALDEBURGH.—Nov. 24.—For the removal of the upper portion of the existing brick water tower at Aldeburgh, including the roof, cast-iron tank holding 11,000 gallons, girders and internal fittings, and the construction of a new steel tank to contain 35,000 gallons upon steel columns and joists fixed inside the tower, and rebuilding the walls of the tower to a greater height, together with the connections to the mains, staircases, and other works, for the Corporation. Deposit 2*l.* 2*s.* Messrs. J. Mansergh & Sons, engineers, 5 Victoria Street, Westminster.

BARNBY MOOR.—Nov. 16.—For the whole of the various trades required in erection of a house at Barnby Moor, near Retford. Send names by November 16 to Mr. G. A. Wilson, architect, Hartshead Chambers, Sheffield.

BARROW-IN-FURNESS.—Nov. 17.—For builders', joiners', plumbers' and other work in alterations to the storerooms at the workhouse, Roose. Mr. H. T. Fowler, A.R.I.B.A., Cornwallis Street, Barrow-in-Furness.

BLYTH.—Nov. 15.—For erection of schools near Morpeth Road. Deposit 2*l.* 2*s.* The Education Offices, Bridge Street, Blyth, Northumberland.

BURY ST. EDMUNDS.—Nov. 20.—For the provision of a cookery room, assembly hall, and alterations to the County school and P.T. Centre. Mr. A. Ainsworth Hunt, building inspector, Shire Hall, Bury St. Edmunds.

CROOK.—For the erection and completion of a pair of semi-detached villas at Crook, Durham. Mr. Albert H. Fennel, architect and surveyor, Bishop Auckland.

ERDINGTON, NEAR BIRMINGHAM.—Nov. 30.—For the erection of the following buildings, for the Erdington Urban District Council, viz.:—Public lavatories, Orphanage Road and Woodend Road; tramways waiting-rooms and lavatories at Chester Road; open-air swimming-baths, boathouse, landing stage, &c., small bridge spanning stream, and shelters at the new reservoir park. Deposit 5*l.* Mr. Herbert H. Humphries, engineer and surveyor, the Council House, Erdington.

EVESHAM.—Nov. 16.—For the excavating, levelling, and forming the site of playground at the Grammar schools in course of building on Greenhill, and stocking-up of the hedge-row and piping the ditch bounding the grounds on the Inches Lane side. Governors' surveyor, Mr. R. Webb, 4 North Terrace, Evesham.

HASWELL.—Nov. 16.—The Durham County Council invite sole tenders for erection of (1) Haswell School (810 scholars), Mr. W. Rushworth, Shire Hall, Durham; (2) for removal of iron school at Harlow Green to Easington Colliery. Mr. F. E. Coates, Shire Hall, Durham.

HEAVITREE AND NEWTON ABBOT.—Nov. 19.—For new Council schools as follows, for the Devon County Education Authority:—At Heavitree, Ladysmith Road, for 360 children; and Newton Abbot, Wolborough, for 240 children. Deposit 1*l.* 1*s.* each. Send names to the County Architect (Education), 1 Richmond Road, Exeter.

HEBDEN BRIDGE (YORKS).—Nov. 15.—For erection of mortuary at Lewisholme. The Surveyor's Office, the Hebden Bridge Urban District Council.

HEYWOOD.—Nov. 19.—For the various works required in erection of twenty houses in Mount Street and Newbold Street, Heywood, Lancs. Messrs. Sutcliffe & Sutcliffe, architects, Todmorden.

HULL.—Nov. 18.—For the erection of a school in Sidmouth Street. Deposit 2*l.* 2*s.* Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

IRELAND.—Nov. 16.—For carrying out improvements to the workhouse infirmary, Strabane. Mr. William J. Ingram, clerk to the Guardians, Strabane, Ireland.

LANCHESTER.—Nov. 17.—For the conversion of lodging-house into two houses, for the Lanchester Board of Guardians. Mr. G. T. Wilson, architect, 22 Durham Road, Blackhill.

LEAMINGTON.—Nov. 29.—For the execution of the following work for the Town Council, viz.:—(1) Excavation, concrete and brickwork required for the erection of a greenhouse, 100 feet by 12 feet; and (2) joiners', glaziers' and painters' work needed for the completion of same. The Borough Engineer, Town Hall.

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LEEDS.—Nov. 16.—For the whole of the work required in alterations, &c., of the Queen's Lodging-house, East Street, and in the alterations of houses into shops, Beeston Road. Mr. W. T. Lancashire, city engineer, Leeds.

LEEDS.—Nov. 18.—For the whole or any portion of the work required in connection with additions and alterations to the divisional police-station, Millgarth Street. Deposit 1*l.* 1*s.* Mr. Archibald Neill, F.R.I.B.A., 38 Park Row.

LIVERPOOL.—Nov. 15.—For bricklayer's work in construction of area walls and keeper's quarters at the new chief offices for the Royal Liver Friendly Society, Liverpool. Deposit 1*l.* Mr. W. Aubrey Thomas, architect, 14 Dale Street, Liverpool.

LONDON.—Nov. 16.—For repairs to the relief hall of the administrative offices, Bishop's Road, Victoria Park, N.E. Deposit 2*l.* 2*s.* Mr. D. Thomas, clerk, Bethnal Green Guardians' Administrative Offices, Bishop's Road, Victoria Park, N.E.

LONDON.—Nov. 16.—For the following works, for the Acton Urban District Council:—(a) Erection of a thirty-bed ward pavilion at the Isolation Hospital, Wales Farm Road; (b) making-up and paving passages, Valetta Road. Mr. D. J. Ebbetts, surveyor, 57 High Street, Acton, W.

LONDON.—Nov. 16.—For the erection of a permanent school to accommodate 1,420 children, on the Crowland Road site. Deposit 2*l.* 2*s.* Send names to Mr. G. E. T. Laurence, A.R.I.B.A., 22 Buckingham Street, Adelphi, W.C.

LONDON.—Nov. 17.—For the extension of the branch post office and sorting office, Notting Hill, W. Deposit 1*l.* 1*s.* Mr. J. Wager, A.R.I.B.A., H.M. Office of Works, Carlisle Place, S.W.

LONDON.—Nov. 23.—For the extension of the Royal Courts of Justice. Deposit 1*l.* 1*s.* Sir Henry Tanner, I.S.O., F.R.I.B.A., H.M. Office of Works, &c., Storey's Gate, S.W.

LONDON.—Nov. 24.—For the demolition of cottages Nos. 35 to 50 (inclusive), Crozier Terrace, High Street, Homerton, N.E., and the erection of boundary walls, for the Guardians of Hackney Union. Mr. Frank R. Coles, clerk, Sidney Road, Homerton, N.E.

LOUGHBOROUGH.—Nov. 18.—For alterations at the Hickling's School, Ashby Road, for the Loughborough education committee. Deposit 1*l.* 1*s.* Messrs. Barrowcliff & Allcock, architects, Town Hall Chambers.

MANCHESTER.—Nov. 22.—For alterations and additions to messrooms, sheds, &c., at the Pond Street Highways Yard. Deposit 1*l.* 1*s.* The City Architect, Town Hall, Manchester.

MEDOMSLEY.—Nov. 15.—For new hall and other alterations at Medomsley branch, for the Annfield Plain Industrial Co-operative Society, Ltd. Mr. Geo. Thos. Wilson, architect, 22 Durham Road, Blackhill, Durham.

MERTON.—Nov. 15.—For erection of a block of five cottages and a block of eight cottages in Mill Road, Merton Abbey Estate, High Street, Merton, S.W. Mr. Henry R. G. S. Smallman, A.R.I.B.A., 8 Queen Street, Cheapside, E.C.

MOGERHANGER.—Nov. 24.—For erection of a new Council school at Mogerhanger, Bedfordshire. Send names by November 14 to Mr. H. Leete, Monthermer, Huntingdon.

MORECAMBE.—Nov. 18.—For the construction of underground conveniences on Promenade, near clock tower. Deposit 2*l.* 2*s.* Mr. J. W. Hipwood, A.M.I.C.E., borough surveyor, Morecambe.

PLYMOUTH.—Nov. 20.—For erection of stabling for about thirty horses. Messrs. Truscott & Sons, Octagon Mews, Plymouth.

PLYMOUTH.—Nov. 23.—For the supply, delivery, and fixing of No. 4 ornamental shelters in the pleasure grounds. Tenders to be accompanied by designs, detail drawings, and specification. Mr. James Paton, borough engineer and surveyor, Municipal Offices, Plymouth.

PRESTWICH.—Nov. 26.—For erection of an elementary school at Prestwich, near Manchester, to accommodate 548 scholars, with special rooms for manual instruction and cookery and laundry work. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

RAINHILL.—Nov. 25.—For erection of six cottages at the County Asylum, Rainhill, Lancashire. Deposit 2*l.* 2*s.* The engineer's office, Rainhill.

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STANLEY.—Nov. 22.—For erection of Council offices in Front Street, Stanley, Durham. Deposit 2*l.* 2*s.* Mr. John W. Wilson, architect, 3 Coleshill Street, Sutton Coldfield, Warwick.

SWABY.—Nov. 15.—For the erection of three cottages and a set of farm buildings and alterations to existing buildings on the Glebe Farm, Swaby, Lincs. Send names to Messrs. Mortimer & Son, architects, Lincoln.

WAKEFIELD.—Nov. 19.—The West Riding Education Committee invite whole or separate tenders for the following work:—Laughten-en-le-Morthen new school, Wickersley new school (builder, joiner, plasterer, slater, plumber, painter). Deposit 1*l.* in each case. The West Riding Architect, County Hall, Wakefield.

WALES.—Nov. 16.—For extensions and alterations at the Bethel Primitive Methodist Chapel, Garndiffaith, near Pontypool. Mr. A. Gordon Babbidge, architect and surveyor, Clarence Chambers, Pontypool.

WALES.—Nov. 22.—For re-roofing and making alterations to Capel Bangor Church, near Aberystwyth. Mr. G. T. Bassett, A.R.I.B.A., Aberystwyth.

WALES.—Nov. 22.—For the construction of a large swimming-bath, boiler-house and other buildings, for the Powell's Tillery Workmen's Institute, Abertillery. Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

WALES.—Nov. 22.—For erection of thirty-four houses at Pontymister, for the Risca Urban District Council, Mon. Deposit 2*l.* 2*s.* Mr. A. J. Dardis, Council offices, Risca, Mon., engineer to the Council.

WALES.—Nov. 24.—For erection of twenty-eight houses at Tynycae, Penygraig, Rhondda Valley, for Messrs. The Tynycae Building Club. Messrs. W. M. Lewis & T. Naunton Morgan, architects and surveyors, Tonypandy and Pontypridd.

WALGRAVE.—Nov. 13.—For erection of Council school, Walgrave, Northants. Send names to Messrs. Law & Harris, architects, 1 Sheep Street, Northampton.

WILLINGDON, &C. (SUSSEX).—Nov. 20.—For all or any of the following works, for the East Sussex education committee, viz.: (1) Erection of a new school and master's house at Willingdon; (2) erection of a new school and master's house at Broad Oak, Heathfield; and (3) alterations to the girls' and infants' school, South Road, Newhaven. Send names and addresses to Mr. F. J. Ward, county surveyor, County Hall, Lewes.

WINCHESTER.—Nov. 17.—For erection of three shops in Jewry Street. Mr. J. Ashton Sawyer, chartered surveyor, 59 High Street, Winchester.

WINCHESTER.—Nov. 13.—For erection of a high school boarding house. Send names to Messrs. Colson & Nisbett, architects, 45 Jewry Street, Winchester.

WORKINGTON.—Nov. 20.—For the execution of the several works required in erection of an extension of the meter house at the Stainburn Reservoir. Mr. H. B. Williams, borough engineer and surveyor, Town Hall, Workington.

A SCHEME is being promoted by the Worksop Co-operative Society for the creation of a "garden city." A site of about six acres has been acquired on the east side of the town, a locality hitherto undeveloped, and there the society propose to erect nearly 100 houses in pairs.

A BUILDING scheme is in process at Gourock, in view of the coming of torpedo factory workers from Woolwich next year. Several acres have been taken off by a Greenock syndicate on the farm of Cove, overlooking Cardwell Road, and it is intended to erect fifteen large tenements.

A MASS meeting of auctioneers and estate agents and others interested in real property will be held at the Cannon Street Hotel, London, on Thursday, November 18, to protest against the land clauses in the Budget. It is expected that a similar meeting of builders' merchants will shortly follow.

THE Fylde Water Board have resolved that a Bill be promoted in the ensuing session of Parliament for the construction of a covered service reservoir, water tower, and other works on land at or near Warbreck Hill, Blackpool; a 24-inch main at Upper Rawcliffe-with-Tarnacre; an equilibrium basin in Barnace-with-Ronds; for stopping up or diverting roads and footpaths; the acquisition of lands; the construction of additional conduits or line of pipes, and other powers.

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TENDERS.

BODMIN.

For erection of proposed new East Cornwall Hospital in Rhind Street. Mr. MORLEY B. COLLINS, architect, Redruth.

Trehane & Son	£3,130 0 0
Ham	2,735 0 0
Grose	2,700 0 0
Lapthorne & Co.	2,598 0 0
Brown & Son	2,545 0 0
Hodge	2,475 0 0
Stanbury	2,449 0 0
Brown Bros.	2,443 0 0
BENNETT, Bodmin (*accepted*)	2,225 0 0

BRIXHAM.

For additions and alterations to the town hall. Mr. W. VANSTONE, C.E., Palace Chambers, Paignton.

Roberts	£820 0 0
Bovey & Sons	790 0 0
Goss	742 0 0
Webber & Sons	699 3 3
Hazlewood Bros., Brixham (*recommended*)	679 19 0

CHISLEHURST.

For works, for the Urban District Council.

Walden Road.

Muirhead & Co.	£1,990 8 6
E. & E. Hes	1,981 4 6
Peill & Sons	1,965 0 0
Adams	1,934 0 0
Trueman & Co.	1,799 0 0
Mowlem & Co.	1,796 0 0
Wood & Sons	1,785 4 1
WOODHAM & SONS, Catford (*accepted*)	1,739 0 0

Queen's Road.

WOOD & SONS, Swanley (*accepted*)	178 15 5

Park Road.

WOOD & SONS, Swanley (*accepted*)	395 19 3

CHESTERFIELD.

For the construction of the sewage works at Barlow.

Sykes	£406 9 2
Holmes & Sons	273 8 8
Kirk	264 17 0
Bateman	257 2 4
Glithero	256 13 10
BEIGHTON, Hepthorne Lane (*accepted*)	244 5 6
Auld	244 4 6

EAST KIRKBY.

For pair of cottages, Welbeck Street. Mr. W. H. WOODS, architect, Long Eaton, near Nottingham.

Coleman & Blackburn	£450 0 0
Stowe	442 10 0
Bains	440 0 0
Green	415 0 0
Limb	410 10 0
Hibbert	405 0 0
Tate & Son	394 10 0
HOOLE, Kirkby-in-Ashfield (*accepted*)	389 10 0

HAILSHAM.

For the conversion of the Brewer's Arms into a motor garage, for Mr. A. F. Smith. Mr. ARTHUR H. BURTENSHAW, P.A.S.I., architect, 7 Bolton Road, Eastbourne.

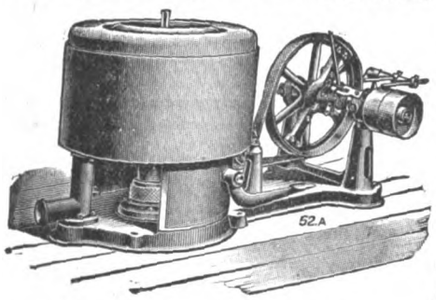
Phillips	£285 10 0
Rich	264 10 0
Cornford	254 0 0

HORNCASTLE.

For the construction of a 40,000 gallon brick reservoir and filters, and laying cast-iron and stoneware pipes at the Cawkwell waterworks, for the Horncastle Water Company. Messrs. G. & F. W. HODSON, engineers, Loughborough.

Hyslop	£1,597 17 2
Pattinson & Sons	1,449 0 0
Hensman & Son	1,254 10 0
Langley	1,162 13 0
Wickstead & Beardsell	1,062 1 7
Moss & Sons, Loughborough (*accepted*)	1,040 0 0
Brebner & Co.	950 3 0

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MOTHERWELL.
CATALOGUES FREE



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Guildford Street, LEEDS.
MAKERS OF THE
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THORNCLIFFE IRONWORKS,
— Near SHEFFIELD. —

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FITZROY WORKS
352 TO 364 EUSTON R^D
LONDON

The original introducers of the Hot Water Cylindrical Tanks.

Illustrated Sheet, showing application of our Hot Water Cylindrical Tanks, sent on request.

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KINGSWOOD.

For extensions to boot and shoe factory at Kingswood, Bristol. Mr. W. H. Watkins, A.R.I.B.A., architect, Bristol.

Ridd & Sons	£1,349 0 0
Clarke & Sons	1,220 0 0
Edwards Bros.	1,210 0 0
Lovell & Sons	1,179 10 0
Cowlin & Sons	1.179 0 0
Adams & Jefferies	1.170 0 0
Marsh & Stone	1.150 0 0

LEYTON.

For installing the electric light and hot-water heating apparatus at Canterbury Road schools. Mr. W. Jacques, A.R.I.B.A., architect, 2 Fen Court, Fenchurch Street, E.C.

Hot-water heating.

Tamplin & Makovski	£670 0 0
Berry & Son	548 0 0
Key	548 0 0
Pemberton, Arber & Co.	490 0 0
Halsey	481 15 6
Akers & Co.	455 0 0
Wembley Heating Co.	442 0 0
Simmons	440 0 0
Wenham & Waters	439 0 0
Spry & Co.	437 0 0
Fryer & Co.	435 10 0
Barnards	415 7 6
Brightside Foundry and Engineering Co.	397 0 0
Beaven	392 0 0
Russell & Co.	392 0 0
G. & E. Bradley	371 0 0
Cannon & Sons	363 0 0
Cannon & Hefford	359 0 0
Davies	331 0 0
General Iron Foundry Co.	266 0 0
Watkin & Son	263 15 0
Weston & Sons, London (*accepted*)	249 10 0

LEYTON—*continued.*

Electric light.

British Westinghouse Electric M. Co.	311 18 0
Cannon & Sons	273 0 0
Tamplin & Makovski	260 0 0
Rowland & Hulton	256 0 0
Myhre, Francis & Co.	253 0 0
Pemberton, Arber & Co.	246 0 0
King	239 0 0
Wenham & Waters	220 0 0
Smeeton & Page	220 0 0
Fryer & Co.	220 0 0
Halsey	210 10 6
Garratt, Hunt & Co.	210 0 0
Beaven	205 0 0
Simmons	193 0 0
Whitehead	189 0 0
Toms & Sons	183 10 0
Newbald & Co.	177 0 0
Muir, Watts & Co.	169 5 0
Weston & Sons	163 14 0
Johnson & Phillips, Charlton (*accepted*)	143 9 6

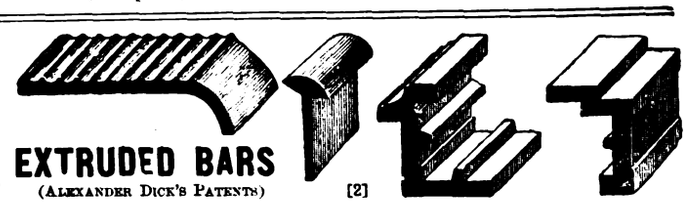
LONDON.

For the enlargement of the Essendine Road school, Paddington.

Smith & Sons	£10,055 0 0
Waring & White	10,011 0 0
Garrett & Son	9,968 0 0
Hawkins & Co.	9,664 0 0
Treasure & Son	9,661 0 0
Wallis & Sons	9,626 0 0
Johnson & Co.	9,612 0 0
Spencer, Santo & Co.	9,567 0 0
Kearley	9,439 0 0
Patman & Fotheringham	9,385 0 0
Lovatt	9,332 0 0
J. & M. Patrick	9,045 0 0
Hall, Beddall & Co., Waterloo Bridge, (*accepted*)	9,040 0 0

The DELTA METAL COMPANY, LIMITED,
East Greenwich,
London, S.E.





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In BRASS, BRONZE, and other Alloys.

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ASPHALTE CONTRACTORS,
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Seyssel, - Limmer, Vorwohle, Sicilian, Lava and Acid - - Resisting Asphaltes.

WM. DUNCAN TUCKER & SONS, LD.
TELEPHONE 2 TOTTENHAM. TOTTENHAM. N. TELEGRAMS "HORTICOLE LONDON"
JOINERY OF EVERY DESCRIPTION
MOULDINGS TO ANY DESIGN

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LONDON—*continued.*

For intercepting sewer, Contract No. 1, Brent District drainage, for the Willesden District Council.

	6 ft. by 4 ft.	5 ft. by 3 ft. 4 in.
Dickson	£75,518 2 6	£67,154 3 5
Smith & Co.	71,329 17 2	62,270 0 11
Monk & Newell	68,653 3 2	60,811 1 7
Jackson	66,989 12 2	59,698 11 2
Adams	66,340 10 0	57,975 2 4
Latter	65,200 12 3	56,936 5 9
Pearson & Son	64,467 0 8	58,613 2 11
Wickstead & Beardsell	63,181 9 9	57,094 11 9
Nowell	60,706 12 5	53,205 5 11
Griffiths & Co.	58,400 0 0	52,892 0 0
Nowell & Sons	57,884 6 9	52,032 3 9
Bell & Sons	57,821 0 0	50,796 0 0
Shellabear & Sons	57,595 13 6	53,095 5 2
J. & T. Binns	57,147 8 11	50,554 6 1
Clements, Knowling & Co.	56,453 0 0	49,552 0 0
Price & Co.	55,942 18 0	50,597 12 10
Johnson & Langley	55,045 0 2	48,190 0 1
Westminster Construction Co.	54,222 5 8	49,361 14 10
Bower Bros.	54,355 0 0	48,185 0 0
McAlpine & Sons	54,106 9 9	47,513 9 10
Paterson	53,823 0 2	47,826 14 11
Muirhead & Co.	53,781 6 7	48,630 14 11
Macdonald & Deakin (*too late*)	52,863 3 4	46,377 0 0
Ford	52,570 0 0	46,982 0 0
Brebner & Co.	52,262 1 10	46,258 9 4
Moran & Son	50,398 0 0	43,900 0 0
Bentley & Son	50,009 6 3	44,465 11 2
Underwood & Bro., Dukinfield, Cheshire (*accepted*)*	*49,547 7 1	43,986 17 3
Whyte & Co.	—	50,808 14 5

For the enlargement of Canonbury Road school, Islington.

Treasure & Son	£9,755 0 0
McLaughlin & Harvey	9,407 10 4
Kirk & Randall	9,057 0 0
McCormick & Sons	8,959 0 0
Lole & Co., Chelsea (*accepted*)	8,519 0 0

LONDON—*continued.*

For the erection of higher school, Morpeth Street, Bethnal Green, N.E.

Todd & Newman	£11,235 0 0
Symes	10,201 0 0
Clarke & Bracey	10,147 0 0
Perry & Co.	10,120 0 0
Harris	10,102 0 0
F. & T. Thorne	9,847 13 3
Johnson & Co.	9,821 0 0
Dabbs & Son	9,749 0 0
Kirk & Randall	9,618 0 0
McCormick & Sons	9,547 0 0
Lawrence & Son	9,393 0 0
J. & C. Bowyer, Upper Norwood (*accepted*)	9,387 0 0

For the erection of mortuaries and post-mortem room, for the Poplar Borough Council. Mr. Harley Heckford, borough surveyor, Poplar.

Brown	£2,350 0 0
Newell & Lusty	2,172 0 0
Leslie & Co.	2,119 0 0
Reason	2,079 0 0
Harper	2,050 0 0
Abbott & Charlton	1,991 8 3
Hyde & Co.	1,991 0 0
Gathercole Bros.	1,990 0 0
Symes	1,946 0 0
Borough Surveyor (*accepted*)	1,912 19 4
F. & G. Foster	1,867 0 0
Lawrence & Sons	1,865 0 0
Griggs & Son	1,849 0 0

For the erection of higher school, St. Mark's Road, Kensington.

F. & H. F. Higgs	£11,840 0 0
Soole & Son	10,752 9 5
Triggs	10,368 10 0
Kearley	10,337 0 0
Johnson & Co.	10,304 0 0
J. & C. Bowyer	10,293 0 0
J. & M. Patrick, Wandsworth (*accepted*)	9,579 0 0

DURESCO

THE KING OF WATER PAINTS.

The FIRST in the Field. The FOREMOST ever since.

THE SILICATE PAINT CO.

Made and sold a Water Paint in 1875.

30 Years' Experience has stamped

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SOLE MANUFACTURERS—

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LONDON—*continued.*

For the erection of a school for physically defective children in Venetian Road, Norwood.

Rice & Son	£5,586	0	0
Parker & Sons	4,808	0	0
Mitchell & Son	4,785	0	0
Akers & Co.	4,765	0	0
Wallis & Sons	4,644	0	0
Hollingsworth	4,594	0	0
Johnson & Co.	4,571	0	0
J. & C. Bowyer	4,531	0	0
Triggs	4,529	0	0
Marsland & Sons	4,510	0	0
Longley & Co.	4,426	0	0
Smith & Sons	4,322	0	0
J. & M. PATRICK, Wandsworth (*accepted*)	4,206	0	0

For the enlargement of the Amberley Road school, Paddington.

Garrett & Son	£19,444	0	0
Davies	19,337	0	0
Treasure & Son	18,533	0	0
Johnson & Co.	18,361	0	0
Spencer, Santo & Co.	18,302	0	0
J. & M. Patrick	18,131	0	0
Hawkins & Co.	17,960	0	0
Patman & Fotheringham	17,891	0	0
Lovatt	17,456	16	0
Kearley	17,420	0	0
Wallis & Sons	17,373	0	0
J. & C. BOWYER, Upper Norwood (*accepted*)	17,287	0	0

For the enlargement of the Maryon Park school, Woolwich.

Stapleton & Sons	£6,401	0	0
Marsland & Sons	5,567	0	0
F. & T. Thorne	5,547	0	10
Holloway	5,471	0	0
Leng	5,405	0	0
Appleby & Sons	5,404	0	0
Harris	5,401	0	0
KIRK & RANDALL, Woolwich (*accepted*)	5,195	0	0

LONDON—*continued.*

For the erection of higher school, The Reay, Brixton.

Lathey Bros.	£7,656	0	0
F. & H. F. Higgs	7,330	0	0
Downs	7,297	0	0
King & Son	7,291	0	0
W. Smith & Son	7,206	11	5
Whitehead & Co.	7,143	0	0
J. Smith & Sons	7,137	0	0
Akers & Co.	7,124	0	0
Parker & Sons	6,948	0	0
Johnson & Co.	6,943	0	0
Garrett & Son	6,918	0	0
Appleby & Sons	6,885	0	0
Triggs	6,838	0	0
Leng	6,827	0	0
Marsland & Sons	6,809	0	0
J. & C. Bowyer	6,644	0	0
HOLLIDAY & GREENWOOD, Brixton (*accepted*)	6,368	0	0

For paving and sewer, &c., works in connection with the widening of Belvedere Road between Westminster Bridge Road and Guildford Street, for the London County Council.

Kavanagh & Co.	£4,764	5	3
Wheeler & Co.	4,619	2	7
F. & H. F. Higgs	4,476	0	0
Price & Reeves	4,393	15	3
Woodham & Sons	4,168	10	3
Muirhead & Co.	4,168	6	2
Ford	3,758	1	4
Mowlem & Co.	3,717	7	9
Paterson, Camden Town (*recommended*)	3,283	2	7
Chief engineer's estimate	3,967	8	0

For the erection of manual training, laundry and housewifery centres, Berner Street, St. George-in-the-East.

Snewin Bros. & Co.	£3,422	0	0
Kent	3,264	0	0
Perry & Co.	3,257	0	0
Treasure & Son	3,201	0	0
Price	3,157	0	0
Newell & Lusty	3,148	0	0

JOHN SMITH & SONS,
Midland Clock Works, Derby.
Telegraphic address: "Clocks, Derby." Telephone No. 599.
CHURCH AND PUBLIC CLOCKS.
Makers of Clocks and Chimes for St. Paul's Cathedral, Beverley Minster, Truro Cathedral, Thurles Cathedral, Belfast Assembly Hall, and many others to Lord Grimthorpe's designs.
In 1897, writing to Vicar of Minchinhampton, Lord Grimthorpe said: "Smith of Derby will clock you in the best way and as near eternity as possible."

Church and Turret Clocks
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W. F. EVANS & SONS,
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Every Description of Tower Clocks, with or without Chimes, to suit all size Bells. Also Railway, School, Office, House, & Marine Clocks, &c.
Estimates Free. *Estd. 1805.*

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HEATING By High and Low Pressure Steam and :: Hot Water ::
Independent Hot Water Supply on Improved Lines.
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MANUFACTURERS OF HIGH CLASS JOINERY & MOULDINGS TO ARCHITECTS DESIGNS
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BLACKBURN, STARLING & CO.
LIMITED,
Manufacturers and Erectors of Improved
ROPE & TAPE
LIGHTNING CONDUCTORS,
Gresham Works,
NOTTINGHAM,
DUBLIN & HANLEY.
Chimney Columns
Pointed, Hooped, Raised and Repaired. No stoppage of Works required.
Colliery Signals
AND
Electric Bells
Supplied and Fixed. Estimates Free. Distance no object.
Telegrams, 'Blackburn, Nottingham.'
Telephone No. 288, Nottingham.

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LONDON—*continued.*

Chessum & Sons	3,141 19 6
Stevens & Sons	3,095 0 0
Wallis & Sons	3,072 0 0
Symes	3,044 0 0
Harris	2,993 0 0
Kirk & Randall	2,980 0 0
F. & T. Thorne	2,950 2 9
Leng	2,944 0 0
J. & C. Bowyer, Upper Norwood (*accepted*)	2,866 0 0

MELBOURNE.

For alterations and improvements at the Kendrick Mills, Melbourne, near Derby. Mr. F. S. Antliff, architect, Draycott, near Derby.

Barton	£333 16 6
Calow	333 13 0
Fitchett, Melbourne (*accepted*)	329 15 6

NEWCASTLE.

For the erection of St. Barnabas Parochial Building. Mr. A. B. Plummer, F.R.I.B.A., diocesan architect, Newcastle.

Craven, Newcastle (*accepted*)	£1,684 12 6

RAWMARSH.

For additions and alterations to the Ryecroft Branch Stores, for the Masborough Equitable Pioneers' Society, Ltd. Mr. J. Platts, architect, Rotherham, Yorks.

Thornton & Son	£361 0 0
Chadwick & Co.	313 15 0
Hirst	295 12 0
Pugh, Rawmarsh (*accepted*)	278 0 0

SCOTLAND.

For the distribution pipes in connection with the Glenquey water system for the Dunfermline and District Committee of the Fife County Council.

Section I.

M'Lauchlan (*accepted*)	£2.051 0 0

Section II.

Grant & Son (*accepted*)	4,732 0 0

SHIRLEY.

For proposed cottage, &c., at Shirley, Warwickshire. Messrs. Bennett & Stratton, architects, Finchley, London.

J. & W. Thompson	£543 15 0
Bragg & Sons	485 0 0
Morris	438 0 0
Davis	425 0 0
Briley	388 0 0
Gibbs	385 0 0

SOUTHWICK.

For the work of sewering, levelling, paving, metalling, flagging, channelling, making good and lighting certain portions of Southdown Road and road east side of Green. Mr. Geo. W. Warr, surveyor.

Bostel Bros.	£876 0 0
Holman	729 0 0
Peerless, Dennis & Co.	693 0 0
Gillam	681 0 0
King	666 0 0
Woolgar Bros.	665 0 0
Swales	604 0 0
Trueman	585 0 0
McKellar	547 0 0
Parsons & Sons, Hove (*accepted*)	524 0 0

WESTERHOPE.

For the erection of an infants' school, for the Northumberland education committee.

Jameson, Kent Bank Foot (*accepted*)	£1,356 1 0

WALES.

For building abutment, retaining and parapet walls, for a steel bridge at Glyncorrwg, Port Talbot. Mr. W. P. Jones, engineer and surveyor, Glyncorrwg.

Smith	£1,433 0 0
Thompson & Co.	1,076 0 0
Walker	881 0 0
Lloyd	703 0 0
Scott	695 0 0
Barnes, Chaplin & Co.	681 0 0
Collins & Co., Barry (*accepted*)	581 0 0
Engineer's estimate	653 0 0

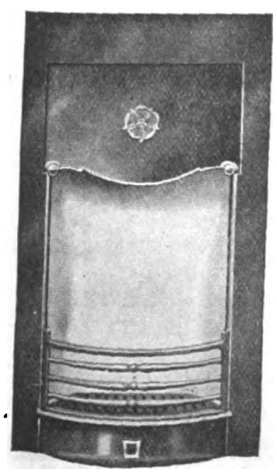
(Patent) "HESTIA" GRATES (Patent)

EFFICIENT :: ECONOMICAL :: INEXPENSIVE

Made in a variety of designs as Registers, Mantel Registers, or Interior Grates.

A CERTAIN CURE FOR SMOKY CHIMNEYS.

BURNS ANTHRACITE, COKE or COAL FUEL.



No. 2 Interior, with blower hidden behind the canopy.

SPECIAL FEATURES

SIMPLICITY.—No parts can get out of order. All parts can be removed and replaced by hand.

BLOWER hidden behind canopy always ready for use. Lowered and raised by slight hand pressure. No disturbance of the fire basket and no movement of the fire-bricks.

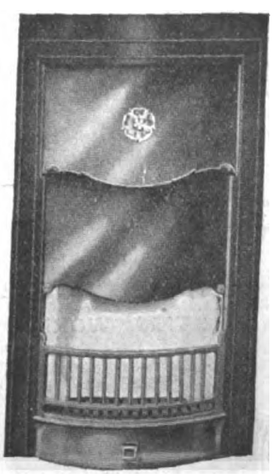
CHIMNEY DAMPER is automatic. Opening and closing with the pull and push of swing canopy, it checks down draught and prevents escape of warm air from the room.

THE "HESTIA" GRATES HOLD THE CERTIFICATE OF THE INCORPORATED INSTITUTE OF HYGIENE.

We Guarantee Satisfaction.

PLEASE WRITE FOR LISTS.

GOODS · SUPPLIED · THROUGH · MERCHANTS.



No. 4 Interior, with blower down for quickening the fire.

Camelon Iron Coy., Ltd., Falkirk.

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WALES—*continued.*

For street improvement works in Whitchurch Road, Gabalfa, in the parish of Llandaff, for the Llandaff and Dinas Powis Rural District Council. Mr. JAMES HOLDEN, A.M.I.C.E., engineer, Cardiff.

Davies	£663 8 6
Williams	632 7 5
Rees	591 11 8

TRADE NOTES.

UNDER the direction of Mr. A. S. Manning, architect, Portland Chambers, Newmarket, the "Boyle" system of natural ventilation, embracing the latest patent "air-pump" ventilators, has been applied to Sir John Thursby's training establishment, Malton.

MESSRS. ARCHIBALD SMITH & STEVENS, lift engineers, Janus Works, Queen's Road, Battersea, have for family reasons converted their business into a limited company under the title of Smith, Major & Stevens, Ltd. No shares have been offered to the public, and the previous owners, Messrs. C. G. Major, E. C. Stevens and P. H. Stevens, together with Mr. P. C. Major, become directors, with Mr. C. G. Major as chairman.

OWING to the great demand for the patent Manchester grate, stove, and ventilators, Messrs. E. H. Shorland & Brother, of Manchester, have been compelled to largely extend their works, and they have accordingly removed to new premises, viz., The Manchester Stove Works, Failsworth, Manchester. The change in address has necessitated alterations in their telegraphic address and telephone number, which now are:—Shorland, Failsworth, and No. 319 Failsworth, Manchester, respectively.

A MEETING for the purpose of forming the District Committee for District No. 4 of the Institution of Municipal Engineers (comprising the counties of Cambridge, Huntingdon, Norfolk, Northants, and Suffolk) will be held at the Royal Hotel, Norwich, on Saturday, November 13, at 2 o'clock.

BUILDING AND BUILDERS.

MESSRS. DOULTON & Co., the sanitary engineers, are carrying out an extension of their works at Hawkhead Road, Paisley, N.B.

THE Durham Urban District Council have passed amended plans submitted for a hippodrome to be erected at the corner of Providence Row.

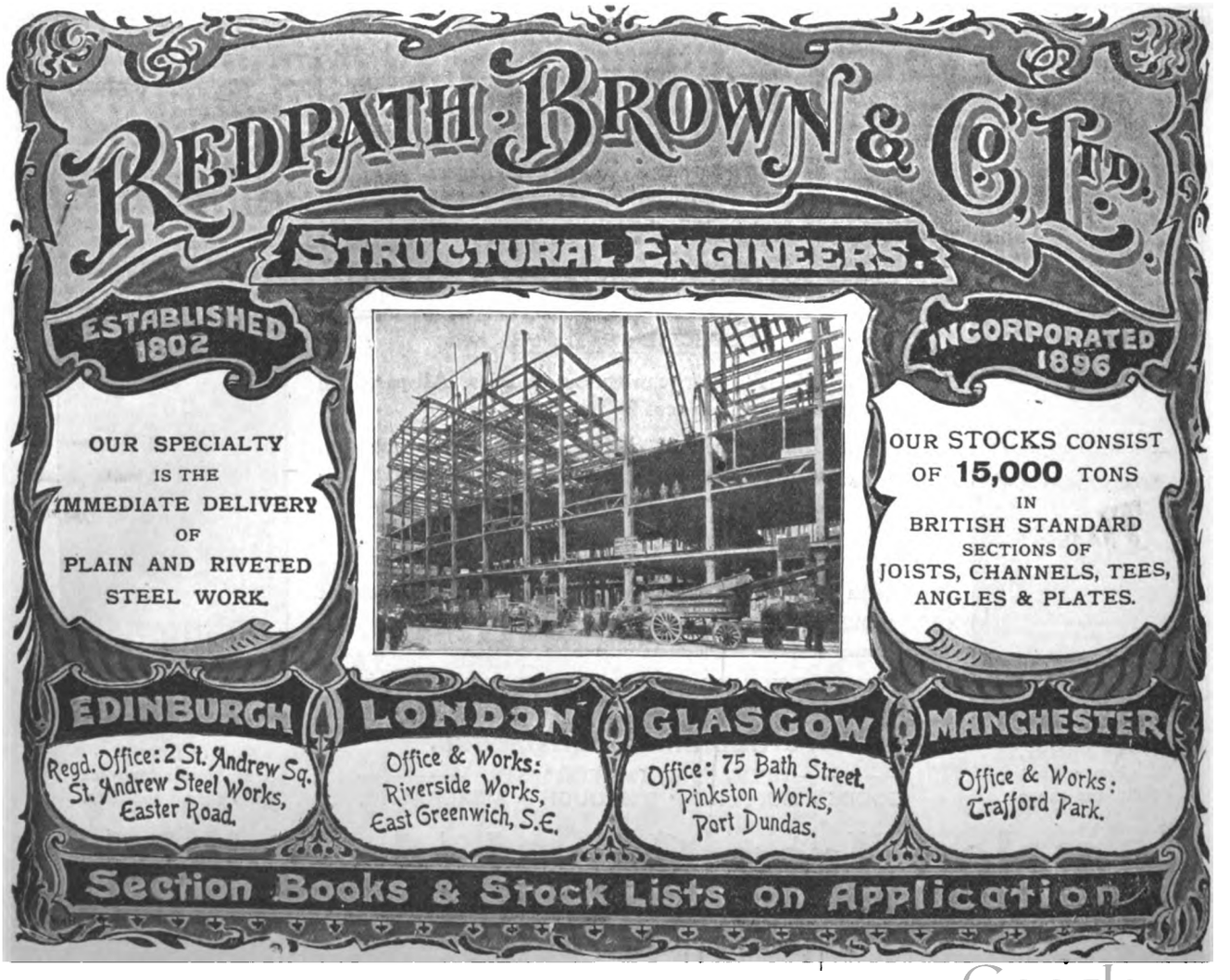
THE West Riding Education Authority has, in consequence of the representations of the Mexborough Sub-Committee, decided to defer for six months the issue of advertisements for tenders with respect to the proposed elementary school in Adwick Road, Mexborough.

THE Glasgow Dean of Guild Court during the past official year dealt with 369 cases amounting to a total value of 902,613*l*. This is a slight increase on the amounts of two previous years, but is about half that averaged ten years ago when building trade was good.

PLANS are being prepared for the erection of new schools in connection with the parish church at Great Harwood to supplant premises in Queen Street which do not comply with the Board of Education requirements. The cost will be probably over 4,000*l*.

LOCAL masons and joiners have served notices on the Swansea Master Builders' Association for an increase of 1*d*. per hour, together with alterations of rules, the same to come into force in six months' time. The men are at present receiving 8½*d*. per hour. A provision in the rules stipulates that any dispute shall be settled by arbitration.

THE sixth Manchester Building and Sanitary Trades Exhibition will be held in the City Exhibition Hall, Manchester, from Tuesday, March 8, to Saturday, March 19, 1910, under the patronage of Manchester, Salford and District Building Trades Employers' Association, the Manchester and District branch of the National Registration of Plumbers, and the principal architects, surveyors and city and borough engineers of the North. A section will be devoted to the display of architectural drawings, plans and photographs. All inquiries to be addressed to Mr. Walter Cawood, Exhibition Offices, 16 John Dalton Street, Manchester.



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ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 20. MR. ERNEST NEWTON.
NO. 21, MR. WALTER CAVE, F.R.I.B.A.

HIGH SCHOOL FOR GIRLS, STOCKPORT.

DESIGN FOR A TOWN HALL AND MUNICIPAL BUILDING.

HOUSE AT KINGSTON HILL.—MAIN STAIRCASE.

COMPETITION DESIGN FOR ADDITIONS TO TOWN HALL, STOKE-UPON-TRENT.

VARIETIES.

THE Zoological Society are erecting new premises in their Gardens in Regent's Park according to the designs prepared by Mr. John Belcher, R.A. The cost will be over 15,000*l.*

HARLINGTON Baptist Church has been remodelled, renovated, and decorated under the superintendence of Messrs. George Baines & Son, 5 Clement's Inn, Strand. The contract has been carried out by Mr. T. W. Crutchfield, of Harlington.

DURING the year ending October 31 the Paisley Dean of Guild Court passed plans amounting to 90,260*l.*, which was an increase of nearly 5,000*l.* over the total for the preceding twelve months.

THE Pontypridd Guardians invite designs and tenders for erection of iron buildings in Court House Street, Pontypridd. A block plan of the site and of the size of the suggested buildings, together with a short description, may be seen at the office of Mr. Wm. Spickett, clerk, Union Offices, Pontypridd, at any time between 10 A.M. and 5 P.M., not later than November 23.

A REPORT on a scheme of water supply for Ecclefechan and district has been prepared by Messrs. D. Balfour & Son, of Newcastle-on-Tyne and Edinburgh, for the Lockerbie District Committee of the Dumfries County Council. The proposed source is from springs situate at Haregills at an altitude of about 500 feet, which yield a supply for the locality of over 60 gallons per head. It is proposed to construct a concrete reservoir near the springs, from which the water will be conveyed in pipes to Ecclefechan and also to all property situate in the large water district. The water will be delivered at a sufficient pressure to give ample head, except at three isolated properties, where tanks will be provided. There will be several miles of pipes to be laid, including the necessary stop, scour, and air valves, and also the providing of pillar wells for smaller property. The whole of the pipes are to be hydraulically tested in the trenches to double the working pressure before being covered up.

AT King's College, London, on the 5th inst., a number of master and operative plumbers attended from various parts of the country for practical and theoretical examination for the purpose of registration under the National Registration of Plumbers. The practical examination consisted of tests in lead bossing, also bending and wiping large and small joints as required for good class domestic sanitary plumbing. In the theoretical examination questions were put to the candidates dealing with domestic sanitation generally, ventilation, and the connection of water services to domestic dwellings and public institutions. Nine candidates passed, and were nominated to the General Council for registration under the National Registration of Plumbers and admission to the Register.

THE BUILDING OF A HOUSE.

AT the last meeting of the Glasgow and West of Scotland Technical College Architectural Craftsmen's Society, Mr. James Flett, President, in the chair, Professor Charles Gourlay, B.Sc., A.R.I.B.A., delivered a lecture entitled, "The Building of a House." Beginning by defining building construction as the sum of all the building crafts controlled as regards design by the master mind of the architect, the Professor proceeded to treat his subject on the basis of this definition. He pointed out how fundamentally necessary it was that the student should study at least one entire building to enable him to appreciate the many varied processes which are involved in the construction of buildings. To emphasise this view he then showed a series of slides giving complete working drawings for a country house in which as many different constructional details had been included as possible, while maintaining the unity of the design as a whole.

In conclusion he urged the importance of all architectural craftsmen pursuing a general course of this nature in building construction.

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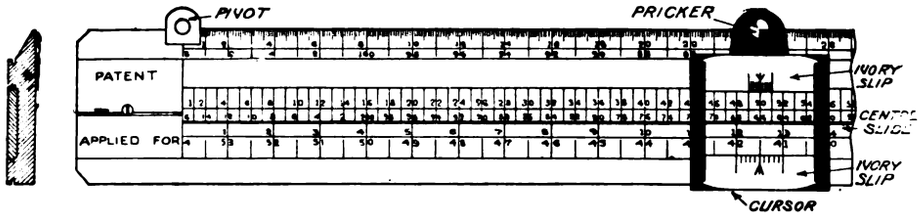
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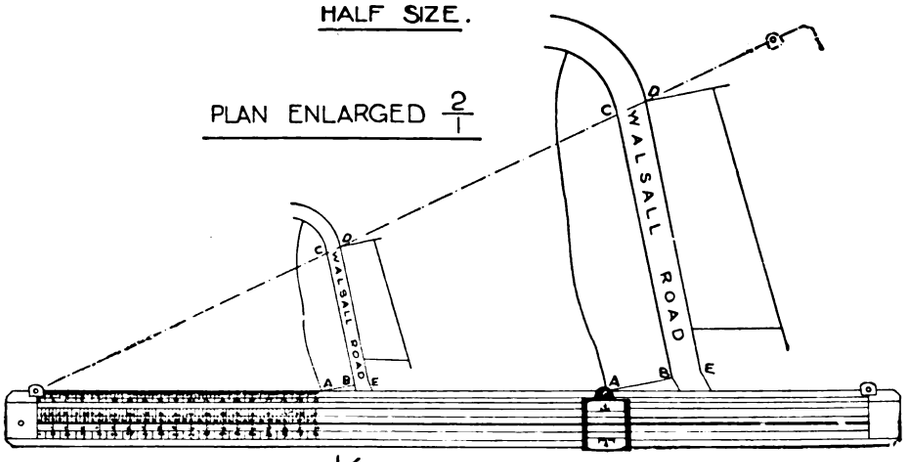
A NEW ENLARGING INSTRUMENT.

THE "Best" enlarging and reducing scale has the advantages of simplicity and accuracy, and though not equal in rapidity to the pantograph, appears to us to be superior in accuracy. It consists of a stock or body, the centre of which is grooved to receive a movable slide, on which are engraved four scales, so that the same instrument can be used for various proportions of enlargement or reduction. At each end of the stock is a pivot plate and the instrument is used, as may be seen from the illustration, by placing a pin through the pivot-hole and revolving around this centre. The distance from the centre of points on the original plan is read on the edge of the stock, then the corresponding enlargement is taken on the central scale and the point marked by a pricker forming part of a sliding cursor. Thus points on the original A, B, C, D determine similar points on the enlargement. Ivory slips are carried by the cursor for subdivision of the parts on the principal scales. It will be seen that the idea of the instrument is based on the theory of similar triangles, and cannot fail to be accurate with careful handling.



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ESTIMATION OF AREAS.

For the calculation of areas of land or other surfaces of an irregular form various instruments have been devised in the form of computing scales or planimeter. A new instrument which has the merit of simplicity is the "Areameter," made and sold by Mr. Albert E. Mallandain, of 51 Cheapside, London. This consists of a clear piece of celluloid, which has two curved and one straight edge. In the centre of the straight edge is a nick which enables the instrument to revolve around a centre pin placed approximately at the middle of the area to be computed. As the instrument revolves it marks on the periphery of the area the bases of triangles of equal area, so that one has only to count the number of divisions in the periphery of the area to obtain the number of equal triangles into which the area is divided. The only objection we have to the instrument is, that as ordinarily supplied the plan must be drawn to rather a small scale, but we presume it would be possible to have larger sizes of the instrument made to order on the same principle.

LONDON MASTER BUILDERS' ASSOCIATION.

A special Council Meeting was held at 31 and 32 Bedford Street, Strand, W.C., on Thursday, 4th inst., the President (Mr. F. G. Rice) in the chair.

The meeting was largely attended, and much interest was displayed in the various subjects submitted for consideration.

The "proofs" of the pamphlet about to be issued were considered, and instructions were given as to their circulation. A question arose as to the radii observed by the London County Council and the London Master Builders' Association; twenty miles from Charing Cross being adopted by the former body as its limit, while the latter body had a radius of twelve miles from the same centre, as set out in the working rule agreements with the different trade societies. Eventually the Council decided to adhere to its own limitations, and to limit its operations to the twelve-mile radius.

A very interesting discussion on the work of the Organisation Committee took place, in which Mr. F. Higgs (Chairman of that Committee), Mr. G. Bird Godson, Mr. Frank May, Mr. W. Lawrence, jun., Mr. John Garrett, Mr. Ernest J. Brown, and Mr. H. W. H. W. Horner took part.

Mr. G. Bird Godson referred to the question of tendering without quantities being supplied, and to the hardship imposed on builders by having to take out their own quantities He suggested that the matter be ventilated by deputations from the London Master Builders' Association to wait upon the Royal Institute of British Architects and other professional bodies concerned.

Mr. Ernest J. Brown gave the views of the National Federation, and said it was a matter which every effort would be made to remedy.

The Council fully sympathised with Mr. Godson's views, and determined to ask the Royal Institute of British Architects and other bodies to receive a deputation.

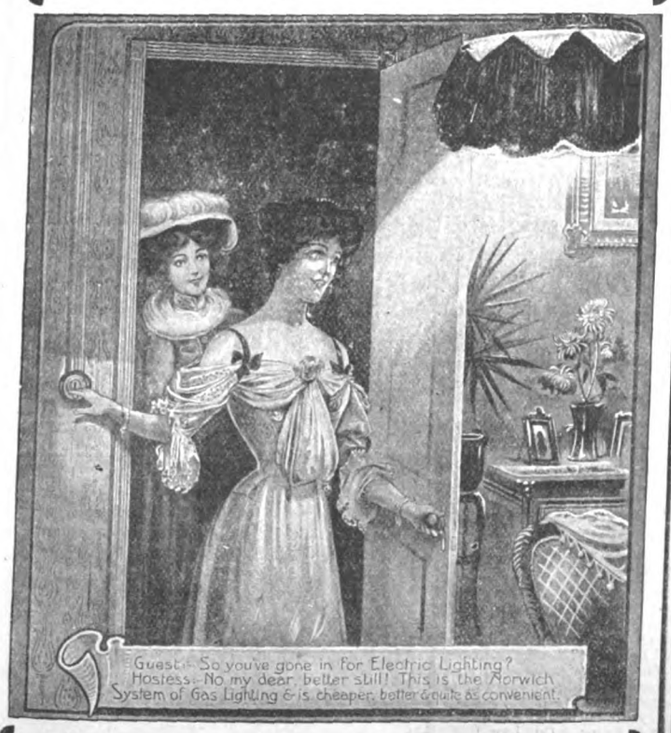
The resolutions passed at the conference with the Quantity Surveyors' Association on October 13 last had been sent to the members of the Council, and it was resolved to send the following to each member of the association. The discussion on it was entered into by Mr. Ernest J. Brown, Mr. Frank May, Mr. W. F. Wallis, and others, and it was

Resolved: That the Conference disapproves of the practice of asking for tenders in competition for works of a substantial value without quantities, prepared by a fully qualified quantity surveyor, being supplied, and is of opinion that such quantities should be supplied in all cases when competitive estimates are invited for works expected to cost 500*l.* and upwards.

A letter advocating the preferential employment of registered plumbers was read, and the views entertained and expressed upon much the same subject by the Institute of Builders were given. The Council was of opinion that the persons engaged should be judged by their practical, and not by paper, qualifications.

Messrs. D. Burkle & Son, of 34 Osnaburgh Road, N.W., was elected a member of the association on the nomination of Messrs. H. C. Cleaver, Ltd., seconded by Mr. G. Bird Godson.

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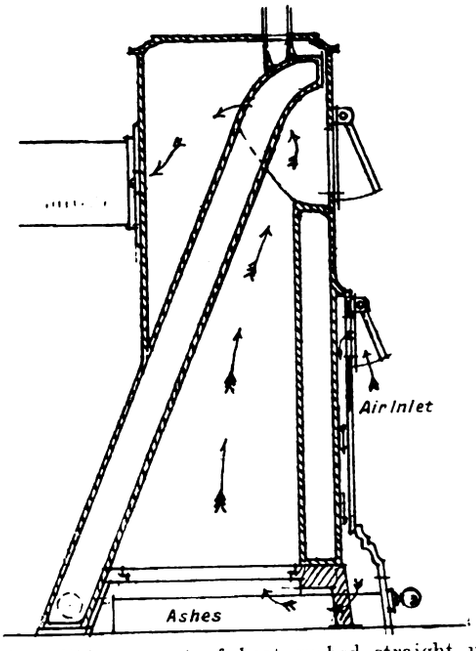
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THE "BELL" BOILER.

THE Bell Range and Foundry Company, Ltd., having come to the conclusion that the kitchen range boiler altogether failed for the purposes of domestic hot-water supply, set about the production of a substitute. There are many types of independent boilers, but the latest, the "Bell" boiler, is a departure from these. It is a new application of a familiar principle, as will be readily seen by the section here given. In the old boilers as in the old fire-grates an



almost incredible amount of heat rushed straight up the chimney and was lost. In their new type all this vertical heat is trapped by the back being made diagonal from the top to the base, so that every part of the fire is directly under the water. The boiler is made of wrought-iron $\frac{3}{8}$-inch plate, with a waterway all round the four sides, and it stands on an iron base. In No. 1 type there is a separate iron casing for the front and top, which thus leaves the sides and back exposed for pipe connection and for cleaning. It has a capacity of 100 gallons per hour at 212°, and the fuel may be anthracite, coke, or coal-cellar sweepings. "Bell" boilers may be utilised for heating and hot-water supply combined. The heating of the radiators is direct from the boiler, and the heating of the domestic supply is by means of a coil in the cylinder, the coil being heated direct from the boiler.

A No. 1 boiler may be used for two radiators each of 30 to 40 feet heating surface, according to distance from the boiler, and in addition will supply hot water at 200° at the rate of 50 to 100 gallons per hour, according to the stoking. This is an ample supply for houses having one or two baths and three or four additional hot-water taps to lavatories, &c.

A No. 2 boiler, which has double the capacity of No. 1, will supply six radiators in addition to domestic supply as above, or with fewer radiators a proportionate extra supply of hot water.

In the second type the boiler is fitted with a tile surround and an iron mantelpiece so as to make it suitable for a kitchen or living room where it is desired to see the fire. The capacity for water heating is 75 gallons per hour, as against 100 gallons in the other, which is an ample supply for a house with one bath and four hot-water taps. The "Bell" boiler, it will thus be obvious, is a noteworthy addition to hot-water engineering appliances, and it is based on elementary scientific principles.

THE East Street Baptist Church and Schools at Southampton are designed in Late Gothic, freely treated. Externally the facings are of red bricks with Bath stone dressings. The complete scheme embraces church with lofty tower, seniors' school, intermediates' school, and juniors' school. The latter section of the school is to be omitted for the present. The cost of the portion to be executed at the present time is about 6,000*l*. The architects, whose designs were selected in a recent competition, are Messrs. George Baines & Son, 5 Clement's Inn, Strand, London.

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WAYGOOD CRANES AND HOISTS.

At the north-east end of London Bridge there is always a large number of people who crowd to the parapets in order to watch the unloading that is unceasingly in progress at the wharfs below. There seems to be an irresistible fascination in the sight of the closely-packed steamers and barges, in the continuous chain of men carrying bales and boxes, and above all in the wonderful cranes that seem to be possessed of more than human dexterity in transferring enormous loads between the vessels' holds and the attendant lighters or warehouses. Probably very few of these idle spectators bother their minds as to the mechanism required to operate such machinery. Such problems only occur to the busy passer-by who lacks the leisure to stop long enough to find out. To such a person the last list issued by Messrs. Waygood & Co., Ltd., dealing with "Cranes and Hoists worked by Hydraulic and Electric Power," cannot fail to be of interest. The firm have for some years past been making a very special study of large cranes for such work, and have erected a very large number of them. One of the illustrations shows an hydraulic wharf crane with patent luffing jib fitted at Gun and Shot Wharf, and another is of a similar crane fixed at Hope Wharf, Rotherhithe. In the first the wrought-iron jibs can be made to luff from 60 feet maximum to 27 feet minimum. Messrs. Waygood are not, of course, committed to the exclusive use of either hydraulic or electric power. The providers of both now offer facilities for its employment. The London Hydraulic Power Company have extended their high-pressure supply on both sides of the Thames, and the electric supply companies usually provide continuous current at low rates.

The list is not confined to riverside machinery, for it also deals with the firm's hydraulic warehouse crane, of which a very large number have been fixed all over the country. In some cases as many as eight are installed in a single warehouse. There are, in addition, illustrations of an electric warehouse crane, an electric gantry crane at work on Tower Bridge Wharf, an hydraulic pedestal crane fixed at Fishmongers' Hall Wharf, a friction hoist, and a hand-power crane. Messrs. Waygood's lifts have received the *imprimatur* of royalty, and it is evident that their cranes and hoists equally maintain their reputation.

HOT-WATER SUPPLY SERVICE INSTALLATIONS.

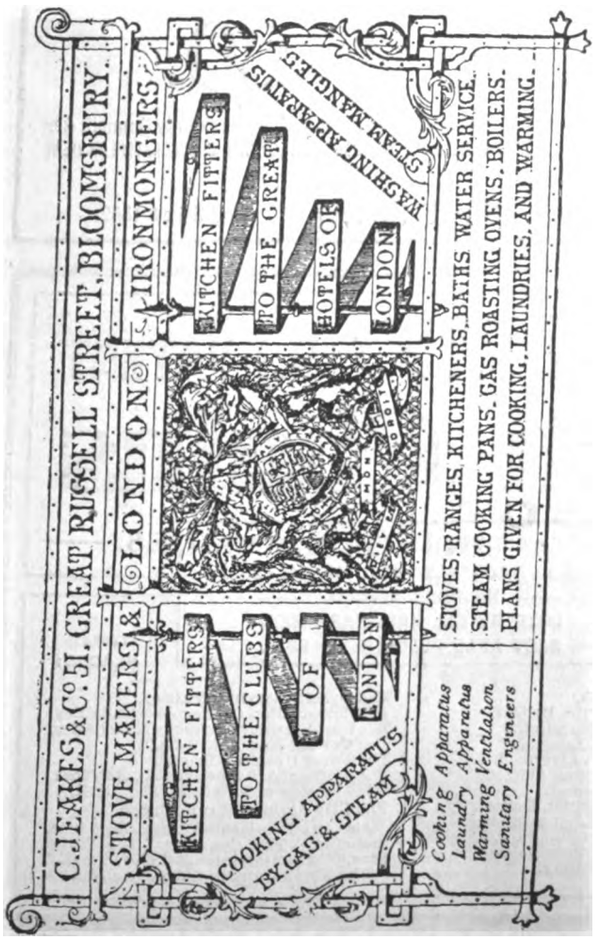
In the heating and domestic engineering trade disputes have been caused within the last few years in some districts by the aggressive action of the plumbers in claiming a monopoly of pipe-fitting and fixing work in all metals (whether lead or not) to the exclusion of any other trade. With the object of preventing such disputes the engineers have all along been willing to submit the whole matter to arbitration for a general, national settlement.

A step in this direction has now been taken in connection with a dispute on the new Masonic Hall, Leicester, where the plumbers, in pursuance of their claims, adopted their usual policy of "sticking the job." Lead work is not in dispute, as it is not touched by the engineers. After protracted delay the plumbers agreed to join in an application to the Board of Trade to appoint an arbitrator to hear and determine the question of dispute between the parties. Alderman T. Smith, J.P., was appointed to act as arbitrator, and heard the case in Leicester on the 5th and 6th inst., the parties represented being Messrs. Ashwell & Nesbit, Ltd., the heating and domestic engineering contractors; the Masters' National Association and the Operatives' National Union connected with this trade on one side, and the plumbers' section of the Leicester and District Building Trades Employers' Association and the United Operative Plumbers' Association (Leicester District) on the other side.

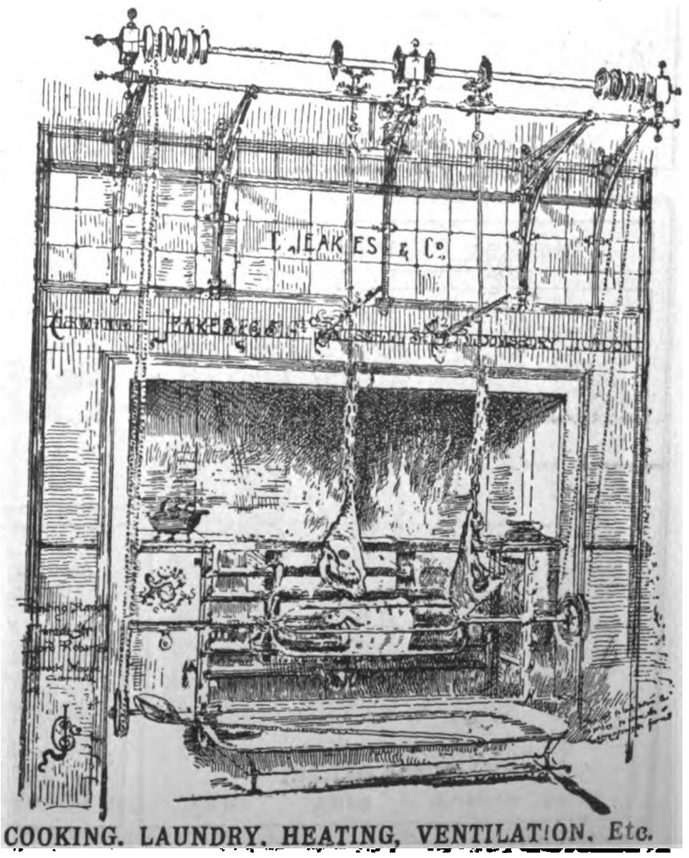
At the termination of the proceedings the arbitrator reserved his award, but it is expected to be given immediately.

A fishing village is proposed to be constructed in Cardigan Bay at a cost of about 40,000*l*. The scheme is connected with the Welsh Industries Company, Ltd.

The Samuel King's secondary school at Alston, Cumberland, was opened recently. The block, of stone from Nattrass Gill, with worked stone from Prudham Quarry, and Haltwhistle bricks, faces the town. There is a large central hall, from which run corridors through the sections for boys and girls. The cost was about 3,700*l*. The architect was Mr. T. Taylor Scott, architect, Carlisle.



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"Self"	William Muirhead, 35 Queen Victoria Street, London.
"Mignon"	Woodhouse & Co., Ltd., Doncaster.

Iron and Steel.

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"B. S. W."	The British Steel and Wire Co., Ltd., wire work, Trafford Park, Manchester.
"Novo"	Jonas & Colver, Ltd., Continental Steel Works and Novo Steel Works, Sheffield.
"Troika"	W. K. & C. Peage, Ltd., Eagle Works, Mowbray Street, Sheffield.

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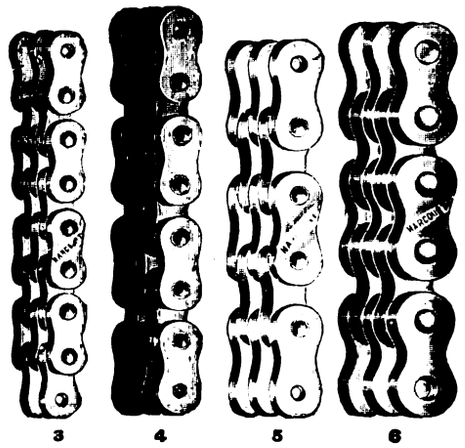
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ORIENTAL SANITARY ENGINEERING.*

BROADLY speaking, engineering in the Orient does not differ from that obtaining in the West when carried out by Europeans. Hence I would prefer this paper to be considered as one on Oriental sanitation, under which heading I will touch upon a few points in sanitary engineering from a municipal engineer's point of view.

Roads.—All the best recognised principles in Great Britain are to-day practised in the East. It is desirable, however, to remember that the amount of "binding" material required is to an extent dependent on the rainfall: more such material being necessary to prevent the road disintegrating in parts of the country having long dry seasons than in those having more frequent rain. The same consideration affects the camber of the road; places subjected to very heavy falls of tropical rain should have roads as flat as possible, otherwise they are cut up into ruts.

Road Watering.—This is of great sanitary importance in hot countries, as besides its protective influence on the road, it prevents the distribution through the wind of decaying refuse. The native overseers, however, unless well supervised, will have the roads watered whilst the sun is still blazing, and by the time people turn out in the evening the roads are dry. The installation of a water supply such as Calcutta is using for watering streets is inadvisable. The water is pumped from the river Hooghly—notoriously dirty—direct into distributing mains, and delivered at high pressure through hydrants and hose on to the roads. The consequence is that, with the water, a very large amount of matter in suspension is distributed, which makes its presence appreciably felt as soon as the roads are dry again. A good deal of this matter must settle on comestibles exposed for sale. The grit, &c., in the water is also the cause of most of the hydrants being in a state of chronic leakiness.

Drainage.—In the majority of rural districts, and in the most thickly populated but poorer parts of many large towns, there are no sanitary conveniences worthy of the name in or

* Abstract from paper read at a Sessional Meeting of the Institute of Sanitary Engineers on November 3 by C. T. Evennette (Fellow).

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at all near blocks of houses. In most houses, however, there is a squatting place in the house, or in the corner of a small attached courtyard, from which sullage water often drains into the public roadside drains—where such exist—outside the houses. Often such roadside drains are earthen, and the result can easily be imagined. A municipal engineer, when required to pave such drains in towns having no pipe-water supply, or an insufficient supply of water to allow of a system of sewers being laid down, must take into consideration several points peculiar to such situations. Since all surface drainage water contains a large amount of matter in suspension, it is desirable that the liquid flow as quickly as is compatible with the safety of the material of which the drains are constructed. During the dry season there will be only sullage and a small amount of domestic water to be dealt with; whilst in the rainy season the quantity of water is great. The difficulty is to have such a section of drain as will give a sufficient velocity in the dry season and still be serviceable during the rains. The saucer-shaped drain is cheap and easy to lay, and, superficially, the easiest to keep clean by manual labour. It is, however, almost the worst shape to put down, as during the hot season the very small amount of water (and that largely sullage) which flows, spreads out with very little flow, and also forms a film on the sides of the wide drain from which gases of decomposition quickly emanate. Any form of drain having angles or a flat bottom is equally objectionable, as the former are very difficult to keep clean, and the latter are not self-cleansing. In fact, this last is worse than the saucer shape.

The best form is what is sometimes called the peg-top section. This has an invert of about 135 deg., with a small radius, and straight sides above it tangential to the ends of the curve. According to the amount of water required to be dealt with suitable dimensions for all seasons can easily be arranged.

Covered-in drains, as distinct from a sewerage system, are an abomination in the East, as they are almost impossible to keep clean. A compromise can be arranged, however when necessary, by having removable covers to the pattern of drain last described (*i.e.* the peg-top). These covers should be made in short lengths, so that they can be lifted to allow of thorough cleaning of the drain.

The sullage usually finds its way to the end of the line of masonry drains, only to flow into earthen drains at the end. The reason is often an insufficiency of public funds to continue the line of masonry drains right outside the township, and there to dispose of it scientifically. When drains empty themselves thus, there is generally a black quagmire for some distance along the earthen line of drainage—and that is all—until possibly some deadly disease breaks out, and then matters are carried further if funds can be made available.

These evils can be mitigated with very little cost until further funds are at his command by the construction of a small masonry tank 4 or 5 feet deep at the end of the line of masonry drains and at a slightly lower level. This tank should be divided into two compartments by a partition wall—the compartment nearer the end of the drain should be about a third of the size of the other. Holes should be left at the bottom of the partition wall, and an iron grating fitted just below the outfall of the drain into the first compartment. A grillage should be fitted across the larger compartment about a foot from the floor, above which grillage cinders, broken brick, or stone should be put in, gradually diminishing in size up to the top. By upward filtration of the liquid discharged from the drainage line in this manner a great nuisance and danger to health is thus minimised, as the effluent can then be safely left to meander along the earthen drainage line beyond such a filter.

If the amount of sullage from the masonry drains is very small, it would be sufficient perhaps to excavate a length of about 20 feet or so, to a depth of 2 feet of the earthen drain, commencing at the end of the line of masonry drains, and to fill this excavation with suitable available metal.

Flushing of Surface Drains where no Pipe-water Supply Exists.—Generally, wells are found on the roadsides, and to take fullest advantage of the water so situated the sides of the walls of the drains should be grooved every 150 feet or so for the purpose of boards being fitted into the grooves across the drain section. One section is then filled with water from the well and, as soon as the board is withdrawn, if a sweeper starts from the head of the section, and uses his broom properly, the velocity of the water going forward to the next section is much increased, and the drain is efficiently cleansed at the same time.

(*To be continued.*)

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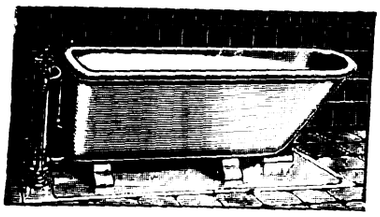
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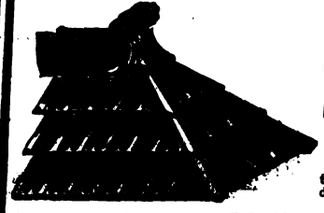
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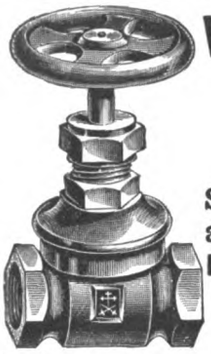
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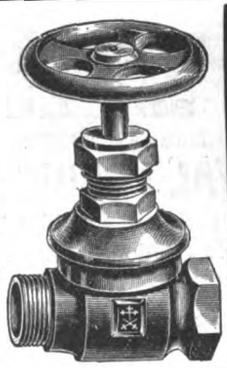
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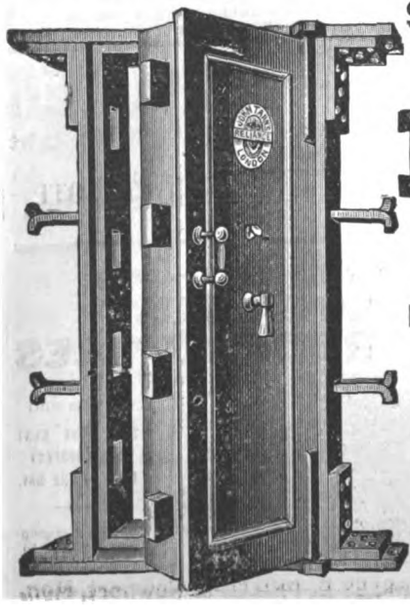
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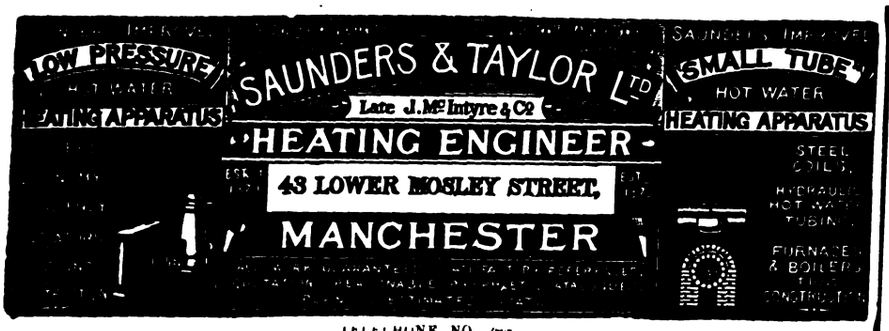
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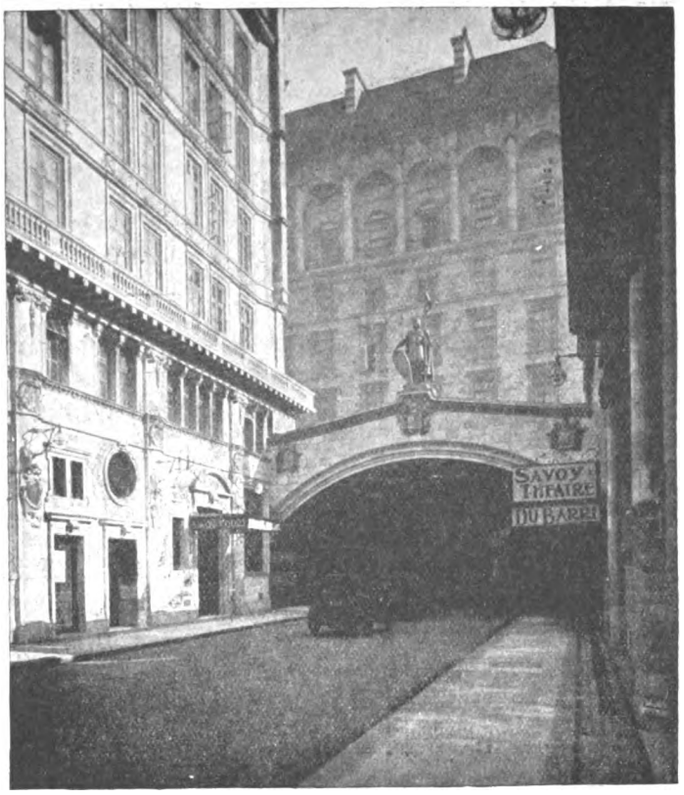
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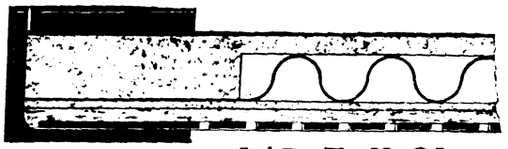
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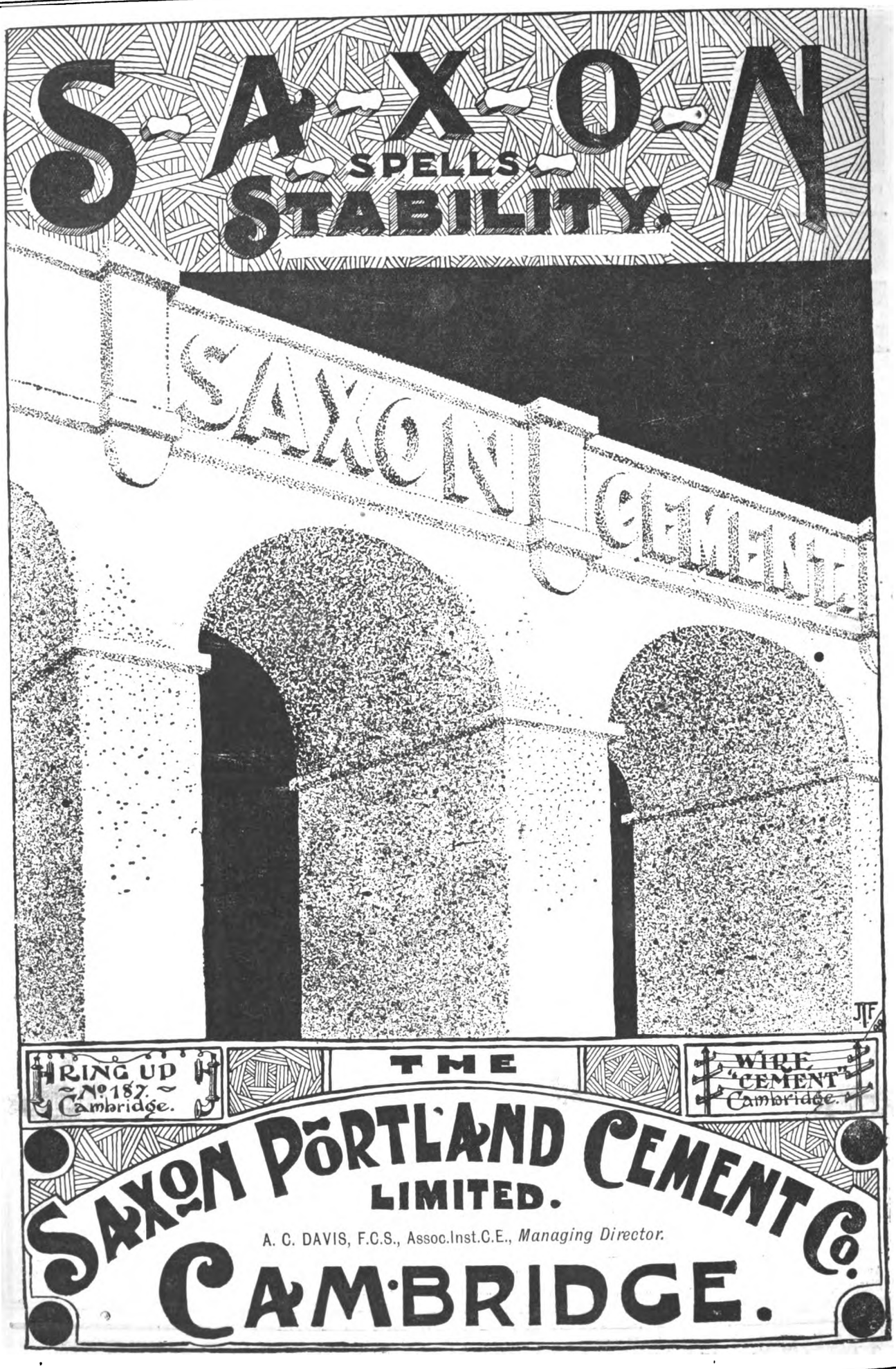
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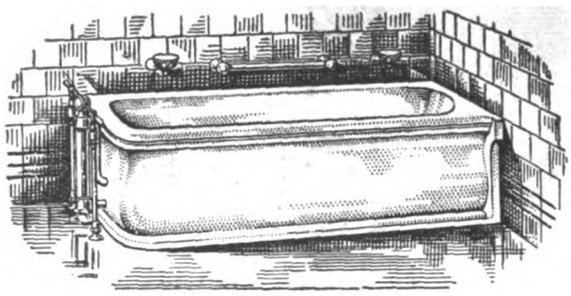
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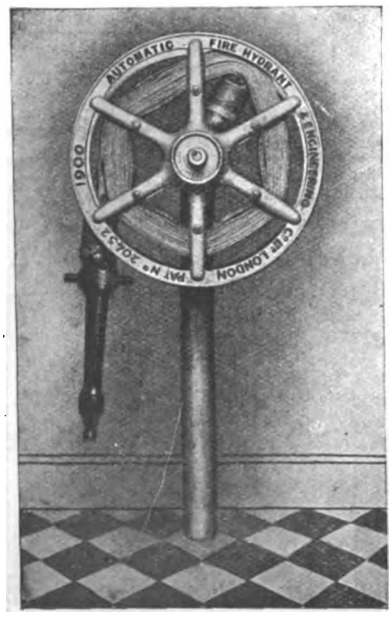
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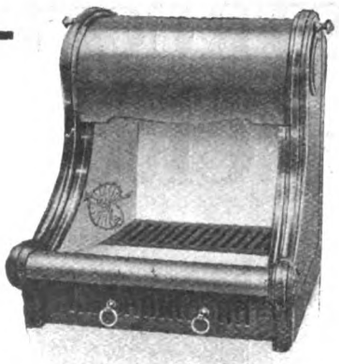
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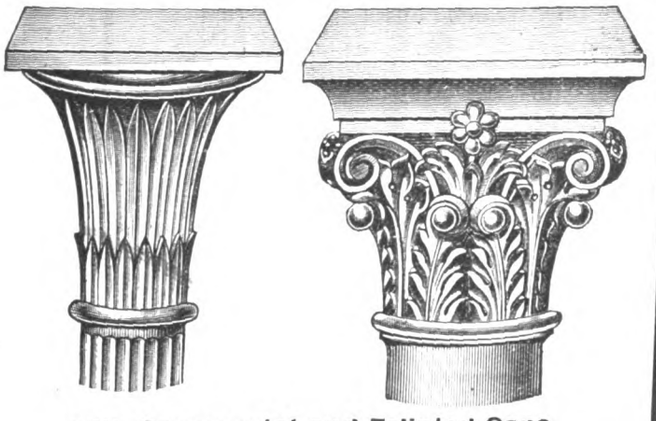
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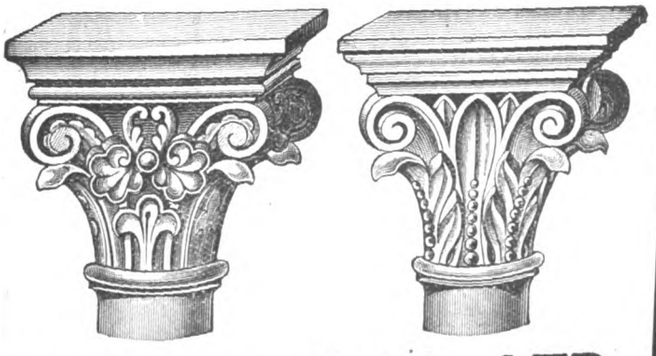
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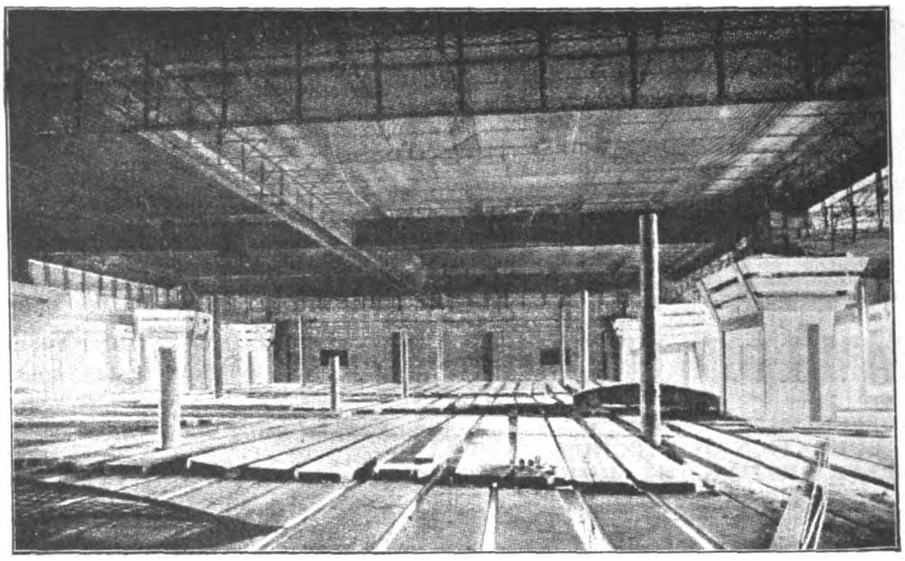
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In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

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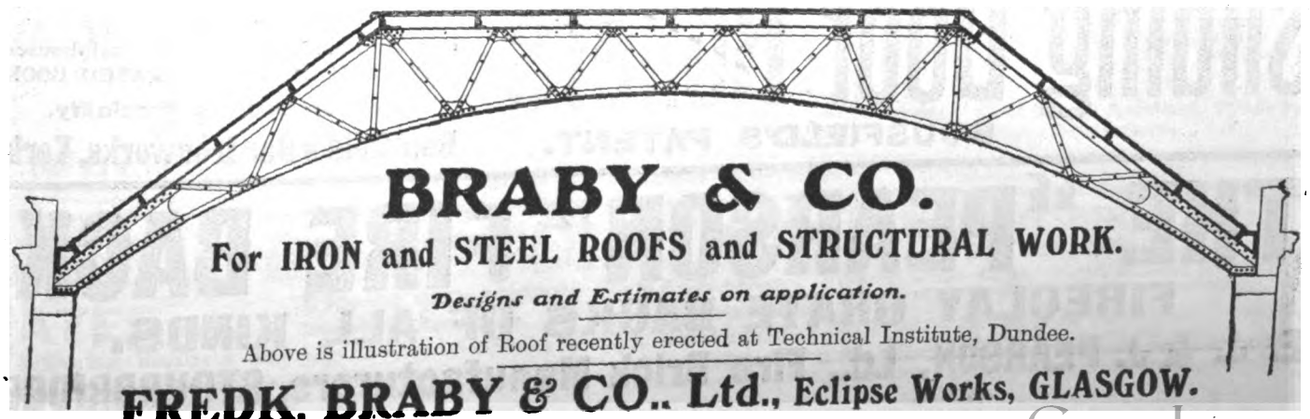
LEEDS.—Dec. 18.—The education committee invite architects practising in Leeds to submit designs for proposed training college for teachers, Kirkstall Grange, Far Headingley. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist the committee. Deposit 2*l.* 2*s.* Mr. James Graham, Secretary for Education, Education Department, Leeds.

MINEHEAD.—Dec. 11.—For a shelter with cloak-room and lavatories, on the beach at Minehead, Somerset, to cost not more than 3,000*l.* Deposit 5*s.* Premium 20*l.* The premiated plans to become the property of the Council; or, in event of the architect carrying out the work, the premium will merge in the commission. Mr. L. C. Webber-Incledon, clerk, 16 Park Street, Minehead, Somerset.

OLDHAM.—Feb. 1. The Town Council invite competitive designs from architects practising or residing within the borough for an extension of the town hall. Premiums of 50*l.*, 30*l.*, and 20*l.* are offered, together with 5*l.* for every competitor who carries out the instructions. Apply to Mr. E. C. Foote, borough surveyor, Oldham, Lancs.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

WORKINGTON.—Nov. 30.—The Cumberland education committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the borough of Workington, Cumberland, for about 300 pupils of both sexes. Deposit 1*l.* 1*s.* Mr. C. Courtenay Hodgson, secretary, The Courts, Carlisle.



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CONTRACT OPEN.

ALDEBURGH.—Nov. 24.—For the removal of the upper portion of the existing brick water tower at Aldeburgh, including the roof, cast-iron tank holding 11,000 gallons, girders and internal fittings, and the construction of a new steel tank to contain 35,000 gallons upon steel columns and joists fixed inside the tower, and rebuilding the walls of the tower to a greater height, together with the connections to the mains, staircases, and other works, for the Corporation. Deposit 2*l.* 2*s.* Messrs. J. Mansergh & Sons, engineers, 5 Victoria Street, Westminster.

BARNET.—Nov. 22.—For the alteration of external doors, &c., at the isolation hospital. Messrs. White, Son & Pill, 13 and 15 High Street, Barnet.

BIRMINGHAM.—Nov. 19.—For erection of a Council school in Charles Arthur Street, Nechells. Deposit 2*l.* Apply to Finance Office at the Education Department, Edmund Street, Birmingham.

BURY ST. EDMUNDS.—Nov. 20.—For the provision of a cookery room, assembly hall, and alterations to the County school and P.T. Centre. Mr. A. Ainsworth Hunt, building inspector, Shire Hall, Bury St. Edmunds.

CLAY CROSS.—Nov. 30.—For additions to the Primitive Methodist Sunday schools, Clay Cross, Chesterfield. Mr. H. Harper, architect, 54 Long Row, Nottingham.

COVENTRY.—Nov. 24.—For erection of a public elementary school in Broad Street. Deposit 1*l.* 1*s.* Messrs. G. & I. Steane, 22 Little Park Street, Coventry.

CROYDON.—Dec. 15.—For additions to the Croydon Isolation Hospital, near Mitcham Junction, Surrey, comprising a twelve-cubicle ward, pavilion, additions to administrative block, two cottages, and other works. Deposit 5*l.* Send names by Nov. 29 to Mr. Robert Masters Chart, F.S.I., surveyor to the Council, Croydon.

EDINBURGH.—Dec. 1.—The Commissioners of H.M. Works and Public Buildings are prepared to receive tenders for the structural work, Royal Scottish Academy (new galleries). Deposit 1*l.* 1*s.* The Principal Architect, H.M. Office of Works, Parliament Square, Edinburgh.

ERDINGTON, NEAR BIRMINGHAM.—Nov. 30.—For the erection of the following buildings, for the Erdington Urban District Council, viz.:—Public lavatories, Orphanage Road and Woodend Road; tramways waiting-rooms and lavatories at Chester Road; open-air swimming-baths, boathouse, landing stage, &c., small bridge spanning stream, and shelters at the new reservoir park. Deposit 5*l.* Mr. Herbert H. Humphries, engineer and surveyor, the Council House, Erdington.

EXMOUTH.—Nov. 22.—For the erection of a general post office, together with a block of three shops and dwelling houses. Deposit 2*l.* 2*s.* Send names to Mr. Ernest E. Ellis, architect, Exmouth.

FALMOUTH.—Dec. 3.—For erection and completion of a dwelling house at Trerose, Mawnan. Plans and specifications may be seen at 6 Treruffe, Redruth.

HALIFAX.—Nov. 27.—For the several works required in connection with erection of sanitary block at the Union workhouse. Messrs. Clement Williams & Sons, architects, Post Office Buildings, Commercial Street, Halifax.

HARROGATE.—Nov. 27.—For the several works required in the erection of an infants' school at New Park, Bilton. Mr. F. Bagshaw, borough engineer, Municipal Offices, Harrogate.

HARROGATE.—Nov. 27.—For the several works required in the erection of extension and alterations to the Secondary schools. The Borough Surveyor, Municipal Offices, Harrogate.

HEYBRIDGE.—Dec. 3.—For taking down and rebuilding Wave Bridge over the Chelmer and Blackwater navigation, at Heybridge, near Maldon, Essex. Mr. Percy J. Sheldon, M.I.C.E., chief surveyor, Tindal Square, Chelmsford.

IRELAND.—Nov. 25.—For proposed additions to Maghery Hotel, Moy, County Tyrone. Mr. Charles Macalister, architect, Whitehall Buildings, Belfast.

IRELAND.—Dec. 1.—For the erection of sixteen houses at Paradise Row, for the Kingstown Urban Council. Deposit 1*l.* (2) For additions to the caretakers' apartments, Royal Victoria Baths; (3) for two shelters at the new park. The Surveyor's Office, Town Hall.

IRELAND.—Dec. 3.—For building and fencing 28 single labourers' cottages, for the Letterkenny Rural District Council. Mr. R. S. Watters, clerk, Board Room, Letterkenny.



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LEAMINGTON.—Nov. 29.—For the execution of the following work for the Town Council, viz.:—(1) Excavation, concrete and brickwork required for the erection of a greenhouse, 100 feet by 12 feet; and (2) joiners', glaziers' and painters' work needed for the completion of same. The Borough Engineer, Town Hall.

LEYTON.—Nov. 30.—For the cleansing, painting, and repairs at two schools, and for other works, to be executed during the Christmas vacation. Deposit 1*l.* Apply by November 23 to Mr. William Jacques, A.R.I.B.A., 2 Fen Court, Fenchurch Street, E.C.

LONDON.—Nov. 23.—For the extension of the Royal Courts of Justice. Deposit 1*l.* 1*s.* Sir Henry Tanner, I.S.O., F.R.I.B.A., H.M. Office of Works, &c., Storey's Gate, S.W.

LONDON.—Nov. 23.—For erection of an iron fire-escape staircase at the workhouse in Woodfield Road, Harrow Road, W., for the Paddington Board of Guardians. Deposit 1*l.* Mr. E. Howley Sim, architect, Mowbray House, Norfolk Street, Strand, W.C.

LONDON.—Nov. 24.—For the demolition of cottages Nos. 35 to 50 (inclusive), Crozier Terrace, High Street, Homerton, N.E., and the erection of boundary walls, for the Guardians of Hackney Union. Mr. Frank R. Coles, clerk, Sidney Road, Homerton, N.E.

LONDON.—Nov. 29.—For erection of an additional ward block, an isolation block, and extensions to the administration block at the isolation hospital, World's End, Winchmore Hill, N., for the Enfield and Edmonton Joint Hospital Board. Deposit 2*l.* 2*s.* Mr. Richard Collins, Public Offices, Enfield.

MANCHESTER.—Nov. 22.—For alterations and additions to messrooms, sheds, &c., at the Pond Street Highways Yard. Deposit 1*l.* 1*s.* The City Architect, Town Hall, Manchester.

MIRFIELD.—Nov. 24.—For the various works required in erection of Wesleyan schools, Knowle, Mirfield, Yorks. Mr. D. K. Lobley, architect and surveyor, 58 Alexandra Crescent, Dewsbury.

PLYMOUTH.—Nov. 23.—For the supply, delivery, and fixing of No. 4 ornamental shelters in the pleasure grounds. Tenders to be accompanied by designs, detail drawings, and specification. Mr. James Paton, borough engineer and surveyor, Municipal Offices, Plymouth.

PRESTWICH.—Nov. 26.—For erection of an elementary school at Prestwich, near Manchester, to accommodate 548 scholars, with special rooms for manual instruction and cookery and laundry work. Deposit 2*l.* Mr. Henry Littler, county architect, 16 Ribblesdale Place, Preston.

RAINHILL.—Nov. 25.—For erection of six cottages at the County Asylum, Rainhill, Lancashire. Deposit 2*l.* 2*s.* The engineer's office, Rainhill.

SALFORD.—Dec. 6.—For a new annexe extension, and for sundry alterations to the Salford town hall and offices in Bexley Square. Deposit 1*l.* 1*s.* Mr. James B. Broadbent, A.R.I.B.A., 15 Cooper Street, Manchester.
John Houston, architect, St. Margaret Street, Dunfermline.

SCOTLAND.—Nov. 24.—For the various works in connection with the erection of post office and dwelling houses in Union Street, Cowdenbeath. Mr. D. E. Walker, Cowdenbeath.

SCOTLAND.—Nov. 26.—For mason, carpenter, plumber, slater, plasterer, and painter works of a villa to be erected near Grantown. The Strathspey Estate Office.

SCOTLAND.—Nov. 25.—For mason, joiner, plumber, plasterer, slater and tile works of proposed offices, Victoria Street, Dunfermline, for the Fife Miners' Association. Mr.

SCOTLAND.—Nov. 30.—For the erection of a motor garage, with upper storey for chauffeurs, and also of new cellar, at the Station Hotel, Aviemore, Inverness-shire. Messrs. Baillie & Gifford, secretaries, 12 Hill Street, Edinburgh.

SEVENOAKS.—Nov. 24.—For constructing bath rooms and extra water closets at the union workhouse, Ide Hill, Sundridge. Mr. E. Pawley, architect, 86 High Street, Sevenoaks.

STANLEY.—Nov. 22.—For erection of Council offices in Front Street, Stanley, Durham. Deposit 2*l.* 2*s.* Mr. John W. Wilson, architect, 3 Coleshill Street, Sutton Coldfield, Warwick.

STOKE-UPON-TRENT.—Dec. 15.—For the erection of the Town Hall extension. Deposit 5*l.* Apply by Nov. 25 to Mr. J. B. Ashwell, town clerk, Stoke-upon-Trent.

WALES.—Nov. 22.—For erection of sixteen or more semi-detached houses at Bedlinog, for the Bedlinog Hall Workmen's Building Club. Mr. Treharne Jones, Nelson.

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WALES.—Nov. 22.—For re-roofing and making alterations to Capel Bangor Church, near Aberystwyth. Mr. G. T. Bassett, A.R.I.B.A., Aberystwyth.

WALES.—Nov. 22.—For the construction of a large swimming-bath, boiler-house and other buildings, for the Powell's Tillery Workmen's Institute, Abertillery. Mr. W. Beddoe Rees, architect, 3 Dumfries Place, Cardiff.

WALES.—Nov. 22.—For erection of thirty-four houses at Pontymister, for the Risca Urban District Council, Mon. Deposit 2*l.* 2*s.* Mr. A. J. Dardis, Council offices, Risca, Mon., engineer to the Council.

WALES.—Nov. 24.—For erection of twenty-eight houses at Tynycae, Penygraig, Rhondda Valley, for Messrs. The Tynycae Building Club. Messrs. W. M. Lewis & T. Naunton Morgan, architects and surveyors, Tonypandy and Pontypridd.

WALES.—Nov. 25.—For taking down, altering, and rebuilding the farm-house at Llanerch, Pendoylan. Also for providing a water supply for the house, for Lady Price-Fothergill, Hensol Castle. Mr. Gomer S. Morgan, surveyor, Pontyclun.

WALES.—Nov. 26.—For extension of Calfaria Baptist Chapel, Blaen-Rhondda. Mr. W. D. Morgan, M.S.A., architect, 194 Ystrad Road, Pentre.

WALES.—Nov. 29.—For erection of fourteen cottages, &c., at Capel Llanilltern, near Creigiau, Llantrissant, Glamorganshire, for the Corporation of Cardiff. Mr. William Harpur, M.I.C.E., city engineer, Cardiff.

WALES.—Dec. 8.—For erection of a workmen's library and institute at Abertridwr. Deposit 3*l.* 3*s.* Mr. Illtyd Thomas, F.S.I., 17 Quay Street, Cardiff.

WANTAGE.—For additions to the Church of England school. Send names to Mr. J. Wightman Douglas, architect, St. Nicholas Buildings, Newcastle-on-Tyne.

WINDSOR.—Nov. 22.—For alterations at the Corn Exchange, Guildhall, Windsor. Mr. E. A. Stickland, borough surveyor, 16 Alma Road, Windsor.

WORKINGTON.—Nov. 20.—For the execution of the several works required in erection of an extension of the meter house at the Stainburn reservoir. Mr. H. B. Williams, borough engineer and surveyor, Town Hall, Workington.

WREXHAM.—Nov. 23.—For the following works at Alexandra schools, or any of them, for the Corporation. (1) Building of palisade wall along Holt Road; (2) supplying wrought-iron railings for palisade; (3) supplying and fixing unclimbable iron fencing. Send names to Mr. Lawson Taylor, clerk to the education committee, Guildhall, Wrexham.

YARDLEY.—Nov. 29.—For works of drainage, excavation, levelling, construction of paths, pool lavatories, and boundary walls, &c., at the Sparkhill recreation ground. Deposit 3*l.* 3*s.* Mr. A. W. Smith, engineer and surveyor, Council House, Sparkill, near Birmingham.

MR. A. ROBERTSON, architect, Inverkeithing, N.B., has been instructed by the local School Board to prepare plans for a school to accommodate 900 children.

THE Stoke-on-Trent Board of Guardians have instructed their architect to prepare plans for new union offices, to cost about 5,000*l.*

A TOWN'S meeting, convened by the Mayor upon a requisition of ratepayers, was held at Burslem last week, to protest against the proposal of the Town Council to erect new municipal buildings, at an estimated cost of 30,000*l.*, towards which it is said there is a sum of 16,000*l.* in hand. By a very large majority a resolution was carried protesting against the proposed expenditure, and asking the Town Council to take the necessary steps to prevent the scheme being proceeded with, and to take a poll. Tenders for the work have already been advertised for.

THE Glasgow Alhambra, Ltd., are about to erect a new variety theatre in that town. A central site at the junction of Waterloo Street and Wellington Street—at present occupied by the Waterloo room—has been secured, and the intention is to demolish the existing structure and erect a building which will provide sitting accommodation for 2,500 persons and standing room for other 300. The building will be fitted up in the most up-to-date style, and the cost is not expected to exceed 27,500*l.*

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Mason	14,250 3 5
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OSMAN, Southampton (*accepted*)	13,938 0 0

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For erecting a dwelling-house, shop, and business premises. Mr. W. H. BUTTRICK, architect, Scunthorpe.

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Buttrick	758 0 0
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LEOMANSLEY.

For the erection of Christ Church schools. Mr. F. T. BECK, architect, Wolverhampton.

CHATTLE, Lichfield (*accepted*)	£2,168 8 0

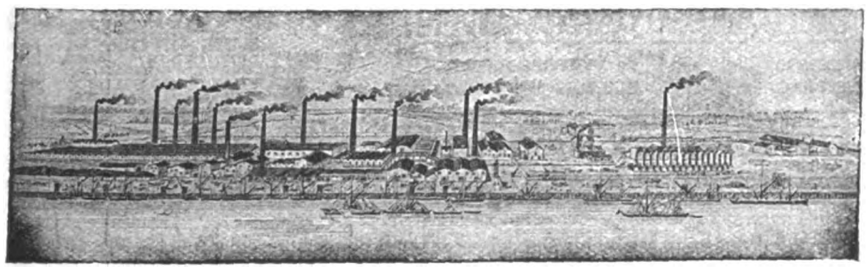
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LONDON—*continued.*

For the building and architectural works required for the completion of the second portion of the Greenwich generating-station, for the L.C.C.

J. & C. Bowyer	£7,992 0 0
Kirk & Randall	7,923 0 0
Munday & Sons	7,683 0 0
Roberts & Co.	7,577 0 0
Leslie & Co.	7,539 0 0
Wall	7,531 0 0
Holloway	7,127 0 0
Holland & Hannen, Bloomsbury, W.C. (*recommended*)	6,827 0 0
Architect's estimate	7,100 0 0

For electric lighting of Buxton Street school, Whitechapel, for the London County Council.

Whitehead Bros.	£429 0 0
Newbald & Co.	325 0 0
British Westinghouse Electric and Manufacturing Co.	311 9 4
Tilley Bros.	303 0 0
Weston & Sons	236 17 0
Johnson & Phillips, Charlton (*accepted*)	230 0 0

For providing and fixing a new boiler at Cottenham Road school, Islington, for the London County Council.

Wontner Smith, Gray & Co.	£227 0 0
Simmons	223 0 0
Gray	220 0 0
Boyd & Sons	219 0 0
Grundy	207 0 0
J. & F. May	206 10 0
G. & E. Bradley	203 0 0
Palowkar & Sons, Queen Street (*accepted*)	193 0 0

For the construction of a storm-water outlet from the Falconbrook pumping station to Battersea-creek, for the L.C.C.

Mowlem & Co.	£19,741 0 0
Pearson & Son	15,262 8 10
Cochrane & Sons	15,255 0 0
Price & Reeves, Waterloo Place, S.W. (*recommended*)	13,971 2 11
Chief Engineer's estimate	16,000 0 0

LONDON—*continued.*

For the reconstruction of Deptford Creek Bridge, for the L.C.C.

Somervail & Co.	£55,344 3 9
Mowlem & Co.	49,666 0 0
Shellabear & Co.	45,025 16 8
Handyside & Co.	40,114 16 8
Westwood & Co.	38,274 11 10
Muirhead & Co.	37,682 15 8
Cochrane & Sons	37,138 9 10
Findlay & Co.	37,071 18 0
Smith & Co.	35,674 15 1
Arrol & Co.	34,509 0 0
Cleveland Bridge and Engineering Co.	32,806 14 2
Thorne & Sons	31,302 11 11
Mitchell Bros.	30,428 11 4
Dick, Kerr & Co., Cannon Street, E.C. (*recommended*)	29,705 11 9
Rowlingsons & Co.	29,610 8 1
Brebner & Co.	29,471 13 3
Braithwaite & Kirk, West Bromwich (*erroneous*)	27,497 0 0
Chief Engineer's estimate	29,997 0 7

For providing and fixing a new boiler at Brackenbury Road school, Hammersmith, for the London County Council.

Korting Bros.	£229 5 6
Brock	196 0 0
Hayward Bros. & Eckstein	189 0 0
Davis	184 0 0
R. H. & J. Pearson	169 0 0
Wenham & Waters	166 0 0
Norden	162 10 0
Tilley Bros., Kingsland Road (*accepted*)	162 9 0

MAIDSTONE.

For alterations at the town hall.

Pearce & Sons	£266 0 0
Barden & Head	261 0 0
Burrows	253 0 0
Cox Bros.	248 0 0
Elmore & Son	230 0 0
Corben & Co.	228 0 0

BOX GROUND TRADE MARK
THE BATH STONE FIRMS LTD
MONK'S PARK TRADE MARK
BATH & PORTLAND QUARRY OWNERS
QUARRIES
MONK'S PARK, CORSHAM DOWN, CORNGRIT, FARLEIGH DOWN, BRADFORD,
LONDON DEPÔTS
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L. & S.W.R. Nine Elms.
132, Grosvenor Road, Pimlico.
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Summer dried seasoned Bath Stone for Winter use.
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LIVERPOOL— IMPERIAL BUILDINGS, EXCHANGE ST. EAST.
MANCHESTER— TRAFFORD PARK.

CABOT'S SHEATHING AND DEADENING QUILT.
ARTHUR L. GIBSON & COMPANY,
KINNEAR PATENT
STEEL ROLLING SHUTTERS
ALL BRITISH MADE.
Radnor Works, Strawberry Vale, Twickenham.
BURT PATENT SKYLIGHT AND VENTILATOR.

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MINEHEAD (SOMERSET).

For the execution of extensions and alterations to their waterworks, for the Minehead Urban District Council. Messrs. A. P. I. Cotterell & Carr, engineers, 26 Victoria Street, Westminster, and 28 Baldwin Street, Bristol.

Shellabear & Sons	£4,248 0 0
Higgins	4,230 0 0
Deakin	3,879 17 11
Lester	3,686 0 0
Wright & Co.	3,631 13 0
Mereweather & Sons	3,449 0 0
Carkeek	3,322 0 0
Bowen & Sons	3,319 0 0
Crockerell	3,241 13 9
Schofield	3,226 0 0
Chamberlain	3,170 2 0
Ireland	3,118 0 0
Aird & Son	3,057 10 11
Smith & Co.	3,015 3 4
Ewart	2,936 0 0
Cowlin & Sons	2,900 0 0
Hine & Sons	2,892 0 0
Hawking & Best	2,870 0 0
Steer & Pearce	2,865 0 0
Wright & Son	2,852 2 11
Webber	2,847 17 3
Pollard & Co.	2,814 0 0
Cooper & Co.	2,749 16 0
Staveley Coal and Iron Co.	2,739 12 9
Small, Taunton (*accepted*)	2,690 0 0
Brebner & Co.	2,602 8 0

READING.

For making-up Northumberland Avenue. Mr. John Bowen, A.M.I.C.E., borough engineer and surveyor.

Free & Sons	£1,460 13 2
Talbot	1,387 0 0
Fitt	1,323 0 0
Gibbons, Maidenhead (*accepted*)	1,257 0 0

ORSETT.

For alterations and additions to Orsett Workhouse. Mr. M. Shiner, A.R.I.B.A., 10 John Street, Adelphi, W.C., and Grays, Essex.

Hibberd & Sons	£6,318 0 0
Wall & Co.	5,686 0 0
Bruty	5,621 0 0
Potter	5,514 0 0
Sheffield	5,397 0 0
Myal & Upson	5,380 0 0
Brown	5,339 0 0
Hammond	5,198 0 0
Archer	5,085 0 0
Carter	4,913 0 0
Brown Bros	4,776 0 0

PORTSMOUTH.

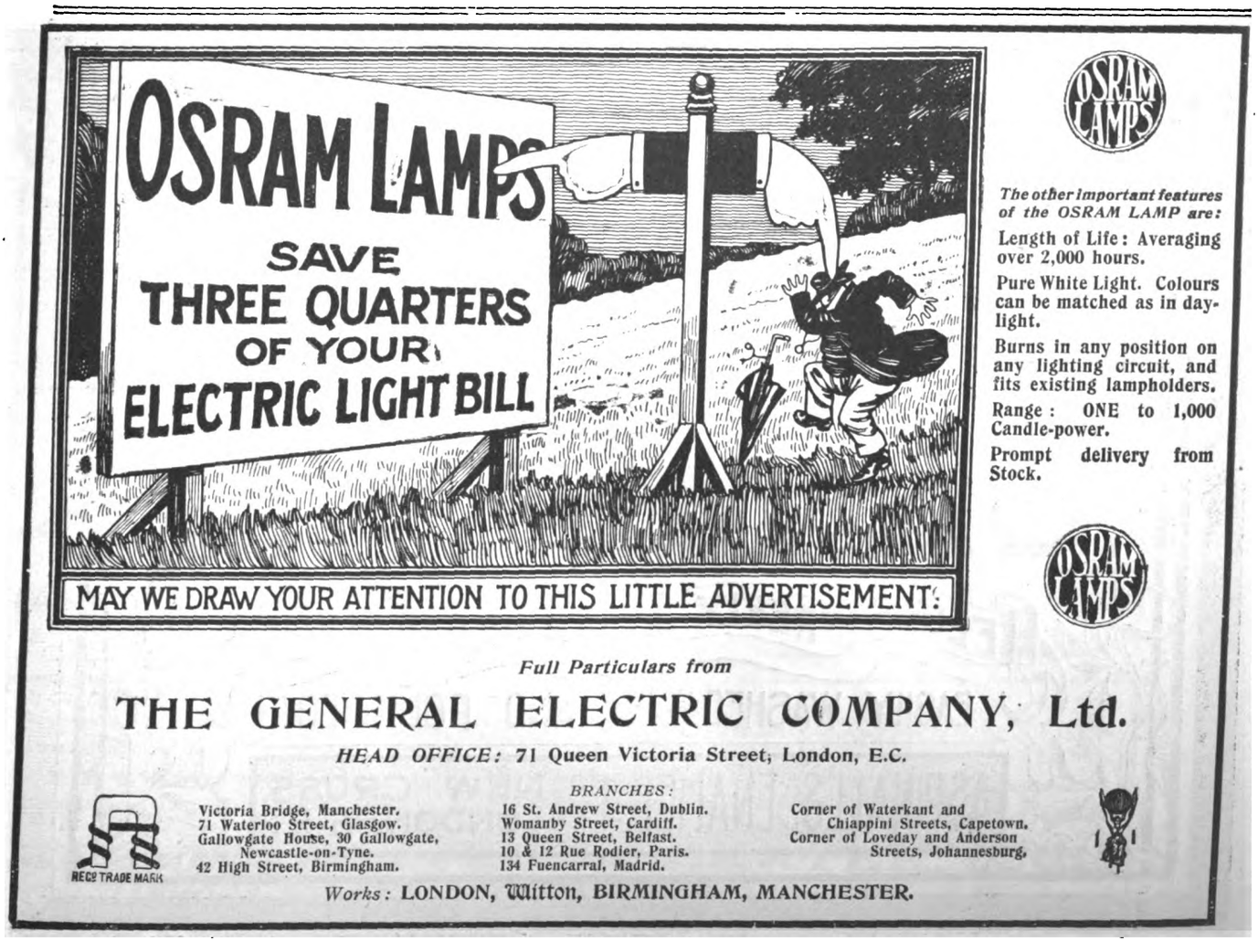
For taking down and removing the whole of the corrugated iron structure now on the playground of Francis Avenue school, and re-erecting the same with alterations on a site at the rear of the Municipal College, for the Portsmouth education committee.

Chambers	£931 11 6
Carline	678 0 0
Crockerell	557 0 0
Light	545 0 0
Thomas	495 0 0
Pryer & Sons	489 10 6
Jones & Son	487 0 0
Salter	480 0 0
Tanner	430 0 0
Burton & Boyce	399 10 11
Privett (*accepted*)	347 0 0

ROUNDHAM.

For alterations and additions to the Travellers' Rest Inn. Mr. A. W. Yeomans, F.R.I.B.A., architect, Chard.

Draper & Son	£560 4 10
Pittard & Son	393 0 0
Spiller	369 0 0
Relleen & Griffiths	359 0 0
Bishop & Son	357 0 0
Fowler & Harris, Chard (*accepted*)	350 0 0



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RUNSWICK.

For the construction of a timber lifeboat house and slip on concrete foundations at Runswick, in the East Riding of Yorkshire. Mr. W. T. Douglass, M.I.C.E., engineer and architect, 15 Victoria Street, Westminster, London, S.W.

Fletcher	£1,594 16 4
Cole	1,439 7 10
Brebner	1,416 0 0
Lander & Co.	1,400 0 0
Exors. of J. Arundel, Bradford (*accepted*)	1,370 5 0

RUGBY.

For headquarters for Howitzer Battery. Mr. J. H. Liddington, architect and surveyor, Rugby.

Linnell & Son	£2,672 0 0
Parnell & Son	2,655 0 0
Foster & Dicksee	2,620 0 0
Hollowell	2,489 0 0
Cockerell, Rugby (*accepted*)	2,480 0 0

SCOTLAND.

For the continuation and extension of the works at Burncrooks reservoir, for the Clydebank and District Water Trust.

Shanks & M'Ewan	£31,489 0 0
Smillie	30,223 0 0
Muirhead & Co.	29,909 0 0
M'Callion	29,401 0 0
Blair	28,640 0 0
Jackson	26,000 0 0
Kinniburgh (*accepted*)	25,985 0 0
Pirrie & Sons	24,454 0 0

For additions to the Craigmhor private hotel. Mr. Alexander Cattanach, architect, Kingussie.

Accepted tenders.
J. & D. Macdonald, mason.
D. & M. Fraser, joiner.
R. & L. Macpherson, plasterer.
Dunbar & Macpherson, painter.
Cattanach, plumber.
Reid, slater.

SCOTLAND—*continued.*

For laying a new main from Cullalo reservoir to Burntisland. Mr. Waddell, burgh surveyor.

Robertson, Inverkeithing (*accepted*)	£4,446 0 0

STIFFORD.

For repairs to roofs, spire, and internal work to Stifford Church. Mr. C. M. Shiner, A.R.I.B.A., 10 John Street, Adelphi, W.C., and Grays, Essex.

Bruty	£203 10 0
Hammond & Sons	172 0 0
Carter	126 0 0

WANSTEAD.

For laying sewer and drains, and for paving, &c., in connection with The Elms improvement, High Street. Mr. C. H. Bressey, surveyor, Wanstead, N.E.

	Woodford Road, Kerb, &c.	The Elms Improvement
Coxhead	£386 0 0	£557 0 0
D. T. Jackson	333 12 4	681 9 4
Paul	324 14 5	539 13 7
Adams	324 12 11	684 6 0
Parry & Co.	316 9 1	599 8 1
Wilson Border Co.	316 1 3	606 11 4
Bell & Sons	306 1 1	544 15 7
Mowlem & Co.	304 0 0	547 0 0
Gibbons	303 18 8	628 0 5
Anderson	302 0 1	610 13 6
Manders	300 2 9	586 15 8
Glenny	293 13 2	755 19 11
Griffiths & Co.	293 4 9	549 5 6
Hanson	292 0 0	619 0 0
J. Jackson	288 5 10	498 3 1
Parsons & Parsons	282 7 4	528 10 3
Porter	280 9 9	562 15 2
W. & C. French, Buckhurst Hill (*accepted*)	278 0 0	510 0 0



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ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 22, MR. JOHN W. SIMPSON, F.R.I.B.A. NO. 23, MR. A. N. PRENTICE, F.R.I.B.A.

COMPETITION DESIGN FOR TRAINING COLLEGE, HULL.

CHURCH OF ST. ANSELM AND ST. CECILIA, KINGSWAY.

DETAIL OF COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

OXFORD COLLEGE SERIES, BRASENOSE.—CHAPEL—ORGAN SCREEN IN CHAPEL.

WEST NORWOOD.

For the erection of a home in Wolfington Road, for the Committee of the Jews' Hospital and Orphan Asylum. Messrs. JOSEPH & SMITHEM, architects.

Trollope & Colls	£7,839	0	0
Cubitt & Co.	7,667	0	0
Hudson Bros.	7,359	0	0
Higgs & Hill	7,184	0	0
Greenwood	7,137	0	0
Wallis & Sons	7,132	0	0
Holliday & Greenwood	6,977	0	0
Moss & Sons	6,850	0	0
Lawrence	6,842	0	0
MINTER (*accepted*)	6,700	0	0

Received too late for Classification.

BIGGLESWADE (BEDS.).

For alterations to Brook House, Market Square, Biggleswade, for J. F. A. Maythorn, Esq. Mr. THOMAS COCKRILL, A.M.Inst.C.E., architect, Biggleswade.

Bailey & Sons	£480	0	0
Bartle & Son	445	0	0
WRYCROFT & SONS, St. Neots (*accepted*)	425	0	0

For installing heating apparatus in the Courier Printing Works, for Messrs Spong & Son. Mr. THOMAS COCKRILL, A.M.Inst.C.E., architect, Biggleswade.

Fisher & Son	£58	0	0
Miller	50	0	0
BACCHUS, Bedford (*accepted*)	48	0	0

NEW CATALOGUES.

THE Meadow Foundry Co., Ltd., have prepared for the use of civil and sanitary engineers, surveyors, and contractors a catalogue of their sewerage, sanitary and municipal ironwork and appliances. Among them is an improved slag-heating furnace for making tarred macadam, and a patent smokeless furnace, as well as indispensable things like gulley grates, ventilating shafts, valves, and street lamps. Special attention is drawn to the "Mansfield" improved ash or dust shoot, as being the only silent and complete shut-off and dust-proof shoot on the market, and as especially suitable for flats and other large buildings where the architect requires something more satisfactory and sanitary than the cheap and common form of shoot.

THE catalogue of Messrs. J. Carter, Sons & Co., Ltd., Manchester, indicates the extraordinary variety of tools that are now required in mechanical engineering. As the company was established ninety years ago, it would be interesting to discover how many of the prodigious number of tools illustrated and priced in their latest lists were known in the first quarter of last century. Many of the trades now catered for were then unknown. The very comprehensive list ranges from pliers to screwing machines, or cranes and travellers.

ALTHOUGH scarcely two years have elapsed since the "Margewood" locks were introduced into an already well-stocked market they are now recognised as an almost perfect lever lock. The reason for their success is, that at the very point where all ordinary lever locks were weak the Margewood patent is especially strong. The two main mechanical improvements are (1) that the bolt and levers are pivoted together instead of being separate working parts, and (2) the lever stump is rigid with a double bearing or support in the lock-plate instead of being weak through its single bearing. As a consequence the lock becomes both stronger and simpler, for the bolt cannot be forced without shearing the rigid lever stump and the parts cannot get out of position. The Margewood Locks, Ltd., 11 Clerkenwell Green, E.C., in their latest catalogue illustrate the many varieties of their cabinet and building lever locks, in all of which the same principle is embodied. The locks are almost a revolution in the accepted methods of lock manufacture, and have attracted very general

BY SPECIAL APPOINTMENT
TO HIS MAJESTY.

Scagliola Marble

An old Italian process, revived in the early part of the Sixteenth Century by Guido Sassi; is not a surface decoration, but a thoroughly artistic material. It was largely used by the Florentines in some of their most elaborate works, and was introduced into this country by Mr. J. Wyatt about 1750. It has been manufactured by this firm for the last 85 years, and fixed in many of the most important buildings in the Kingdom.

SPÉCIALITÉ for surrounding Iron or Brick Cores.

These being fixed in the ordinary course of construction the SCAGLIOLA can afterwards be fixed round WITHOUT SHOWING JOINT.

Prize Medals, 1851 & 1862.

A DECORATIVE MATERIAL of the RENAISSANCE WHICH HAS STOOD THE TEST OF CENTURIES.

COLUMNS,
PILASTERS,
WALL-LINING, DADOS,
and all forms of INTERNAL DECORATION.

Descriptive Circular on Application.

RECENT WORKS:

New Sessions House, Old Bailey, E.C. Columns. E. W. Mountford, Esq., F.R.I.B.A.
Municipal Buildings, Crewe. Columns and Pilasters. Henry T. Hare, Esq., F.R.I.B.A.
King's Theatre, Southsea. Proscenium Border, Piers, Architraves, &c. Messrs. F. Matcham & Co.
9 Great St. Helen's, E.C. Wall-lining, Dado, &c. Messrs. Ellwood & Sledmere.
Waldorf Hotel. Columns and Pilasters. Messrs. A. Marshall Mackenzie, F.R.I.B.A., & Son.
Central Library, Islington. Columns. Henry T. Hare, Esq., F.R.I.B.A.
Palace Kapurthala. Columns and Pilasters. Messrs. Waring & Gillow, Ltd.
Leigh Town Hall. Columns and Pilasters. J. C. Prestwich, Esq.

BELLMAN, IVEY & CARTER, Ltd.,
LINHOPE STREET, DORSET SQUARE, LONDON, N.W.
Telephone: No. 4054 Paddington. Telegrams: "Grasp, London."

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attention and admiration, and will shortly be placed upon the market.

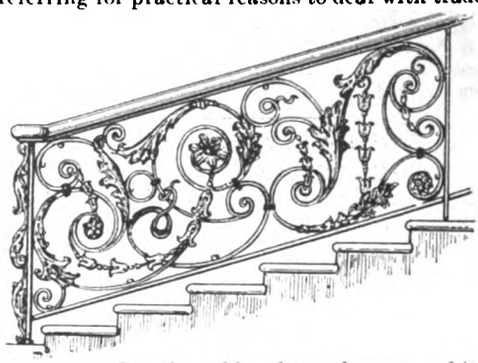
PHILLIPS'S "Monthly Machinery Register," Newport, Mon., has been in existence for no less than thirty-six years. The issue for November contains nearly 130 pages exclusive of the monthly electric machinery, motor-car, and steam wagon supplement. The tariff for displayed advertisements, as well as the prices for entries of new and second-hand machinery for sale, are most moderate. As a consequence an enormous number of the latter are to be found; indeed the total value of the machinery and plant for sale and hire is estimated at 260,000*l*. The publication is of a kind that is kept for reference, and therefore should prove an effective medium for advertisements.

SOMETHING more than a catalogue is the handbook entitled "A Few Suggestions for Ornamental Decoration," of which the second edition is now published by Messrs. Thomas Parsons & Sons, for whilst it tells us of the varnishes and paints now supplied by this long-established firm of manufacturers, it contains a large number of very admirable suggestions in decorative design based upon the work of all periods from Pompeian to l'Art Nouveau, besides many that have the merit of so much originality as to be unassignable to any precise historical period. There are some designs that do not suit our personal taste, but one must recognise that a firm like Messrs. Parsons has to cater for a variety of tastes. Though there are many examples in the book that might be copied straight away, and full permission is given for doing so, the effect upon ourselves is rather that of a stimulant, and when we look through the pages we feel impelled to sit down and make a design of our own. In this way, we take it, the book fulfils its object of offering suggestions. Many of the illustrations are printed in colours, and some of them are quite delightful.

THE Clyde Structural Iron Company, Ltd., are evidently not content with their English and Scottish successes in the execution of difficult work, for their latest catalogue includes photographs of jobs received from Austria, Rangoon, Australia, Ireland and Spain. The firm give special attention to orders received from abroad, and keep a staff for the preparation of designs and drawings to facilitate the work of re-erection after being fitted in their shops at Scotsoun, which are near Glasgow, and in direct communication with the leading railways. But the bulk of the photographs show contracts in hand and complete in Great Britain. These are of many varieties, including railway roofing, electric car-sheds (as at Heaton, where the dimensions are 520 feet long by 180 feet wide in four spans), machine and other engineering shops, brass foundry, tube works, electric power stations at Rangoon, Dundee, Spennymoor, a drill hall at Leith, grand stands at Newcastle, Twickenham, Fulham, Chelsea and Kilmarnock, several railway foot-bridges, steel hoppers and roofs. The catalogue concludes with some thirty sketches of the kinds of work the firm undertake, and it is stated that they are ready to prepare special drawings and submit estimates free of charge, or to send a representative. The Clyde Structural Iron Company, Ltd., are happy in the possession of a high reputation, which has spread to many parts of the globe, as well as all over this country.

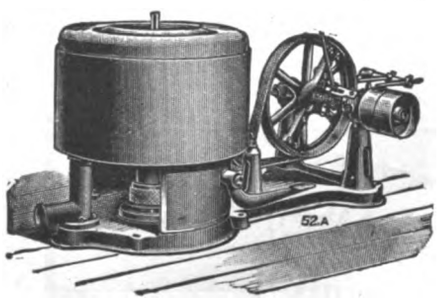
TRADE NOTES.

AN expression of regret is sometimes heard that architects too rarely entrust the metalwork of their buildings to craftsmen, preferring for practical reasons to deal with trade firms.



It is unfortunate that the golden days when an architect was surrounded by a troop of earnest craftsmen all working in concert seem to have vanished beyond recall. It is now wisest, while accepting the situation philosophically, to devise some method of improving the results

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HYDRO-EXTRACTORS



FINEST "HYDRO" MADE.
POTT, CASSELS & WILLIAMSON,
MOTHERWELL.
CATALOGUES FREE.

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RICH SILK WALL PAPER.
Excellent effect for panelling and general high-class decorations. Large variety of designs and colours now on view at Showrooms as below...
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Wall Paper Manufacturers, Ld.
LINCRUSTA WALTON BRANCH,
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LONDON & LANCASHIRE FIRE INSURANCE COMPANY
Security £4,607,705.
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FIRE — ACCIDENT — MARINE
This Company also issues Policies covering
LOSS OF PROFITS AND INCOME
occasioned by Fire.

SAVE 50%
OF YOUR
COAL BILL
BY USING THE PATENT
"SINE QUA NON" KITCHEN RANGE.
RECENT TESTIMONIAL.
[Copy] 46 Newcastle St., London, E. June 8, 1909.
GENTLEMEN,—You will no doubt be pleased to hear that the "Sine Qua Non" Range we recently had from you is giving every satisfaction; we understand that the amount of coal consumed is practically one half of what the old range consumed.
We are, Gentlemen, yours faithfully,
(Signed for A. EATON & Co., LTD.,)
J. H. STONEHOUSE, Director.
This unsolicited testimonial, with many others, may be seen at, and Catalogues obtained on application to, the Sole Manufacturers,
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11-14 BURY STREET, LONDON, E.C.,
where the above may be seen in action.

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ELECTRIC and HYDRAULIC.
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HAWTHORN ROAD,
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and Cooking Engineers.
NEW CATALOGUE 2 FREE.
W SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.

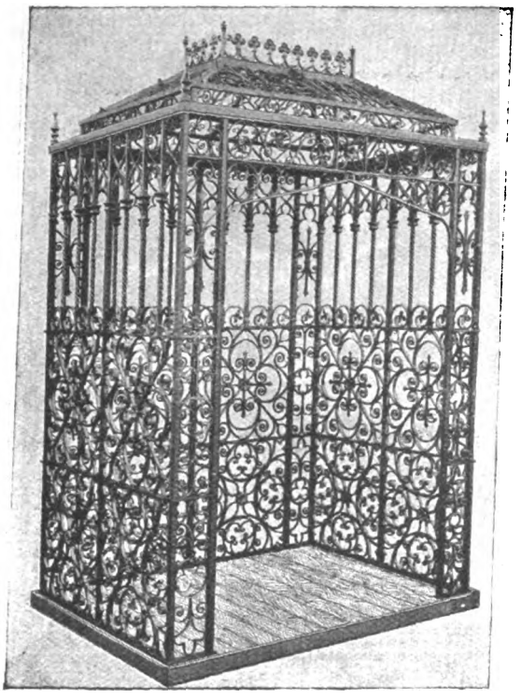
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The Original Solid Braided Sash Line
Made in all sizes from best selected stock. Standard for 40 years. Guaranteed in every particular. Will outwear any other ordinary Sash Line. Specified by the best Architects and Builders. ¶ Write for prices and samples to
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11-12 Great Tower Street,
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obtained by the existing system of trading specialists. There is no need to despair, for (as will be seen by the accompanying illustrations) the work achieved by them is sometimes of no mean order. The larger block shows a lift-cage erected in the Houses of Parliament, which



was made by Messrs. Witchell & Co., whose works are at Brockley, S.E. It would be difficult to improve upon the design, which most happily combines strength and Gothic elegance. The other block shows a staircase balustrade made by the same firm of art craftsmen, which is most suitable for its purpose.

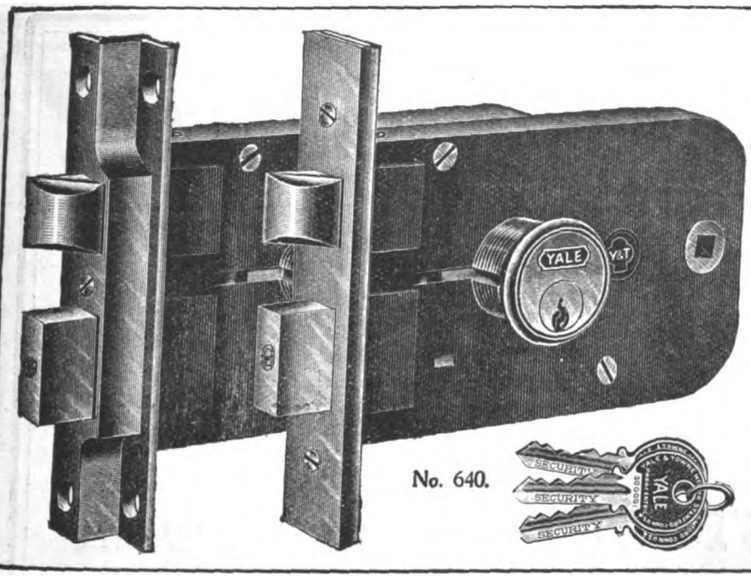
Messrs. Patman & Fotheringham, builders and contractors, 1 Theobald's Road, W.C., have been successful in obtaining the contract for the alteration and reconstruction of No. 2 Seamore Place, Park Lane, W., under Mr. W. H. Romaine Walker, the architect.

Mr. Lewis J. N. Gorton, 40 William Edward Street, Birmingham, has just fully patented a "cleaning" casement, the "Exclusive." It is controlled by two radial arms, one at the top and the other at the bottom, which run in slotted face-plates. The casement opens outwards; as it does so there is a sliding movement of its heel along the metal channels provided in head and sill, consequently when it is opened to its normal position there is a small gap for ventilation on the heel side, but when opened fully for cleaning the casement stands at about right angles to the frame, and the glass can be rubbed on either side face from within the room. The sill channel is also so arranged as to form an effective barrier to wind and driving rain. The casements and fittings on the "Exclusive" principle are supplied as follows:—(1) Steel casements and frames complete; (2) steel casements adapted to wood frames; and (3) fittings for wood casements and frames. The fittings are obtainable in gun-metal, brass, and malleable iron (Berlin blacked). A sheet has been prepared giving full instructions for ordering and fixing, as well as a vertical section and plan.

Messrs. A. & J. Main & Co., Ltd., Clydesdale Ironworks, Possilpark, Glasgow, have received authority to add to their Germiston Works, Petershill Road, Glasgow.

The Lichfield Rural District Council at their last meeting instructed Mr. Robert Green, M.Inst.C.E. (Birmingham), to prepare a scheme for the sewerage and sewage disposal of Streetly, and to report generally upon sanitary questions affecting this district.

The Institution of Municipal Engineers will visit the Surrey Commercial Dock to-morrow (Saturday) morning. The dock is very large, and it is estimated that the inspection of a fairly representative number of cargoes would take about two hours. The woods to be inspected will comprise red or yellow fir or deal, white fir or deal, yellow pine, pitch pine, Oregon pine, spruce, birch, and oak.



The "YALE" Horizontal Mortise Knob Lock.

Manufactured by the Yale & Towne Manufacturing Co., the only makers of genuine "Yale" Locks, whose goods are used and known throughout the world. Established 1868.

Gives the security and convenience of the small "Yale" Key, made in nickel bronze. Possesses unlimited key changes. The latch bolt has "Easy Spring," enabling the door to be closed without noise or slamming or turning the knob. Specification and full particulars forwarded on application.

The Yale & Towne Company
6 City Road, London, E.C.

Telephone No.: Central, 5272. Telegrams: "Yaletowne."

WILLESDEN UNDERLINING PAPER
FOR ALL CLIMATES.
WATER-PROOF. ROT-PROOF. INSECT-PROOF.

For UNDERLINING Slates, Tiles, Iron Buildings, with or without Boards. For LAYING ON JOISTS. Placed under Floor Boards EXCLUDES DAMP and DEADENS SOUND. Also for Damp Walls.

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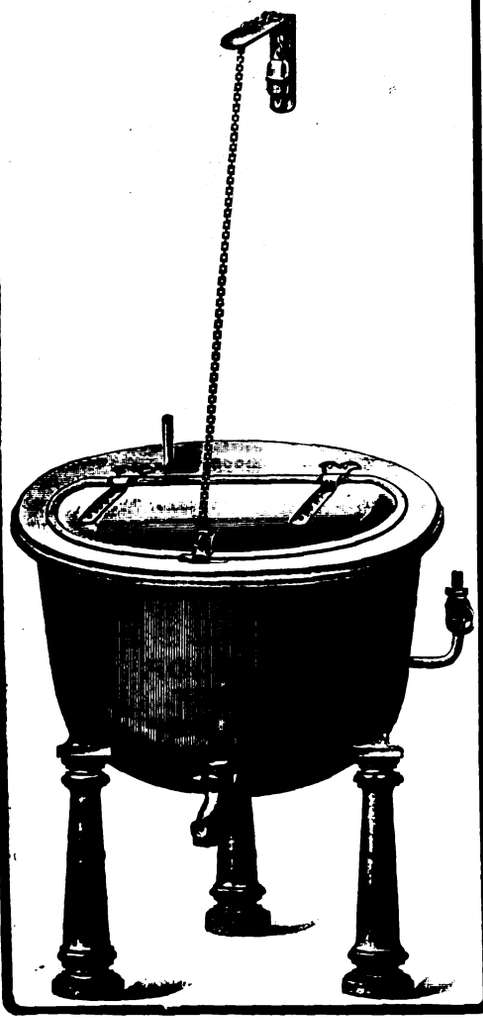
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HOUSES AT HAMPSTEAD GARDEN SUBURB. [*J. Bruce Merson, Architect.*

THESE houses are built on the western side of Hampstead Way in the Hampstead Garden Suburb. They were designed by Mr. J. Bruce Merson, M.S.A., architect, 14 Wordsworth Road, Wallington, Surrey, for and built by the Carshalton District Development Company, Ltd. The walls are of brick, finished outside with a red brick plinth up to height of ground floor window-sills and above that covered with rough cast; the roofs are covered with red tiles, and the woodwork of windows and doors generally is painted green.



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ORIENTAL SANITARY ENGINEERING.*

(Concluded from last week.)

Sewerage Systems.—Owing to the great difference between the amount of water to be dealt with in the dry and the rainy seasons, a "separate" system of drainage is generally preferable. No "combined" system will prove satisfactory where the rainfall in the monsoon exceed 30 inches, for the sewers need to be made such a size that they cannot be self-cleansing in the dry season; besides which there is a greater danger from the formation of sewer gas when such a system is comparatively empty.

Supposing a separate system is being contemplated, the capacity of the sewer should be sufficient to also take all rain water which falls upon roofs and which drains into open private grounds; in fact, all water which does not drain direct into the surface-water drains in the public street. The reason for this is the undesirability of having different connections for sewage and surface water within private premises, as it is generally less costly to make an unauthorised secret connection with a surface-water drain; and as the natives are prone to do this, it is better to put it out of their power to do so.

Should the sewerage line run along a saturated subsoil, it will tend to greatly improve the healthiness of the district if provision is made to deal with such subsoil water. In such a case the provision should be included in the capacity of the lines dealing with the surface water. It is undesirable to admit such into the sewer.

The provision of catch-pits with by-passes is advisable.

Surface-water Gullies.—The depth of the seal of those on the roadside should not be less than 9 inches, as evaporation takes place so rapidly in hot countries. During the dry season it is sometimes a good thing to fill these gullies right up to the top with sand. This allows the small amount of water due to road watering to soak through and prevents foul air from coming out into the street at an inconvenient level. This point suggests the question of ventilation of sewers. Generally, surface-water drains need no ventilating system, as, although the first heavy flow due to the rains may be a little offensive, the deposits are mineral, and as the rains are practically continuous during the monsoon, the first flow is very soon followed by quite inoffensive liquid.

Regarding sewer ventilation, it is desirable that all vent shafts be made of iron and placed so that the sun shines on them as long as possible. The iron, being a good heat conductor, induces a draught from the sewers Of course, such shafts should be raised above level of top windows of surrounding houses.

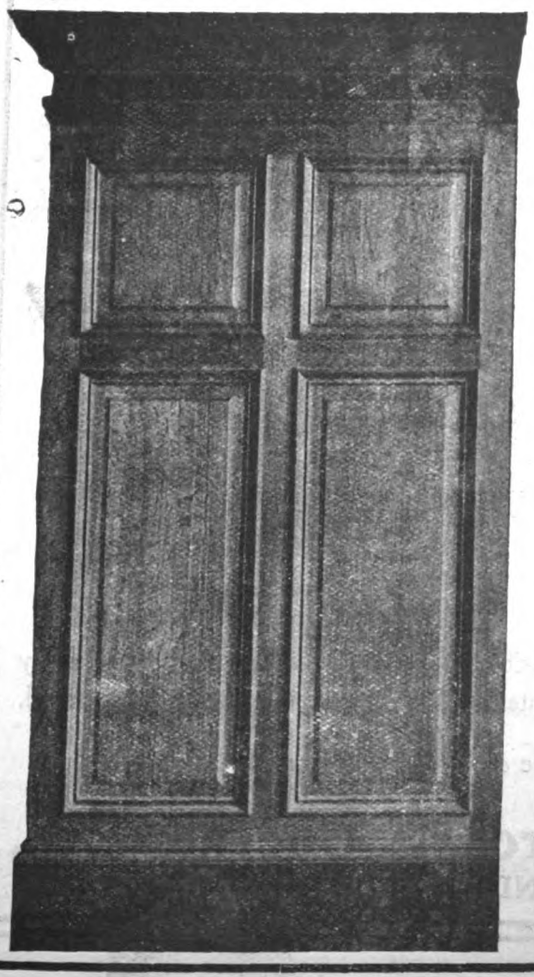
A system of placing charcoal trays in surface manholes has at times been tried, but in any humid climate it is quite ineffective, as it is a necessity of such a system that the charcoal remain quite dry.

Gradients.—The gradients of sewers require to be greater than ordinarily obtain in Great Britain, as the latter are insufficient to remove such general solid matter as finds its way into Eastern sewers. Thus, when detritus finds its way in 5 feet per second may be allowed, and where a domestic sewage 6 feet per second.

House Connections.—Exceeding caution has to be used in providing these. The habits and conditions of life of the natives are very hard to combat. In towns large tenement houses abound, and in each living-room there is a washing place (usually about 30 inches square, with a wall 3 inches high around it) in a corner, which is often used for other purposes. Under such circumstances drainage connections, as understood in Great Britain, are impossible, as they would become hopelessly choked. In such cases night soil is disposed of by hand removal, and the sullage should be dealt with by providing down pipes discharging over traps at the foot, the sullage being carried thence along open drains outside. These open drains should be carried along to drain a convenient number of houses, and at the end one sewer connection is made.

Houses of better class having water-closets must, of course, have separate sewer connections. In this case the depth of seal in any trap should not be less than 6 inches. All branch pipes connecting with the street sewer should be 6 inches, and, although this is theoretically far too large for the amount of sewage, &c., passed along it, it is necessary to prevent possibility of choking the pipes due to so much foreign matter being emptied into these drains wherever provided.

* Abstract from paper read at a Sessional Meeting of the Institute of Sanitary Engineers on November 3 by C. T. Evennette (Fellow).



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There is more danger to public health in providing water-closets in most natives' houses in India than in the want of them. This remark does not refer to the large or substantial houses of native gentry, but even in their case it is often doubtful wisdom to provide direct sewer connections, as their menials are none too careful.

Jointing of Pipes.—Wherever the banyan tree is seen to be growing near the line of sewers, a good patent jointed pipe should always be provided, as the roots of these trees are most insidious, and in their search after water they will always get through even a cement-jointed pipe.

Public Bathing Places.—These have also to be considered in drainage schemes. The municipal engineer is called upon to provide them. They are generally made somewhat as follows:—A certain area is strongly paved within four walls having a partition wall running along the length, dividing it into compartments for males and females. Two troughs, like large deep horse water-troughs, run parallel to and abut against the partition wall. At one end of the trough a ball cock is provided to keep the water at one level. Bathers come with brass vessels, which they use to dip out water which they throw over themselves. By inclining the floors inwards or outwards, and connecting with the nearest drain, the place is kept efficiently drained; besides which, the water draining from those places is found very useful for helping to flush the surface roadside drains near by.

Public Wash-houses.—Every town having a drainage system and a pipe-water supply should be provided with these, for the insanitary way in which clothes are washed by the natives, if left to find a washing place themselves, is a grave source of danger to public health.

A typical wash-house is made by paving a sufficient surface of ground with smooth stones or concrete, and jointed and set in cement. In the centre of this platform a long trough is built, and fitted with a ball cock to keep the water in the trough at a constant level. Along both long sides of this trough smaller tanks are constructed at close intervals, which tanks the washerman or woman fills by hand from the large central trough. Opposite each small tank a raised and inclined stone slab is provided, upon which the clothes are beaten.

Along one whole side of this washing place, outside the line of slabs, a covered-in shed should be provided, within which clothing can be boiled.

Sewage Disposal.—Except in some large towns of the first importance in the East, it will be found that the sewage is applied to the land or buried. Most municipalities are too poor to contemplate any change, even if desirable, whilst generally it is not really at all necessary.

Providing solids and liquids are kept as separate as possible, no great nuisance arises through smells. When the soil is buried, providing it is deposited in shallow trenches, it is quickly and harmlessly disposed of. If the night soil is passed on to the land, providing the latter is porous so that nitrification can rapidly take place, this method—the most general—will remain the most general for many years to come. It is the natural disposal of a natural product, and, following Nature's cycle, it is life to the vegetable world, which in turn sustains the animal.

Municipal Buildings.

Slaughter-houses.—In India religious prejudices render it necessary that pigs, sheep, and bullocks be slaughtered separately, since the Hindu looks upon the bull as a sacred animal, whilst the pig is an abomination to the Mahomedan. The buildings are designed upon common principles obtaining elsewhere—all that is necessary to specially point out is that both Hindu and Mahomedan calendars authorise numerous fairs and festivals. These very much augment the average daily requirements, so that the floor space required, reckoned according to the population, should be increased by 50 per cent. The water-supply and other auxiliary supplies should be allowed for in proportion.

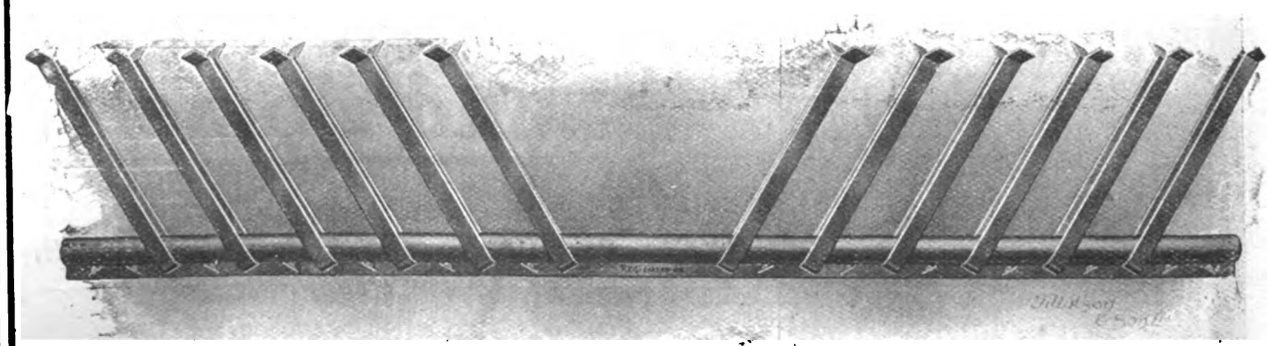
Also, taking into consideration the average menial native's objection to do work too thoroughly, it is not advisable to slope the floors towards drains. Sloping not only causes the floors to be more difficult to retain a footing on, but the after cleansing is not so efficiently done, as the native will simply sluice them down with water; whereas if the floor be on the level, manual labour with squeegees will be an absolute necessity, thus efficiently cleansing the place.

Latrines—Public and Private.—These should be built so as to ensure (1) protection from the sun and rain; (2) thorough ventilation; (3) receipt of solids and urine by

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separate receptacles, as the admixture causes a more offensive smell; (4) privacy; (5) a water-tight floor.

Markets.—Religious prejudices in the case of markets also require that separate provision in distinct buildings be made for the sale of vegetables, grains and fruits, each separate form of animal and feathered flesh, fish, and for dry goods. It is better, from a sanitary point of view, to support the roofs with iron stanchions, and the buildings should be lofty. The floors should be at least 2 feet above ground level, and a drain should be laid down the centre of every gangway. There should be generous latrine accommodation near, and also refuse bins supplied with covers.

Hospitals.—Some form of hospital accommodation is introduced everywhere under British rule. It is curious to know that from about 300 B.C. up to the occupation of India by Great Britain, little or no hospital accommodation existed for the people; although King Asoka, who lived in the third century B.C., ordered the provision of hospitals throughout his kingdom, and his edict is kept in memory to this day by an engraving on the rocks at Girinar in Guzerat. The population of a place in the East is no certain factor to work upon in deciding the necessary provision of beds, &c., as a large number will not resort to a hospital under any consideration. An average, however, is about one bed per 1,000 souls. For an administrative hospital about 1,500 super. feet of site per bed is a fair average figure with which to calculate the site area required for hospital buildings, including offices, in the East.

Regarding choice of site, a site having a low subsoil water level which is permanent is best, and, if no such place can be found, the subsoil water level should invariably be lowered by drainage. No hospital should be built on "made" soil, or if it is imperative to do so the site should be covered with a thick layer of concrete. The buildings should face so that winds from a malarial district do not blow in through the windows, but should no such dangerous winds prevail, the windows should face in the direction to enable the most generally prevailing winds to find entry.

In malarious climates ward floors should be about 10 feet from the ground, with through air space beneath, and in ordinary damp climates should be raised by means of arched basements to a height of 3 or 4 feet to secure air space beneath.

Building Materials.—A very large number of sun-dried bricks are made in India. These are called "kutcha" bricks, in distinction to burnt or kiln bricks, which are termed "pucka." These two terms are also colloquially used to express ripe and unripe, good and bad, permanent and temporary, &c.; *e.g.*, a "pucka" appointment is a "permanent" one; if a native considers you "kutcha" it is the reverse of complimentary! Please excuse this digression. It is not desirable to use "kutcha" bricks in places infested with white ants, and buildings constructed with such bricks should always be coped with "pucka" brickwork, and the roof eaves should project well, to keep rain off the walls as much as possible. There is a variety of limestone extensively found in India called "kunkur," which is most useful. It is a subsoil tufa formed by the depositing of calcareous matter extracted in particles from sand and clay beds by surface waters and redeposited in a concentrated form. When the redeposit takes place in a clay bed a hydraulic limestone is the result. It is necessary to remember that lime made from kunkur—which is a marl lime—will not stand any admixture with such material as powdered burnt clay or brick without such materials lessening its natural strength.

In making mortar in India a small quantity of very coarse sugar, called "gow," is often used with distinct advantage to the strength of any fat lime. In this matter it should be remembered that no sugar must be used for any mortar made partly with powdered brick, termed in India "soorkee." "Soorkee" mortar is made of one of lime, one of sand, and one of powdered burnt clay or brick, except when rapid setting is required, when the proportion of soorkee is increased and sand decreased. A very good artificial cement is made from one of soorkee to one of lime.

Regarding timbers in construction work teak and sal wood best resist attacks by insects, while the banyan tree wood, although useless for ordinary work, being light and brittle, is very useful under water for use as well curbs, &c. Timber from the cotton tree is also very useful for work under water.

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The British municipal engineer serving in the East is a conscientious and very hard-working individual generally, with responsibilities mostly far in excess of those falling to the lot of engineers in the same relative position in Great Britain. The former's task, on the whole, is rather dreary. He receives scant recognition from the native communities he endeavours to serve, and not more from his own country, although his "common sense" and initiative are oftener, of necessity, called into requisition. (One seldom hears of a successful municipal engineer abroad being selected by any municipal body at home, although applications are made more often than is generally known.)

The average native contractor's qualification to undertake a work is, as often as not, solely a financial one. Under these circumstances the municipal engineer's lot with a sanitary work of any importance in hand can easily be appreciated.

THE President of Pennsylvania Railroad has announced a project for the erection of a new union passenger station at Chicago to cost not less than $25,000,000.

MR. EASSON, civil engineer, Glasgow, has been asked by the Dunfermline Corporation to prepare a report as to the expediency and cost of establishing purification works at the south side of the town, and continuing the present pipe to Charlestown.

THE Annan District Committee of Dumfriesshire County Council last week adopted the scheme reported upon by Mr. James Watson, C.E., Bradford, and Mr. James Barbour, C.E., Dumfries, for the taking of a water supply for the Lower Annandale special water supply district from a reservoir of 60,000,000 gallons capacity, to be constructed on the river Mein at Torbeckhill at a total estimated cost of 49,000*l*.

MR. WILLIAM SHEFFIELD, the founder of the firm of Sheffield Bros., builders and contractors, of Dalston, died at his residence, Cranbrook, Manor Road, Stoke Newington, last week. Mr. Sheffield was born in 1828. He came to London when eighteen, and later went to Australia, where for years he carried on business as builder and contractor. On his return to London he settled in Stoke Newington.

THE COMPULSORY ISOLATION OF APPARENTLY HEALTHY PERSONS.

OF recent medical developments nothing is more important than the discovery that persons in apparently good health are capable of carrying infectious germs for an indefinite period and distributing them. These "carriers" are obviously a danger to the community, and every effort is being made in hospitals and laboratories to find some effective means of driving the objectionable bacteria from the systems of afflicted persons.

The recent action of Sir William Collins in drawing the attention of Parliament to the detention of five soldiers at Millbank Military Hospital at once interested the general public in a matter that has hitherto been confined to professional circles. These soldiers, as the result of close observation by army surgeons, were strongly suspected of harbouring and excreting the bacillus of typhoid. All five of the soldiers referred to exhibited no signs of ill-health beyond the excretion of the bacilli. Mr. Haldane admitted that so far no cure had been effected by the use of vaccines at Millbank, though persisted in for many weeks, and he added that cases had been recorded in which the bacilli were excreted by typhoid patients two years after they had been discharged from hospital as "cured."

Early in 1908 the then medical superintendent of the Monsall Fever Hospital at Manchester—probably the largest institution of its kind in this country—contributed to the medical journals a note on the internal treatment of typhoid fever on antiseptic lines. He used medical Izal Oil with remarkable results. It was found that when the drug was administered for a sufficiently long period the bacilli of the coli-typhoid group usually disappeared, and the patients were discharged free from any suspicion of being "carriers." During the first year that this internal antiseptic treatment was introduced at the Monsall Hospital the case mortality from enteric fever was the lowest on record for that institution. It will not unlikely prove that the remedy for chronic "carriers" will be found in the internal administration of antiseptics such as medical Izal Oil, a method of treatment now being extensively used in fever hospitals at home and abroad.

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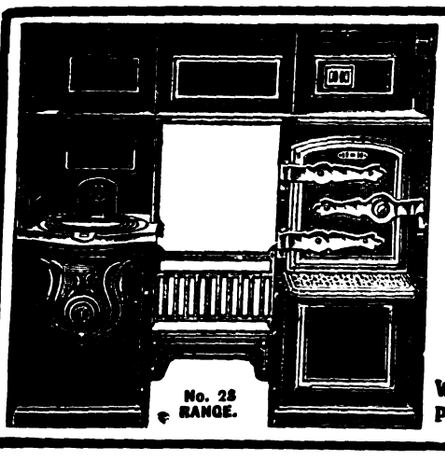
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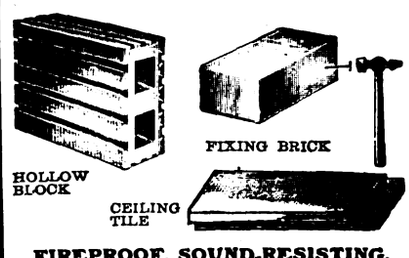
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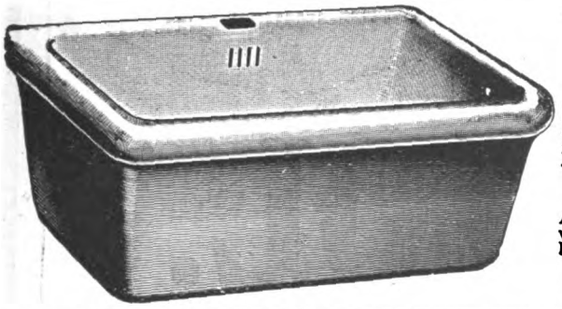
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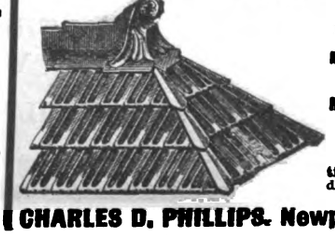
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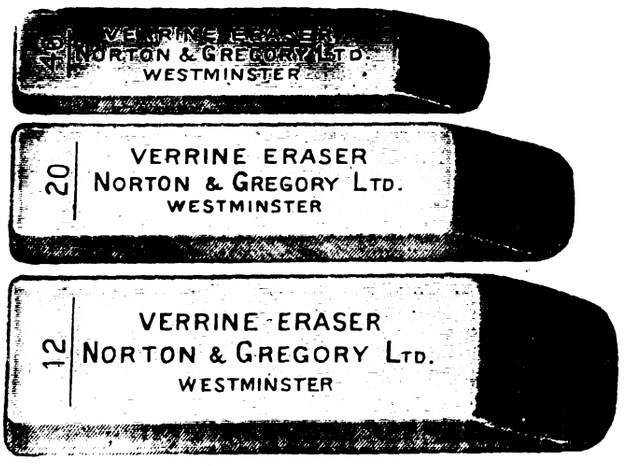
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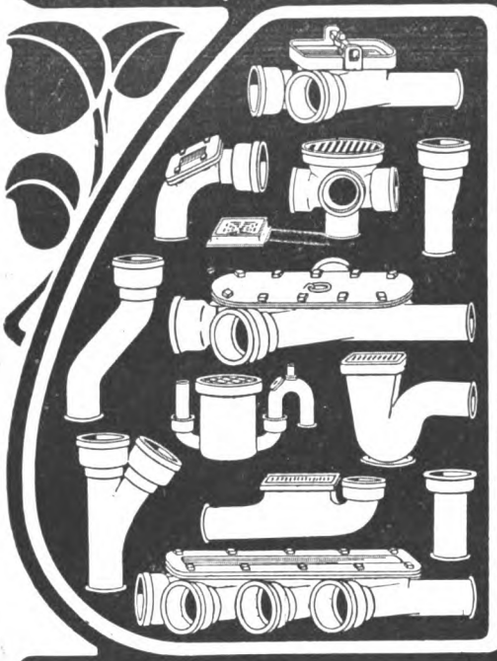
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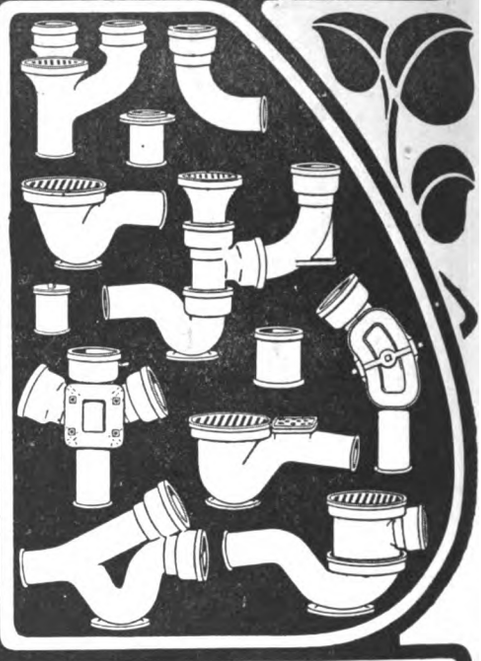
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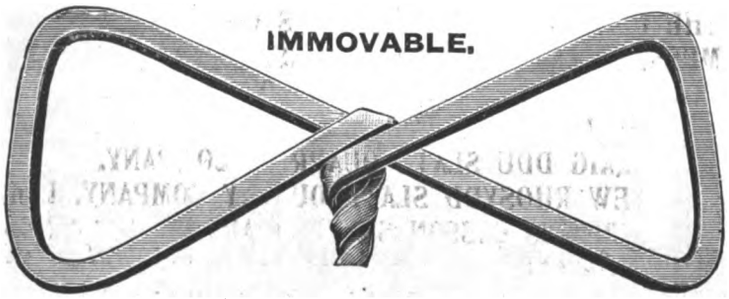
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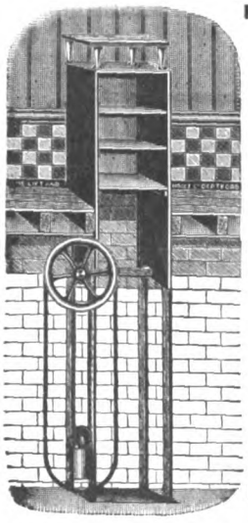
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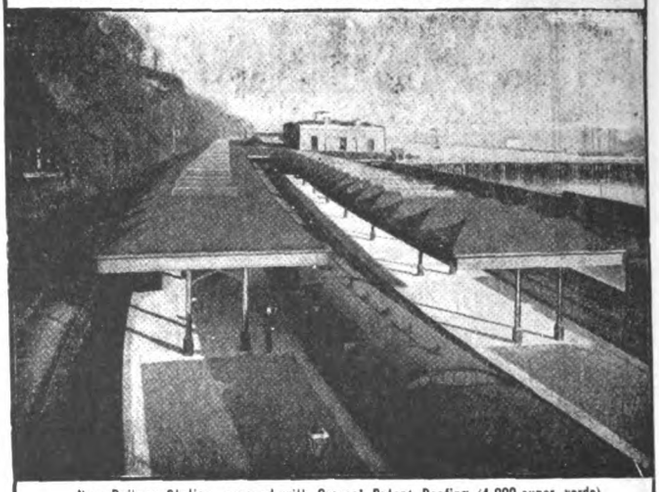
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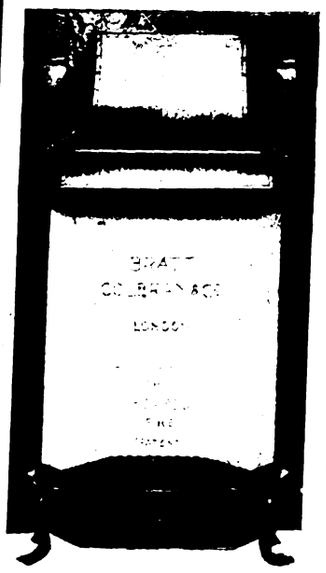
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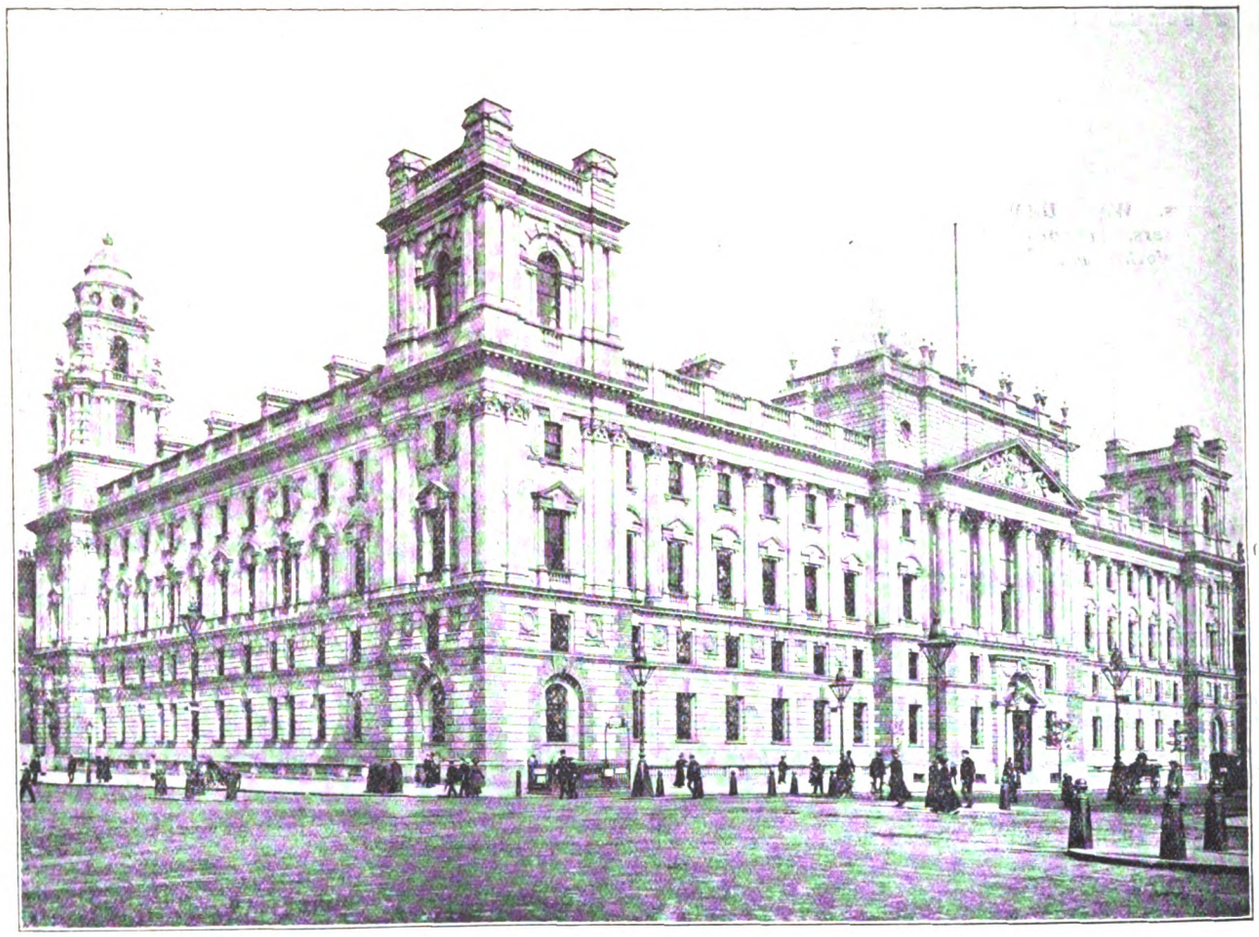
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THE

Architect and Contract Reporter.

FRIDAY, NOV. 26, 1909.

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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

HERNE BAY.—Nov. 30.—The Urban District Council invite designs for a pavilion to be erected on the proposed pier extension at a cost of 4,000*l.* Premiums of 25 guineas and 10 guineas. Deposit 1*l.* 1*s.* Mr. Joseph Jubb, clerk, Town Hall, Herne Bay.

IRELAND.—Dec. 1.—The Tralee Urban District Council invite designs for a proposed Carnegie library and technical school, to cost not more than 4,500*l.* Premiums of 20*l.* and 10*l.* The Town Clerk, Tralee, Ireland.

LEAMINGTON.—Dec. 3.—The Council offer a prize of 10*l.* for the best design for an extension of the cooling-room at the pump-room and baths. Mr. Leo Rawlinson, town clerk, Leamington, Warwickshire.

LEEDS.—Dec. 18.—The education committee invite architects practising in Leeds to submit designs for proposed training college for teachers, Kirkstall Grange, Far Headingley. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist the committee. Deposit 2*l.* 2*s.* Mr. James Graham, Secretary for Education, Education Department, Leeds.

MINEHEAD.—Dec. 11.—For a shelter with cloak-room and lavatories, on the beach at Minehead, Somerset, to cost not more than 3,000*l.* Deposit 5*s.* Premium 20*l.* The premiated plans to become the property of the Council; or, in event of the architect carrying out the work, the premium will merge in the commission. Mr. L. C. Webber-Incledon, clerk, 16 Park Street, Minehead, Somerset.

OLDHAM.—Feb. 1.—The Town Council invite competitive designs from architects practising or residing within the borough for an extension of the town hall. Premiums of 50*l.*, 30*l.*, and 20*l.* are offered, together with 5*l.* for every competitor who carries out the instructions. Apply to Mr. E. C. Foote, borough surveyor, Oldham, Lancs.

OTLEY (YORKS).—Dec. 3.—The Governors of Prince Henry's Grammar School invite applications from architects willing to submit designs and estimates for new school buildings in Farnley Lane. It is intended to allow from twenty to twenty-five competitors. Apply to Mr. Ernest S. Mead, clerk to the Governors, East View, Otley.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

WORKINGTON.—Nov. 30.—The Cumberland education committee invite architects to submit sketch plans with outline specification and estimate for a technical and secondary school in the borough of Workington, Cumberland, for about 300 pupils of both sexes. Deposit 1*l.* 1*s.* Mr. C. Courtenay Hodgson, secretary, The Courts, Carlisle.

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CONTRACTS OPEN.

BAILDON (YORKS).—Nov. 30.—For removal of wooden golf pavilion at Cobble Hall, Leeds, and its re-erection at Baildon. Mr. L. Thorpe, secretary, Golf House, Baildon.

BARROW-IN-FURNESS.—Dec. 2.—For the provision of apparatus, &c., required in the equipment of the plumbing laboratory at the technical school. Director of Education, Town Hall.

BIRKENHEAD.—Dec. 23.—For construction and erection of a block of buildings for the carburetted water-gas plant, comprising a boiler house with tall chimney, machinery house, steel framed generator house and annexe filled in with brickwork, and a meter house, together with other works, at the gas works, Thomas Street, Birkenhead. Deposit 3*l.* 3*s.* Mr. T. O. Paterson, M.I.C.E., gas works, Thomas Street, Birkenhead.

BLACKBURN.—Dec. 13.—For erection of police station, sessions court, &c., on Blakey Moor (basement and lower ground floor section). Deposit 1*l.* 1*s.* Send names at once to Messrs. Briggs, Wolstenholme & Thornley, and Messrs. Stones & Stones, joint architects, Richmond Terrace, Blackburn.

BRIDGWATER.—Nov. 30.—For alterations of new offices, Eastover, and erection of corrugated iron store. The Council's engineer and surveyor, Binford Place, Bridgwater.

BROMLEY.—Dec. 7.—For erection of a fire station and a mortuary. Deposit 2*l.* 2*s.* The Borough Engineer, Municipal Offices, Bromley, Kent.

CASTLEFORD.—Nov. 29.—For the shop-fitters' work in connection with new branch premises in Vickers Street, Castleford, Yorks., for the Castleford Co-operative Industrial Society, Ltd. Deposit 1*l.* 1*s.* Mr. J. Philip Padgett, architect and surveyor, Carlton Chambers, Castleford.

CLAY CROSS.—Nov. 30.—For additions to the Primitive Methodist Sunday schools, Clay Cross, Chesterfield. Mr. H. Harper, architect, 54 Long Row, Nottingham.

CROYDON.—Dec. 15.—For additions to the Croydon Isolation Hospital, near Mitcham Junction, Surrey, comprising a twelve-cubicle ward, pavilion, additions to administrative block, two cottages, and other works. Deposit 5*l.* Send names by Nov. 29 to Mr. Robert Masters Chart, F.S.I., surveyor to the Council, Croydon.

DARLEY DALE.—For erection of a Primitive Methodist church and school at Rowsley, Darley Dale, Matlock Bath. Deposit 1*l.* 1*s.* Apply to Mr. D. M. Wildgoose, architect, Edge Road, Matlock.

EDINBURGH.—Dec. 1.—The Commissioners of H.M. Works and Public Buildings are prepared to receive tenders for the structural work, Royal Scottish Academy (new galleries). Deposit 1*l.* 1*s.* The Principal Architect, H.M. Office of Works, Parliament Square, Edinburgh.

ELLAND.—Nov. 30.—For the erection of a house, surgery, garage, boundary walling, &c., in Victoria Road, Elland, Yorks. Mr. Fred F. Beaumont, architect, Southgate Chambers, Halifax.

EPSOM.—Dec. 10.—For erection of a fire station on land adjoining the Council offices at Church Street. Deposit 3*l.* 3*s.* Mr. Edward R. Capon, surveyor to the Council, Church Street, Epsom.

ERDINGTON, NEAR BIRMINGHAM.—Nov. 30.—For the erection of the following buildings, for the Erdington Urban District Council, viz.:—Public lavatories, Orphanage Road and Woodend Road; tramways waiting-rooms and lavatories at Chester Road; open-air swimming-baths, boathouse, landing stage, &c., small bridge spanning stream, and shelters at the new reservoir park. Deposit 5*l.* Mr. Herbert H. Humphries, engineer and surveyor, the Council House, Erdington.

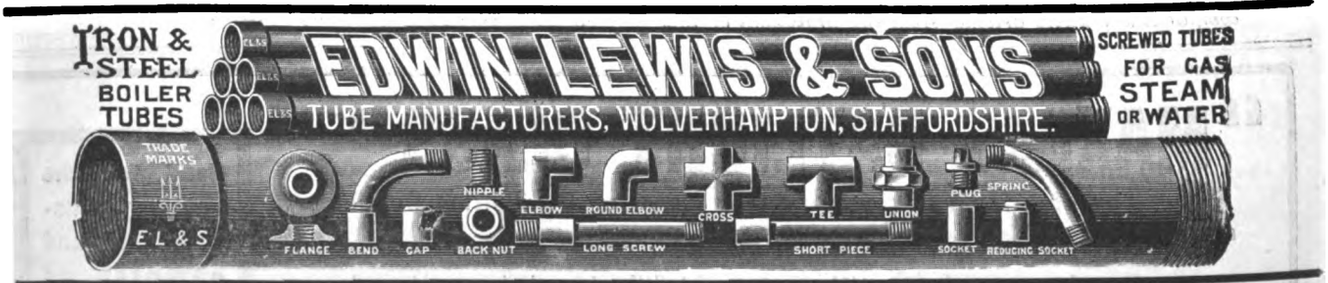
FALMOUTH.—Dec. 3.—For erection and completion of a dwelling house at Trerose, Mawnan. Plans and specifications may be seen at 6 Treruffe, Redruth.

FALMOUTH.—Nov. 27.—For the following works for the Corporation:—(*a*) Alterations to the entrances to Messrs. Fox & Co.'s office, in Arwenack Street; (*b*) laying water supply from the foot of Trelawney Road to the cattle trough at Berkeley Place. The Borough Surveyor's Office, Municipal Buildings, Falmouth.

GATESHEAD.—Dec. 7.—For extending and altering engine shed for the North Eastern Railway. Mr. William Bell, the Company's architect, Newcastle-on-Tyne.

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GOSFORTH.—Dec. 4.—For building strong room at the Council Chambers. Mr. George Nelson, A.M.I.C.E., engineer and surveyor to the Council, Council Chambers, High Street, Gosforth, Northumberland.

HEYBRIDGE.—Dec. 3.—For taking down and rebuilding Wave Bridge over the Chelmer and Blackwater navigation, at Heybridge, near Maldon, Essex. Mr. Percy J. Sheldon, M.I.C.E., chief surveyor, Tindal Square, Chelmsford.

IRELAND.—Dec. 1.—For the erection of sixteen houses at Paradise Row, for the Kingstown Urban Council. Deposit 1*l.* (2) For additions to the caretakers' apartments, Royal Victoria Baths; (3) for two shelters at the new park. The Surveyor's Office, Town Hall.

IRELAND.—Dec. 3.—For building and fencing 28 single labourers' cottages, for the Letterkenny Rural District Council. Mr. R. S. Watters, clerk, Board Room, Letterkenny.

IRELAND.—Dec. 8.—For erection of proposed Guy's National schools at Ballymena, County Antrim. Deposit 1*l.* Messrs. W. H. Stephens & Sons, 13 Donegall Square North, Belfast.

LEAMINGTON.—Nov. 29.—For the execution of the following work for the Town Council, viz.:—(1) Excavation, concrete and brickwork required for the erection of a greenhouse, 100 feet by 12 feet; and (2) joiners', glaziers' and painters' work needed for the completion of same. The Borough Engineer, Town Hall.

LEEDS.—Dec. 1.—For the adaptation of Nos. 4, 6 and 8 Meadow Lane, Leeds, for a Labour Exchange, for the Commissioners of H.M. Works and Public Buildings. The Assistant-Architect, H.M. Office of Works, Leeds.

LITTLEBOROUGH (LANCS).—For the internal and external renovation of the Central Council, Smithy Bridge Council, and Summit Council schools, for the Lancashire Education committee. Mr. J. A. Grindrod, 32 Lord Street, Rochdale.

LIVERPOOL.—Dec. 6.—The Commissioners of H.M. Works and Public Buildings are prepared to receive tenders for alterations at the County Court offices H.M. Office of Works, Victoria Street, Liverpool.

LIVERPOOL.—Dec. 1.—For the adaptation of premises in Fraser Street, Liverpool, for a Labour Exchange, for the Commissioners of H.M. Works and Public Buildings. The Assistant Architect, H.M. Office of Works, Liverpool.

LONDON.—Nov. 29.—For erection of an additional ward block, an isolation block, and extensions to the administration block at the isolation hospital, World's End, Winchmore Hill, N., for the Enfield and Edmonton Joint Hospital Board. Deposit 2*l.* 2*s.* Mr. Richard Collins, Public Offices, Enfield.

LONDON.—Dec. 2.—For overhauling the roofs at the Infirmary, St. John's Hill, Wandsworth, S.W. Mr. F. W. Piper, clerk, Union Offices, St. John's Hill, Wandsworth, S.W.

LONDON.—Dec. 13.—The Secretary of State for War invites tenders for the provision of additional accommodation for non-commissioned officers and men in existing barrack block G, Wellington Barracks. Deposit 10*s.* Apply by Dec. 3 to the Office of the Director of Barrack Construction, 80 Pall Mall, London, S.W.

NEWBURN.—Dec. 4.—For erection of two cottages on Leamington Road. The Surveyor, Council Offices, Newburn, Northumberland.

NORTHFLEET.—Dec. 14.—For the erection of fire station, High Street. Deposit 2*l.* 2*s.* Apply at once to the District Surveyor, The Hill, Northfleet, Kent.

SAFFRON WALDEN.—Dec. 2.—For the erection, complete, of a public swimming bath in Hill Street. Mr. A. H. Forbes, borough surveyor, Saffron Walden.

SALFORD.—Dec. 6.—For a new annexe extension, and for sundry alterations to the Salford town hall and offices in Bexley Square. Deposit 1*l.* 1*s.* Mr. James B. Broadbent, A.R.I.B.A., 15 Cooper Street, Manchester.

SCOTLAND.—Nov. 30.—For the erection of a motor garage, with upper storey for chauffeurs, and also of new cellar, at the Station Hotel, Aviemore, Inverness-shire. Messrs. Baillie & Gifford, secretaries, 12 Hill Street, Edinburgh.

SELLY PARK.—Dec. 4.—For the work of erecting Council schools at Pershore Road, Selly Park, near Birmingham, to accommodate 1,250 scholars, for the King's Norton and Northfield Urban District Council education committee. Deposit 1*l.* Send names by Dec. 4 to Mr. John F. Moore, secretary, Education Offices, King's Norton.

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SCOTLAND.—Nov. 29.—For the following works in connection with the erection of new parish church, Ronaldshay Crescent, Grangemouth:—(1) Digger, mason, and brick works; (2) carpenter and joiner works; (3) slater work; (4) plumber and gasfitting works; (5) plaster and cement works; (6) glazier work; (7) ventilation work. Apply to Messrs. Wilson & Tait, architects, Grangemouth.

SCOTLAND.—Nov. 30.—For mason, carpenter, plaster, slater, and plumber works of proposed offices, for the Auction Company Ltd., Stonehaven. Mr. George Gregory, jun., architect, David Street, Stonehaven, N.B.

SKIPTON.—Dec. 4.—For the mason, joiner, plumber, slater, and iron works required in erection of additions to the dyehouse at Belle Vue Mills, for the English Sewing Cotton Company, Ltd. Mr. James Hartley, architect, Skipton.

SWINTON.—Dec. 10.—The West Riding education committee invite whole or separate tenders for the following works, viz.:—Swinton Bridge provided school, alterations and additions (builder, joiner, slater, plumber, plasterer, painter); Swinton Kilnhurst provided school, alterations and additions, builder, joiner, slater, plumber, plasterer, painter, heating engineer). Deposit 1*l.* 1*s.* each The West Riding Architect, County Hall, Wakefield.

WALES.—Nov. 29.—For erection of fourteen cottages, &c., at Capel Llanilltern, near Creigiau, Llantrissant, Glamorganshire, for the Corporation of Cardiff. Mr. William Harpur, M.I.C.E., city engineer, Cardiff.

WALES.—Nov. 29.—For alterations to Penyrheolgerig infants' school, for the Merthyr education committee. Send names by Nov. 29 to the Education Committee's Architect, Deputy-Surveyor's Office, Town Hall, Merthyr Tydfil.

WALES.—Dec. 1.—For the following works for the Glamorgan County Council, viz.:—(1) New Council school for girls at Gilfach Fargoed; (2) new mixed department at the Council school at Glyncorwg; (3) new boys' school, higher elementary school, and caretakers' house at Port Talbot; (4) fencing and levelling playing field at the County school at Ystalyfera; (5) new offices, &c., at the Council school at Pontardulais. The County Council Offices, Westgate Street, Cardiff.

WALES.—Dec. 4.—For erection of Welsh church at Pontycymmer, Garw Valley. Mr. J. Cook Rees, architect, Neath.

WALES.—Dec. 8.—For erection of a workmen's library and institute at Abertridwr. Deposit 3*l.* 3*s.* Mr. Illtyd Thomas, F.S.I., 17 Quay Street, Cardiff.

WALES.—Dec. 13.—For erection of proposed "Garth Rest" for consumptives, Pentyrch, near Cardiff. Deposit 2*l.* 2*s.* Mr. John H. James, M.S.A., architect, Taff's Well, Cardiff.

WALTHAMSTOW.—Dec. 10.—For the erection and completion of a fire station in Wood Street. Deposit 3*l.* 3*s.* Mr. C. S. Watson, town clerk, the Town Hall, Orford Road, Walthamstow.

WARMINSTER.—Dec. 1.—For building proposed additions to Sandhayes, Corsley. Mr. A. F. Long, architect, 53 Market Place, Warminster.

WRENTHORPE.—Dec. 3.—For building heating chamber and installation of hot water heating system at Wrenthorpe school, near Wakefield, for the Stanley district education committee. Mr. Alexander Angus, 128 Northgate, Wakefield.

YARDLEY.—Nov. 29.—For works of drainage, excavation, levelling, construction of paths, pool lavatories, and boundary walls, &c., at the Sparkhill recreation ground. Deposit 3*l.* 3*s.* Mr. A. W. Smith, engineer and surveyor, Council House, Sparkill, near Birmingham.

MR. BASIL MOTT and Mr. Alexander Stenning have been appointed by the Bridge House Estates Committee of the Court of Common Council as expert advisers in connection with the widening of Southwark Bridge and the erection of the new St. Paul's Bridge.

THE Special Works Committee of the Plymouth Corporation at a meeting on Monday considered a communication from the Local Government Board transmitting copy of a letter received from the Association of Trade Protection Societies complaining that the building by-laws prohibited the use of hollow concrete blocks in buildings, and inquiring whether it would be possible for the by-laws to be amended to enable such blocks to be utilised. The Board asked for the observations of the Council on the letter, and intimated that they would be willing to consider any amendment the Council might desire to make. The committee, however, decided that they could not recommend any alteration in the existing by-laws.

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TENDERS.

ALSAGER.

For making up Alsager Road. Mr. H. V. Lynam, surveyor, Alsager.

Bennie & Thompson	£1,209 1 11
Bennett Bros.	1,060 0 0
Sanders & Torrance	1,010 0 0
Macdonald	1,000 0 0
Barlie	987 12 0
Boulton	969 0 0
Taylor & Son	873 2 8
Williams	828 0 0
A. Bullock	795 0 0
W. Bullock, Oakhill (*recommended*)	783 1 0

COLCHESTER.

For technical institute for the District higher education committee. Mr. H. A. Cheers, architect, Twickenham. Quantities by Messrs. Mumby & Sons, 9 Mitre Court, Temple, E.C.

Chambers	£12,965 0 0
Beaumont	12,919 0 0
Saunders	12,720 0 0
Pattinson & Sons	12,450 0 0
Everett & Son	12,335 0 0
Patrick	12,296 0 0
Ward	12,049 0 0
Bennett	11,960 0 0
Fryer & Co.	11,929 0 0
Dobson & Son	11,790 0 0
Jones	11,600 0 0
Lawrence & Son	11,522 0 0
Kenney	11,410 0 0
Spencer, Santo & Co.	11,209 0 0
Farr	11,143 0 0
Parkington & Son, Ipswich (*accepted*)	11,120 0 0

BRISTOL.

For the erection of a mortuary at the Eastville Workhouse.

Preece	£425 0 0
Williams & Sons	398 10 0
Woodward	390 0 0
Browning	385 0 0
Tanner & Son	327 0 0
Hunt	315 0 0
Lovell	299 0 0
Bray	284 0 0
Harvey, Bedminster (*accepted*)	271 10 0

EPSOM.

For carrying out the sludge disposal scheme with local labour.

Hyde & Co.	£5,822 0 0
Riley	5,627 14 11
Cropley Bros.	4,974 0 0
Kavanagh & Co.	4,795 0 0
Muirhead (*open tender only*)	4,700 0 0
Osenton (*open tender only*)	4,640 11 7
Brebner & Co.	4,638 0 0
Bell & Sons	4,497 0 0
Roll & Taylor, Epsom (*accepted*)	4,383 0 0
Ewart	4,353 0 0
Wort & Way	4,310 14 10
Osman	4,298 0 0

FLEXFORD.

For building a ferro-concrete bridge over the stream at Flexford, near Lymington, between the parishes of Sway and Hordle. Mr. S. Crittall, surveyor, Sway.

Yorkshire Hennebique Construction Co.	£200 0 0
Grace	175 0 0
Smith & Co.	161 10 0
Britton & Son, Brockenhurst (*accepted*)	122 0 0
Tryhorn	120 0 0

HAILSHAM (SUSSEX).

For conversion of the Brewer's Arms into a motor garage. Mr. Arthur H. Burtenshaw, architect, Eastbourne.

Phillips	£285 10 0
Rich	264 10 0
Cornford	254 0 0




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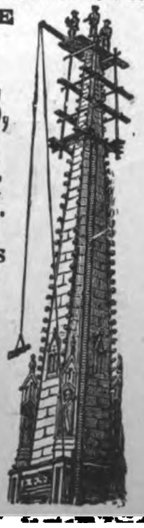
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HANDSWORTH (BIRMINGHAM).

For repairs to Victoria Park house roof. Mr. H. RICHARDSON, C.E., surveyor.

Littler	£295 12 6
Walton Bros.	245 0 0
Webb	219 0 0
Smith Bros.	210 0 0
Garfield	194 0 0
Hulbert & Ladbury	193 13 0
Bishop	187 0 0
Maddocks & Walford	185 0 0
Waterman, jun.	184 10 0
Cox, Handsworth (*accepted*)	167 0 0
Hassall	165 0 0
Surveyor's estimate	192 10 0

LONDON.

For making up the extension of Oxford Gardens as a "new street," for the Kensington Royal Borough Council.

Shepherd & Sons	£1,532 7 4
Wimpey & Co.	1,335 0 0
Mears	1,350 0 0
Rogers & Co.	1,323 0 0
Griffiths & Co.	1,299 0 0
Mowlem & Co.	1,229 0 0
Daley & Son	1,151 10 0
Latter (*recommended*)	1,123 2 4

For renovations and sanitary work at St. Padarn's Welsh church, Gloucester Road, Holloway, N. Mr. G. H. LUETCHFORD, architect and surveyor, 122 London Wall, and 16 Beaumont Road.

King	£1,035 3 0
Ashby Bros.	970 0 0
Bates Bros.	965 7 6
Roberts	935 0 0
RHYS & DAVIES (*accepted*)	892 10 0
Architect's estimate	997 14 0

LONDON—*continued.*

For the removal and re-erection of certain engines, fittings, &c., in connection with the extension of the London County Council Paddington technical institute.

Strode & Co.	£367 0 0
J. & F. May	348 10 0
G. & E. Bradley	309 10 0
Dean & Beal, 1 Arthur Street East (*recommended*)	287 10 0

NARBOROUGH (LEICESTER).

For the construction of about 1,000 lineal yards of 9 inch and 350 lineal yards of 6 inch stoneware pipe sewers, together with the necessary manholes, &c., for the Blaby Rural District Council.

Law	£848 0 0
Wright & Co.	834 18 3
Wickstead & Co.	737 4 2
Hutchinson & Son	725 0 0
Southam & Son	699 0 0
Dix & Co.	695 0 0
Palmer	689 2 0
Webster	689 0 0
BUCKLEY, Bradford (*accepted*)	679 13 9
Stimpson & Rollston	679 0 0
Macdonald	595 0 0

ROMFORD.

For erection of iron buildings as cells for stonebreaking, for the Board of Guardians.

Murphy & Co.	£530 0 0
H. & S. Jones	317 10 0
Haward Bros.	315 0 0
Smith & Co.	312 10 0
Wilmer & Son	300 0 0
Wood Bros.	255 10 0
Whitford & Co.	213 0 0
General Iron Foundry Co.	212 0 0
Norton Bros.	211 0 0
Pierson & Co.	198 0 0
Savill	175 0 0
ALNWICK FOUNDRY AND ENGINEERING CO., 52 Queen Victoria Street (*accepted*)	165 10 0

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WOLSTANTON.

For erecting a residence. Mr. REGINALD T. LONGDEN, architect, Market Place, Burslem, and Leek.

Broadhurst & Son	£1,125 0 0
Grant & Sons	1,100 0 0
Wardle	1,073 10 0
Sambrook	1,060 0 0
Cooke	1,024 0 0
Wilton	983 0 0
Thomas & Sons	963 0 0
Cooke, Wolstanton (*recommended*)	960 0 0
Cummings	896 0 0

WALES.

For erection of a higher standard mixed school for 160 scholars, at Miskin, Mountain Ash. Mr. W. H. WILLIAMS, architect, Mountain Ash.

Maggs & Co.	£5,169 12 0
Howells	4,908 6 6
John	4,583 3 4
Knox & Wells	4,545 0 0
Shail	4,508 0 0
Evans	4,430 15 8
Davies & Sons	4,370 0 0
JONES BROS., Quaker's Yard (*accepted*)	4,260 0 0
Davies	4,200 0 0

For erecting a Wesleyan chapel at Barry Dock. Mr. H. BUDGEN, F.R.I.B.A., Cardiff.

Morgan & Co.	£5,176 0 0
Evans	5,093 0 0
Thomas & Co.	5,063 0 0
Bevan	5,055 0 0
Beames	4,994 0 0
Morgan	4,973 0 0
D. Davies & Sons	4,950 0 0
Britton	4,781 0 0
D. W. Davies & Howell	4,600 0 0
Rendell	4,432 8 8
LLOYD & TAPE, Barry Dock (*accepted*)	4,393 11 6

WALES—*continued.*

For erection of a chapel and school-room, &c., at the Rhosesmor Welsh C.M. Church, Holywell. Messrs. R. OWEN & SON, architects, Liverpool.

Hayes	£3,490 0 0
Sibeon Bros.	3,333 0 0
Lloyd	2,700 0 0
Williams	2,371 9 3
Jones & Sons	2,100 0 0
ROGERS, Flint (*accepted*)	1,770 0 0

TRADE NOTES.

MESSRS. HUDSON & KEARNS have sent us specimens of their registered date indicating blotting pads for 1910, which as usual are excellent and conveniently arranged, but unfortunately most architects receive gratis more blotting pads than they want from manufacturing firms, who put their own names prominently forward. Those architects who do not care to be continually reminded in this way may escape the infliction by buying from Messrs. Hudson & Kearns.

LAST week a test was carried out at the Royal Palace Hotel and Empress Rooms, Kensington, with a new fire protective installation which has recently been fitted up by Merryweather & Sons, in connection with the Hydraulic Power Company's main. The main carries water at a pressure of 750 lbs. to the square inch, and a special hydraulic hydrant is provided by means of which the pressure at the discharging nozzle is reduced to a suitable pressure for fire extinguishing purposes, such as can be readily withstood by ordinary canvas hose. Ten of these hydrants are provided on the various floors of the building, each fitted with 120 feet of canvas hose and nozzle, enabling a fire to be promptly attacked at any point where it may break out. A jet was brought into play on the roof, which is over 100 feet from the ground, and it was found that the pressure was ample for fire extinguishing purposes. Of course, at such a height as this, the pressure from the ordinary water supply mains would be quite inadequate. A special feature of the hydraulic hydrants is that they are each fitted with a relief valve, so that in the event of the hose becoming kinked or twisted this valve automatically operates and prevents a burst hose resulting.

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VARIETIES.

Mr. W. E. Mills, A.R.I.B.A., Oxford, has prepared plans for the reconstruction of the east wing of the Oxford Union Society's premises.

The Limerick County Council have decided on the construction of a bridge over the Shannon at Castleconnell at a cost of 12,000*l*.

The Gravesend Town Council are going to erect an open-air swimming bath in the Gordon Recreation Ground. The outlay will be about 2,000*l*.

The Vulcan Match Company, of Sweden, have purchased from the Barking Town Council a site for a factory. The ground has an area of about seven acres and was purchased for 3,850*l*.

At the Crystal Palace there is to be seen the largest and finest asphalte roller skating surface in the world. After considerable redecorating and refurnishing the rink was re-opened on Wednesday for the tenth season.

Major Stewart, an inspector of the Local Government Board, held an inquiry at Radcliffe recently into an application by the district council for sanction to borrow 13,000*l*. for the provision of new municipal offices. The application was strongly opposed.

An Eastern district committee has now been formed to the Institution of Municipal Engineers. Mr. J. H. Webb, borough surveyor, of King's Lynn, has been elected chairman, and Mr. R. G. Coates, district surveyor to the Norfolk County Council, secretary to the district.

The Maumbury Rings Excavation Committee contemplate carrying out next autumn the third, and probably the final, series of excavations in order to clear up points in connection with the Roman use of the amphitheatre. It is expected that the third period of digging will be of longer duration than the two preceding.

The Local Government Board have informed the York City Council of their general approval of a scheme of sewerage and sewage disposal into which an inquiry was held recently, relative to the application for a loan of 57,658*l*. A revised scheme showing suggested modifications with estimates is to be prepared for the Board.

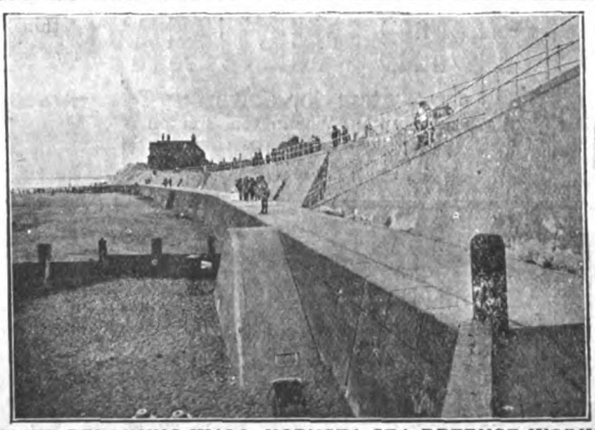
The Edinburgh Dean of Guild Court last week passed the plans for a cattle mart at Gorgie for Oliver & Son, Ltd., which will cover an acre and a quarter of ground. The building, which will be in one block, will be of brick, and will be roofed in in four spans. The cost is expected to be 12,000*l*. Messrs. Cooper & Taylor, architects, Edinburgh, have prepared the plans.

The Dublin Corporation have received sanction from the Local Government Board for the following loans:—(1) 10,000*l*. for advances under the Small Dwellings Acquisition Act; (2) 3,000*l*. for completion of refuse destructor, and reclaiming Fairview Slobland; (3) 75,000*l*. for extension of electric light mains and plant; (4) 1,320*l*. for lighting of North Circular Road and Drumcondra.

Mr. P. C. Cowan, M.Inst.C.E., chief engineering inspector to the Local Government Board for Ireland, opened an inquiry last week at Belfast into an application by the Belfast Corporation for the sanction of the Board to a loan of 30,000*l*. for the purpose of erecting a public abattoir. In July 1899, the loan of 30,000*l*. was sanctioned, but the borrowing of the sum was not effected by the Corporation, who have submitted different plans. The Board consequently decided to hold a further inquiry.

The Incorporated Society for Promoting the Enlargement, Building and Repairing of Churches and Chapels announce that the grants voted at their meeting last week have practically exhausted their funds. During the past ninety-one years 9,236 places, *i.e.* more than half the parishes in England and Wales, have been aided by the society with grants from the General Fund amounting to 1,068,110*l*., and 995 grants have been made from the Mission Buildings Fund amounting to 26,724*l*.

The Corporation of Aberdeen have given formal intimation of their intention to apply to Parliament in the ensuing session for power to take a water supply from the river Avon, Banffshire, by means of forming an impounding reservoir on the river at that point. It is proposed to convey the water by pipes through the parishes of Kirkmichael, in Banffshire, and Strathdon and other parishes in Aberdeenshire, to a reservoir at Wardhead, about three miles west of the city. From Wardhead the water would be distributed to the existing reservoirs at Pitfodels, Slopefield, and Mannofield. The

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length of the aqueduct is fifty-two miles, and the supply contemplated is ten million gallons per day. The works, it is expected, will occupy about ten years, and the cost is estimated at 1,068,000*l.*

THE Finance and Leases Committee of the Dublin Corporation have issued a report recommending the erection of new municipal buildings for the accommodation of officials. It is proposed that the new offices shall be built in Lord Edward Street on a site already the municipal property. This would give a frontage of 294 feet, with two return blocks, running back to Castle Street. The Committee also state that a third return building could be erected, if required, for an art gallery. It is proposed that the buildings shall be three storeys in height. The estimated cost is between 40,000*l.* and 50,000*l.* The existing City Hall would be retained.

THE Local Government Board have written to the Dublin Corporation relative to an inquiry held into their application for a loan of 100,000*l.* to complete the main drainage of the city. The Board subject the application to considerable criticism. They point out that a resolution of the Council, passed on November 6 of last year, binding contractors only to employ men who had a minimum residence of two years in Dublin is "an unnecessary and unwise addition to the existing restrictions on the freedom of contractors for Corporation work." They further state that the prices estimated for the work in this case are too high, and they disapprove of the work being done by direct labour—it being, in their opinion, most desirable for all parties concerned that "the work should be put up for competitive tenders from competent and solvent contractors." Until these objections are satisfactorily disposed of, the question of sanctioning the loan will not be considered.

THE CRYSTAL PALACE SCHOOL OF ART.

MR. MATTHEW WEBB'S lectures have become quite a popular feature, and he has chosen for his subject "The History of Art from Prehistoric to Present Time." He will deliver the fourth of a series on Tuesday next, November 30, in the hall of the Crystal Palace School of Art, at 5.30, when he will deal principally with the struggle between Saracenic and Christian art, especially exhibited in Spain. These lectures are made the more interesting by some splendid limelight illustrations. In the course of a recent lecture Mr. Matthew Webb reminded his hearers that in the Egyptian Court at that institution the details of all kinds of Egyptian art were very faithfully copied from remains in Egypt. He thought it was very much to be regretted that there were no notices descriptive of the courts themselves and their contents appended somewhere within easy view of the general public, and if it should ever be determined to pull them down it would be absolutely lamentable, for nowhere else in the United Kingdom, or indeed anywhere, was there such an unique display of Egyptian art as in the Crystal Palace Court.

THE ILLUMINATING ENGINEERING SOCIETY.

THE inaugural meeting of the first session of the Illuminating Engineering Society was held in the hall of the Royal Society of Arts, Professor Silvanus P. Thompson, President, in the chair.

The Hon. Secretary, Mr. Leon Gaster, in reading the report of the Council, stated that within the last few years there has been a great development in methods of illumination, and there is now at the disposal of the consumer a bewildering variety of illuminants. At the same time, changed industrial conditions have led to the use of much more light, and taxing the eyes by the injudicious placing of powerful lights, &c., to a much greater extent than a few generations ago.

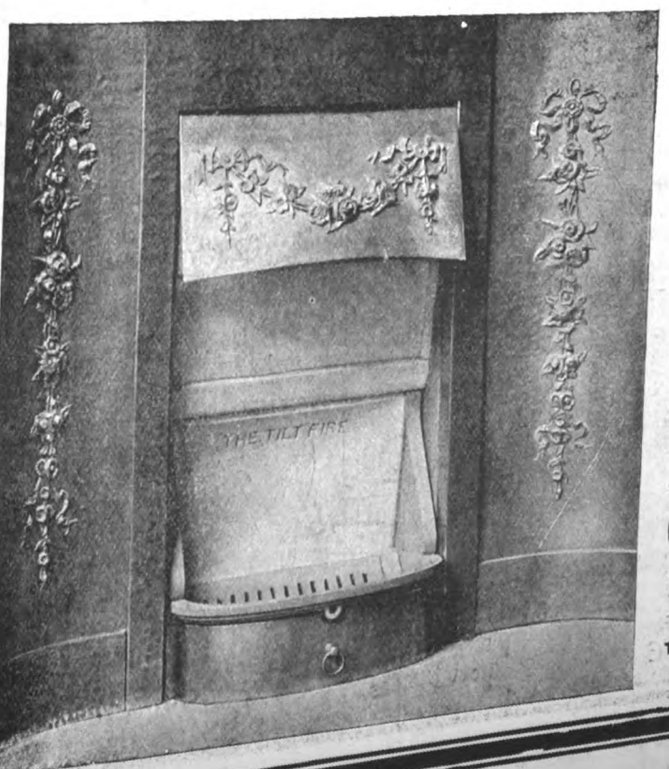
This led to a strong sense of the value of a Society capable of dealing impartially with the problems of illumination. The successful career of the Illuminating Engineering Society in the United States, which has been in existence for several years, strengthened the view that an organisation with similar aims, in Europe, might do very useful work.

The Illuminating Engineering Society in this country dates from February 9, when an informal dinner was attended by a number of gentlemen, representing various trades and professions, who were interested in its formation.

On that occasion the Hon. Secretary, Mr. L. Gaster, briefly summarised the steps in the progress of the movement.

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In 1906 he had invited those interested to co-operate with him in order to found such a society, and a number of gentlemen then came forward. Subsequently, however, he felt that the time was not quite ripe for the initiation of a truly representative body, and in 1907 he paid a visit to the United States and learnt the experiences of nearly all those who had been instrumental in promoting the Society having similar aims. Subsequently he visited the Continent with the object of interesting the best known authorities in lighting in the movement. There, as in the United States, the idea met with enthusiastic approval, many of those who promised their support also consenting to act as contributors to the journal.

It was felt to be necessary to devote some time to bringing home the need for the Illuminating Engineering Society and to educating the public to its aims and aspirations. The hope was expressed, and has been amply justified, that the journal would be the means of illustrating clearly the nature of the work which the Society would be called upon to perform ; also that it would act as a means of collecting together all those interested who would afterwards form the nucleus of the Society.

During this time it was noticeable that more attention came to be devoted to matters connected with illumination in the technical press, and the attitude in many quarters towards the movement became increasingly favourable as its nature became more fully understood.

It was next arranged that the *Illuminating Engineer*, of which Mr. Gaster was editor, should become the official organ in order that the Society might be able to profit by its existing connection and reputation, and so practically escape the expense involved in publishing transactions.

It was felt that, with the opening of 1909, the time was ripe for active steps to be taken in forming a Society. The general feeling of those present at the dinner referred to was strongly in favour of starting without further delay, and a committee, representative as far as possible of the various professions and trades interested, was appointed to consider the framing of statutes, &c.

At a meeting of the supporters held at St. Bride Foundation Institute, London, on May 25, the draft constitution was passed subject to certain modifications of detail such as legal considerations might suggest.

The existing committee was also reappointed with power to add to its number, and thereby form the nucleus of the Council of the Illuminating Engineering Society. The Council, although very representative, does not as yet contain the maximum complement of members, it having been thought advisable to leave some vacancies to be filled up as occasion might demand.

The Council next proceeded to consider the question of election of a president, and are happy to report that Professor Silvanus Thompson, D.Sc., F.R.S., has consented to act as president ; the Society considers itself singularly fortunate in possessing as first president one who has devoted so much attention to the scientific aspects of illumination, and has taken a great deal of interest in all methods of lighting.

In addition the Council have approached a number of authorities in different countries with a view to their becoming vice-presidents. Here again they have secured exceptionally influential and international support. The Society starts with a membership of over 164.

In order to secure additional representation, special provision has also been made in the statutes for the inclusion of corresponding members, who are willing to aid from time to time by their advice on local questions, or in connection with aspects of illuminating engineering on which they are recognised authorities. The Society has already been able to secure corresponding members in many of the chief Continental and American cities, and hopes to extend the list still further.

A few words may be said as to the aims, objects, and aspirations of the Society.

In the first place the main object is simply to provide an impartial platform where questions connected with illumination may be discussed. Owing to the absence of such a platform there has been a tendency for misleading or one-sided statements to be circulated and there are many questions on which authoritative information is badly needed. It is therefore desirable to provide a common meeting ground, not only for engineers connected with different systems of lighting, but also for members of the medical, architectural and other interested professions ; through the free exchange of views thus brought about it is hoped that not only will those connected at present with some particular aspect of illumination learn from one another, but that eventually a certain number of experts fully qualified to take a wide and impartial



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ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 24 MR. ARTHUR C. BLOMFIELD, M.A., F.R.I.B.A.

NO. 25, MR. PAUL OGDEN, F.R.I.B.A.

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view of the whole problem will be evolved. The ideal expert of this kind has been called "The Illuminating Engineer," and there are doubtless many matters of public importance, such as street lighting and the illumination of schools, hospitals, libraries, museums and other important public buildings in which his services would be invaluable.

But for the present the career of the Society will be largely one of mutual education and the spreading of knowledge among the general public. It is therefore hoped that the Society will be instrumental in raising the standard of knowledge of illumination among those who, in one capacity or another, are at present engaged in problems of lighting. Membership in the Society does not by itself qualify anyone to be recognised as an "illuminating engineer."

The ground to be covered by papers is naturally extremely wide, and there are many points of common interest to those connected with all illuminants. The Illuminating Engineering Society, having expressly framed its Constitution with a view to impartiality, can justly claim to be in a position to deal with problems in which the spheres of influence of the different illuminants are concerned in a manner in which no other society can do. Under these conditions the claims put forward by representatives of one or other illuminant will be examined impartially and the possibility of misunderstandings or onesided discussions reduced to a minimum.

In reality, the ground which it is desirable to cover in a session is almost too wide to be treated in the course of the meetings available. It is hoped, however, that the Society will be able to cover additional ground in the future by organising courses of lectures to deal with elementary matters, or with detailed questions which appeal to experts of a certain class, but are not such as would be suitable for prolonged discussion at a general meeting.

The Society also hopes to be instrumental in organising Congresses for the discussion of points of special consequence and exhibitions of the most recent developments in lighting and photometrical and measuring apparatus.

In addition, it is hoped eventually to be in a position to accumulate information and to deal with technical points by means of committees of specialists. In such cases, it is suggested, the international connection of the Society will be specially valuable, as it will enable the Society to be in touch with experts in all parts of the world, and, if necessary, to organise series of researches in different countries on a common and predetermined course of action. It is also anticipated that the international connection of the Society will enable it to be specially instrumental in dealing with points of international importance, such as questions connected with units, nomenclature, standardised conditions of testing, &c. At present owing to the difference in the conditions under which researches in various countries are carried out, often the results obtained are not intercomparable.

WALL DECORATION.

It is generally agreed that within the past decade there has been a marked advance in the standard of taste exhibited in house decoration. Some thirty years ago there appeared to be a cult of ugliness abroad in this country which overwhelmed all the excellences that had been bequeathed by preceding periods. Happily this was only a transient phase; perhaps even it served a good purpose in so far as by force of contrast it emphasised both the beautiful and the ugly. There is difference of opinion as to who is deserving of the credit for the gradual abandonment of Victorian ideas for freer and truer guiding principles. Some hold that the public themselves led the way out of the dark and dreary by-ways down

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which they had strayed; others give the credit to professional and self-appointed teachers; while others, a comparatively few others certainly, tender their gratitude to the business firms who provide for the decoration of our homes. Perhaps honour should be rendered to all three—to the public which grew dissatisfied with artifice and dreariness; to the teachers who fostered if not inspired that discontent; and, lastly, to the tradesmen who were quick to seize the opportunity for abandoning the models and modes of the past and for meeting demands that had scarcely yet crystallised. It is indisputable that the big wholesale and retail firms have played and are playing a prominent rôle in this reawakening. It is their business to divine the impending wants of their customers, and it is their privilege to subtly influence that demand. Sometimes this may be abused, but more often the responsibility is gravely undertaken and the results are seen in that general improvement which is to be witnessed on every side.

The starting point is the decoration of the room itself—that is to say, of its walls, the ceiling, and the floor. Here there is an extensive and rather bewildering choice. So far as walls are concerned a visit to the showrooms of the Wall-paper Manufacturers, Ltd., at 1 Newman Street, Oxford Street, W., will show one very excellent way that is to be put on sale at the beginning of 1910. The showrooms have just been redecorated and show the latest designs in Lincrusta-Walton, Cordelova, and Caméoid self-decorations. The ceilings and friezes are covered with these two latter substances which are particularly conspicuous both for their designs and for the fact that they are readily cut to fit in the most awkwark shape without loss of effect. But these materials are familiar to architects. What is shown for the first time is "Metaxin." This is a wall-paper with a surface of artificial silk, but which contains no metallic bronzes (and consequently is permanent in colour), is washable and is germ-proof. It is to be made in fifteen colourings and sixteen patterns; of these a few are already in the showrooms, and the purchasers may choose between effects on satin, brocade, watered silk, &c., and tints of old gold, rose red, green, white, gold, plum red, and so on. The paper is, of course, a superior one, but the manufacturers say that it is the cheapest high-class wall paper obtainable. It has, moreover, the no small recommendation that it is made in this country, and not, like most of its rivals, abroad.

LONDON MASTER BUILDERS' ASSOCIATION.

THE ordinary monthly Council meeting of the L.M.B.A. was held on Thursday, the 18th inst., when the President (Mr. F. G. Rice) occupied the chair. The meeting was of a lengthy and discursive character, and was protracted till quite a late hour.

The question of a builder who is appealing against the decision of an arbitrator was considered. The opinion of counsel was read, and certain course of action decided upon.

On the report of the proceedings of the organisation committee a long discussion took place as to the eligibility of sub-contractors for associate membership, the same firm frequently trading both as builders' merchants and as sub-contractors specified by architects, and therefore exposed to the same attacks as the master builder himself. Under such circumstances it was considered hardly fair for the builder to have to do all the fighting in the event of a trade dispute while the sub-contractor could stand aloof and even extend his operations. It was proposed by some that those who are likely to compete with the builder should give an undertaking to take the same chance as he does, and support him in case of need. It is well known how much disorganisation is caused by some sub-contractors. They treat the builder as of no account, use his plant, and, indeed, ride rough shod over him while the enduring builder has to bear all his annoyances without satisfaction to his general operations, and with little or no profit.

After remarks by Messrs. F. Higgs, J. Carmichael, Wr. Lawrence, jun., Ernest J. Brown, W. F. Wallis, Frank May, Col. G. Haward Trollope, F. L. Dove, it was agreed by the Council that those firms who are specified by architects to carry out work usually done by the building contractor be considered sub-contractors.

One firm was elected as ordinary member, Messrs. R. Woollaston & Co., Limehouse; sixty-eight associate members were elected.

The President produced his draft of the addition to the history of the Association, to be given in the 1910 "Diary and Handbook," and the Council approved it.

The question of a trade paper being issued free to every ordinary member of the Association was considered, and referred to the finance committee for consideration and report.

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THE DISPOSAL OF SEWAGE AT A COUNTRY HOUSE.*

THE laws of sanitation are as old as the Decalogue. Moses made rules and regulations for the guidance of the Jews, both as regarded their persons and their dwellings. Nor were the Romans blind to the virtues of sanitary methods, and to this day may be seen remnants of their work; for example, the Cloaca Maxima and various drainage arrangements of famous Roman villas are still extant, but it has been left to the English nation to bring sanitation to its present state of perfection. As a nation we are thoroughly practical, and the waste of life and power implied by a high death-rate has induced us to take steps to remedy conditions capable of being remedied. It sometimes happens, however, that the first remedial step is a miscalculation and produces temporary dislocation of sound plans. For instance, when the water closet was first introduced there were no sewers, and although the system of water carriage was good in itself (it was in fact the foundation of the cleanliness which exists to-day, and without which no great city could prosper), yet it was upon the introduction of the water closet that the cess-pool with all its dangers to health became a common necessity, and in the early part of the century these cess-pools were to be found in the most unexpected places. There are evidences in some of the old London houses to-day of cess-pools having been constructed in the basement of the houses and even under the kitchen floors. When those cess-pools were filled others were constructed, and in their turn they became a nuisance and a danger to health. Altogether the last condition became worse than the first.

In the twentieth century it is quite unnecessary to show that an insanitary condition is productive of disease. At the same time the cost of sanitary work is so great that it serves a good purpose to recall on occasion one or two historical facts. For example, Dr. Laycock, in giving evidence before the Town Commission in the middle of the last century, stated that in the city of York in 1664, when the plague broke out, the proportion of deaths was one to three living, whilst in 1832, after several salutary and costly lessons when cholera broke out in the same city, the proportion was very different—namely, one death to 142 persons—but even then the condition of things was very bad, as a document which Laycock found in the city archives proved. There were wide stagnant moats, the streets were narrow and filthy, the only drainage was to be found in open channels in the streets, and altogether the condition was very far from what we speak of as a hygienic state of affairs. Such a condition of things is hardly credible in the present day.

We know that the death-rate in England bears most favourable comparison with the death-rate in other countries, but within the past few years rapid strides have been made by every country in the direction of improved sanitation. There is hardly a country in Europe that has not made vast improvements, and visitors from every corner of the globe visit the chief towns in England to ascertain what works are being carried out to promote the health of the community, and of chief interest to those visitors are the methods of disposing of sewage. I have had the pleasure of conducting representatives from almost every country in Europe and every colony of the British Empire over the works which the Birmingham Drainage Board have constructed in the valley of the Tame. The reason for our lead in this respect is very accurately and succinctly stated by Mr. Whipple, of New York, in his report on a visit to Europe:—

"England has taken the lead in these matters, and it is there that one must go to find the latest developments in the art of sewage disposal. If one asks the reason for this, a fitting reply is found in the old adage that 'Necessity is the mother of invention.' The English rivers are small, the English cities are large and numerous, and the amount of manufacture carried on in them is very great; consequently the streams are badly polluted, and the need of sewage purification works is pressing. Furthermore, the soil of the country is not well suited for land treatment of sewage, and in consequence the English engineers have been forced to adopt other methods. This has stimulated their ingenuity and given rise to many modifications of chemical and bacterial processes. In England, therefore, one can see more and learn more of sewage disposal at the present time than anywhere else in the world."

* A paper read before the Institute of Sanitary Engineers at Birmingham on November 16, by John D. Watson, M.Inst.,C.E., President of the Birmingham and Midland section of the Institute of Sanitary Engineers.

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Nor does this testimonial from the New World stand by itself. The New York *Municipal Journal and Engineer* in 1906 began an article on the disposal of refuse by saying:—

"It is admitted by all engineers that England is at least fifty years in advance of this country both in the collection and disposal of its garbage and refuse."

It may be taken for granted that municipal authorities in England, as representatives of their respective cities, have recognised their responsibility in promoting healthy conditions, and since the adoption of the County Councils Act, 1888, the same might be said of county authorities. In England our progress is generally the result of pressure from the intelligent public, not coercion on the part of the wise minority, as in some other countries, but the public, having seen and understood the advantages accruing from improved sanitary conditions, are unwilling to forego or minimise them, and they have brought pressure to bear upon the Legislature along lines advocated by such institutions as the Royal Sanitary Institute and the Institute of Sanitary Engineers.

Since 1888 County Councils and their officers have done noble service for the rural districts, villages, &c., and although a great deal remains to be done, the fruits of their skilful, zealous and unselfish labours are becoming evident in the healthier dwellings and surroundings of the labouring classes. There is still much work to do, some of it in a direction which is not easily reached by officials.

There are mansions and homesteads which are far from being healthy, although charmingly situated on high land and surrounded by sylvan beauties. There are many mansions drained into beautiful streams which form the sources of water supply to thousands of people lower down, and no attempt at purification of the sewage is made. There are streams which may not be characterised as pure, flowing past great houses which add their quota of impure liquid. The owners of such houses grumble about the condition of the streams and recall the good old days when fish were plentiful, but they do nothing to render the sewage from their own properties free of impurity before it joins a stream. How are we to remedy such defects? First, by making the owners and occupiers realise the need for improvement; and, second, by adopting an efficient method of effecting it. This Institution concerns itself with the latter, and for this evening I propose to direct your attention to that section of the work which deals with freeing the sewage from its noxious ingredients before it is allowed to flow into a stream.

Assume, therefore, that everything inside the house is all that can be desired, and that the question is how to get rid of the sewage without infringing the statute and without being liable in damages at common law. Assume also that there is no wish to evade the Rivers Pollution Prevention Act, 1876, which enjoins that the best practicable and available means should be taken to purify the sewage before discharging it into the stream, and we are face to face with the question, What is best to be done? In determining this the following information is required, and should be obtained by the engineer to enable him to recommend a particular scheme of purification:--

1. The chemical composition of the sewage to be treated.
2. The population to be provided for, existing and prospective.
3. Whether the drainage includes roof water; whether, in fact, it is on the combined or separate system.
4. The amount of water supply.
5. The variation of flow to be dealt with.
6. The disposition of the available site, difference of elevation between the outfall drain and the stream into which the effluent is to be discharged.
7. The relative volumes of effluent and stream.

Each case should enfold its own needs, and the more exhaustively the circumstances are inquired into during the preliminary stages, the more likely is the scheme to give permanent satisfaction.

I attach much importance to ascertaining exactly the nature and composition of the sewage to be dealt with. I have known purely domestic sewage so concentrated that it had to pass through two percolation beds one after the other before it was made fit to enter an adjacent pond.

Had this not been known before the work was started and the plans prepared, the ultimate results would have given rise to much disappointment and the scheme would have been dubbed a failure.

For many years engineers and chemists were content with a good deal less than purification, and at various times during the latter half of the nineteenth century 454 patents were taken out to purify sewage by chemicals, but none of these was effectual. Chemicals are capable of retarding decom-

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position, and this may be enough when the effluent is discharged into a great river. They may precipitate solids and reduce colloidal matter. They may help to keep down foul smell. They may even help to promote nitrification, but they cannot effect the change which is essential to insure a stable non-putrefactive effluent. Sewage purification, as, indeed, purification of every impurity, is the special function of the friendly microbe. Without the aid of the micro-organisms it would be impossible to convert or transform organic substances into their inorganic elements. To effect a permanent beneficial change in the composition of sewage it is necessary, therefore, to employ a natural method. It may be done by what the Royal Commission on Sewage Disposal called natural means—that is to say, by land irrigation; or it may be done by artificial means, or bacteria beds; but the choice depends very largely on local circumstances and considerations. The former method requires a greater area, and the latter requires a fall of at least 6 feet between the inlet and the outlet sewers.

I have said enough to show that each case must be considered on its own merits, but assuming a typical case of a country house—

1. Inhabited by ten people.
2. With sewage of average strength.
3. With a total volume of sewage to be treated equal to 30 gallons per person per day.
4. A varying flow fluctuating from nil during the night to a rate equal to a flow of 1,200 gallons per day during the forenoon of an ordinary day.
5. The relative amount of effluent to the water in the stream not more than one to five.
6. The levels suitable to admit of a difference between the affluent and the effluent pipes of, say, 8 feet.
7. The area of land adjacent to the house of average quality and about one acre in area.

Given such conditions I would recommend the establishment of a bacterial plant on the percolation system, consisting of:—

1. A septic or sedimentation tank.
2. A percolation bed.
3. A small sand filter, or other suitable means of removing the humus from the bacteria bed effluent.

The tank is a very important part of the plant. Its main purpose is to digest suspended solids, and so prepare the sewage for distribution over the bacteria bed. It also equalises the flow to the bacteria bed. It is obvious that more sewage flows to the tank at certain times of the day than at other times, and it is desirable to provide sufficient capacity to retain the maximum flow which occurs during the forenoon until the minimum flow which frequently ceases altogether during the night. The tank, therefore, should be constructed so as to provide as far as possible an equal flow to the beds during night and day. It serves still another purpose which has been lost sight of sometimes—namely, that it is the amount of impurity, not the volume of liquid, that counts in the purification process. Domestic sewage is potable water holding in suspension and solution ingredients which do not belong to it as water, and it is evident that at certain times these ingredients predominate in the water to such a degree that an ordinary bacteria bed could not cope with the burden imposed upon it unless the strength of the sewage were proportionate to the purifying power of the bed. The tank, therefore, serves the purpose of equalising the quality as well as the quantity. It acts as a mixing tank and tends to produce a consistent effluent for distribution over the bacteria bed.

The form of a septic or sedimentation tank must depend on circumstances, but for a small tank such as the one under consideration, an oblong form, length about twice its width, and depth from 4 to 6 feet sloping towards one end, will be found the most convenient. It should be watertight and covered by a close-fitting movable cover, and if the levels admit it should have a draw-off pipe at the bottom to facilitate removal of sludge. The settled or septicised sewage should be drawn off at a level that admits of the upper portion of the tank being used to impound the surplus or maximum flow until later in the day, when the flow is greatly reduced. If the installation is large enough to warrant the use of what is called a floating arm, this is easily done; if not, an arrangement for contracting the mouth of the outflow pipe will have to suffice.

The tank I have described may be used either as a sedimentation tank or a septic tank, and the uses I have enumerated are applicable to both. If the sewage is septicised additional advantages obtain in respect of the diminished quantity of sludge to be dealt with, and the tendency which septic fermentation has to kill pathogenic organisms. A disadvantage

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of septicising, however, is the foul smell of the tank liquor as it is spread over the bacteria bed.

It is difficult to give an intelligible description of what goes on in a septic tank. In the first place, our knowledge is by no means complete; and in the second place, there exists among bacteriologists difference of opinion; but I think I may safely say that there is a great variety of species among bacteria, and that they have different functions to perform according to their kind. One kind of organism attacks and digests one component in the sewage, and another, another, until the whole of the organic matter in the sewage is peptonised, and what has been, from a chemical point of view, a mixture of complex bodies is transformed into a mixture of much simpler substances. In the process of the transformation gases are evolved, and in rising to the surface of the liquid, as they naturally do, they bring with them matters in suspension, which form a tough gelatinous kind of a scum over the surface of the tank. This scum is more readily formed in a covered tank, where the temperature is more equal and invariably higher than in an open septic tank, but in both cases the process and the changes which take place are as nearly as possible identical. The ebullitions of gas are intermittent, but in a large tank appear to be so continuous that air bubbles are constantly rising to the surface and appear like beads floating on the dark water. Where a scum has been formed the water does not have the appearance described, but in joints and cracks of the crust you can frequently see the formation of air bubbles, and where the air is concentrated in this way it is sometimes possible in an open septic tank to produce a flame by igniting the gas, while from a covered tank gas may be drawn off for illuminating purposes and used as a substitute for ordinary coal gas.

One reason for encouraging septic fermentation at this stage of the purification process is that the breaking down of fatty matter and cellulose, which embraces substances like paper, straw, fibre, &c., is very largely due to the action of the liquefying anærobes. Notwithstanding what appears to be an established fact, one cannot forget that the disappearance of leaves which fall every autumn from deciduous trees must be due to an organism essentially different from one whose habitat is in darkness and absence of air.

The sewage having been prepared for further treatment is led from the septic tank to the bacteria bed, which consists of a heap of stones, or other suitable material, placed so that the tank liquor is allowed to trickle from the surface downwards, thus exposing the drops of impure liquor to the action of microbes occupying the interstices in innumerable numbers, and if the action is sufficiently prolonged the impurities are practically destroyed—that is, converted into carbonic acid, free ammonia, and nitrates.

The form of the bacteria bed is immaterial so far as purification is concerned. The largest installations are rectilinear, but the governing factor in the shape or form is the method of distribution of the sewage, and as the fixed spray-jet is the best for a large installation, the bacteria beds are generally rectangular in form. As the rotary distributor is best for small installations, small beds are generally circular in form. A bed, therefore, to deal with only 300 gallons per day would be less than 5 feet in diameter, provided the medium is 6 feet in depth. The floor should be impervious concrete in situ, floated to a smooth surface preferably. On this floor a false floor, consisting of what are called ærating tiles, should be laid to retain the medium and facilitate the free discharge of effluent. The tile floor also forms a means of æration and the ready dispersion of gases, like carbonic acid gas, which inclines to harbour in the bottom of the bed, but the main advantage of a false floor is to facilitate a free discharge of those solids that accumulate in the bed especially after excessive working. If a bacteria bed has been well built and the medium properly selected, particularly as regards size of the pieces employed, the danger of chokage will be reduced to a minimum.

A percolation bed should be a permanent structure that requires no renewal and no displacement for cleansing purposes, and this can be obtained only by the employment of good rock or other hard substance that will not resolve or become friable by the action of water or atmospheric change; other qualities to be aimed at are roughness of surface and proximity to cubical form.

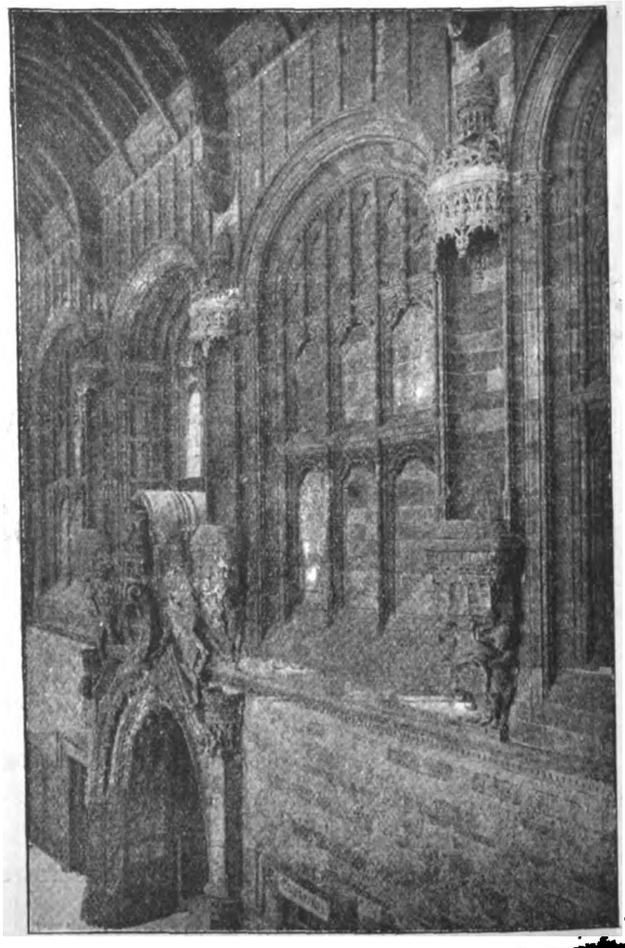
There is nothing better than clean broken stone, but gravel, blue bricks, and hard ball slag, when broken and clean, may be regarded as almost equally permanent. The blue brick tends to break into flat chips in the cracker, and gravel, unless broken, presents too smooth a surface to the bacteria—not that a smooth surface is essentially bad, but it is too sensitive and too readily denuded of the gelatinous substance, harbouring

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the bacteria when the flow is increased by reason of rainfall, to be held in high estimation as a medium.

The sizes to which medium should be broken can be decided only after prolonged and careful tests, and a size suitable for one sewage may be quite unsuitable for another.

It may be safely assumed that the smaller the medium the more complete will be the purification obtained, but a bed composed of small medium ($\frac{1}{8}$ inch) costs much more than medium size (1 inch diameter). Then the small medium will not take so much sewage; it will require longer periods of rest, and it will retain on the surface suspended matter which can be more economically dealt with subsequently.

In all sewage there are impurities that are readily eliminated, as gas. There are also impurities that undergo change with extreme slowness, such as colloidal matter, and recent investigations show that there is reason for believing that it is colloidal matter that causes the notorious loss of capacity of contact beds, and constitutes the bulk of the suspended matter issuing from percolation bacteria beds.

I am convinced that there has been a distinct want of knowledge regarding the real nature of the clogging of contact beds, and the more the subject is investigated, the more will it be seen that the safest form of bacteria bed is one which allows the bed to perform the natural function of discharging the matter which is due to the chemical change that must inevitably take place in a sewage containing colloidal matter. Some prefer to eliminate the solids from the sewage before it is applied to the oxidising bed, even if they have to use chemicals for the purpose, but this is not so obviously wise as would appear at first sight; for example, I have known many beds that gave off as filtrate liquid containing more suspended solids than were contained in the sewage applied to them to the extent of 2 or 3 parts per 100,000. For the sewage under consideration a $1\frac{1}{4}$-inch stone medium would be excellent, and should be the same size from top to bottom.

Those who are inexperienced in sewage purification place too much weight upon the appearance of the effluent. This should be guarded against, as a beautiful clear effluent may putrify on incubation. An opaque-looking effluent, on the other hand, with 10 or 12 parts per 100,000 of suspended solids, might pass such a test easily—a test which after all is the chief one to be complied with.

The primary function of the bacteria bed is to convert the ammonias into nitrates and nitrites; therefore to attempt at the same time by using small medium to keep back suspended matter is only to prepare for further trouble. The solid matter appearing after passage through a coarse-grained filter is comparatively easily removed either by passing it over a small sand filter, or by allowing it to flow quietly in small narrow trenches cut in zig-zag form on its way to the nearest stream.

I hope I have not led you to assume that the only form of oxidising bed which is capable of transforming noxious into innocuous matter is the percolation bed, because what is called the contact bed is quite capable of doing the same work in a different manner. It is not so popular as it was, and the statement of the Royal Commission that a cubic yard of medium in the form of a percolation bed is worth much more than the same measurement in the form of a contact bed, will do a great deal to deter engineers from using that form of bacteria bed in the future, unless perhaps where it is possible to purify by means of one contact (two contacts requiring about the same fall as one percolation bed); but I should imagine that that is so rare an event that it would be remarkable.

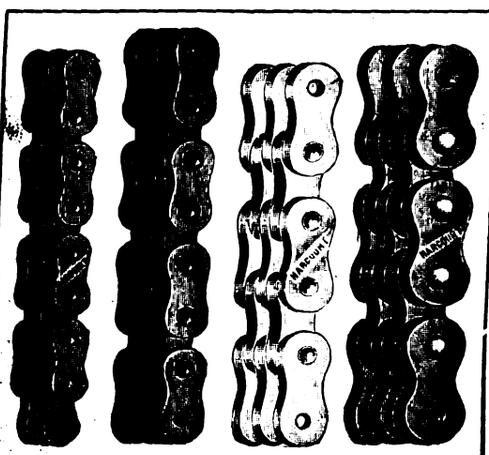
When my predecessor in this chair stated six years ago, in contrasting percolation beds with contact beds, that the latter were dead, he showed his keen insight into the relative merits of the two systems. He was not quite accurate when he said it, as Sheffield and Leicester have since that time adopted the contact form; but expert opinion undoubtedly favours the percolation bed, and it is because I believe it is the form which should be adopted whenever it is practicable that I have confined my remarks to that method of treatment.

There are many situations where a percolation bed could not be brought into use without resort to pumping, which in the vast majority of cases would be prohibitive as regards cost. I propose, therefore, to show that the next best thing to do is to utilise part of the garden as a sub-irrigation plot, but even here it should be borne in mind that unless the land is suitable as regards quality and area and that it can be drained to a depth of 4 feet, it is improbable that effective purification will take place by this method.

The principle involved in adopting irrigation was formerly believed to be absorption of excrementitious matter, &c., by the soil, and utilisation of the same by crops, whilst the

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water freed of its noxious qualities gravitated to the drains. Now we would prefer to say that the action is a complex one; first, the mechanical property of straining slowly through the soil is not an inconsiderable part of the purification process, and the chemical changes that take place, due largely to the biological action of the nitrifying organisms, contribute in an even greater measure to the radical change. The effluent obtained by this process of sub-irrigation, where the conditions are entirely favourable, is excellent, but the difficulty of obtaining favourable conditions is great—so great that land treatment is not so popular as it was. If the land is too porous the liquid passes through unpurified; this is especially so on sandy or gravelly soils overlying rock, and if the available ground is planted with trees the sewage follows the roots and tendrils to the nearest drains, effecting only partial purification. On the other hand, if the soil is stiff like clay, marl or peat, or otherwise too compact and retentive, the water cannot escape readily enough, and the site becomes a swamp. Perhaps the worst cases are where the land is on the chalk or the oolite formations; then there is a tendency for the sewage to disappear too easily by cracks and crevices to some neighbouring well, it may be. But the province of the engineer is to overcome difficulties where they exist, and in the case of a house discharging only 300 gallons of sewage per day, and requiring a plot of land 20 yards by 20 yards, it is possible to overcome even natural disadvantages of site, provided the cost of doing so is not prohibitive. If sub-irrigation is adopted, the tank should be used as a sedimentation rather than a septic tank, and it should be fitted with a syphon or tipper to insure the volume of sewage reaching the extreme limit of the irrigation ground; without one or other of those mechanical appliances the sewage would only reach the extreme end of the pipe-line when baths were being used, thus improperly confining the operation.

The tank liquor should be conveyed to the land selected by close jointed pipes; there should be branches at stated intervals formed of ordinary unjointed land tiles laid about 12 inches from the surface, and the junction boxes should be supplied with stops for regulating the direction of the flow.

In order to insure the tile pipes being relaid in the same position after they receive their periodical cleansing, it is well to lay them, in the first instance, on a narrow bed of concrete slighfly hollowed to keep the tiles in alignment.

It is necessary to drain the subsoil in the majority of cases, and the drain-pipes should not be shallower than 4 feet from the surface. The number and distance apart must depend on the nature of the subsoil, but it is better to put in too few rather than too many drains in the first instance.

The sub-irrigation pipes are intended to be taken up and cleaned annually, as they are only 12 inches under the surface. This is neither difficult nor expensive, but in many cases it will be found unnecessary to disturb them for years.

The construction of a sub-irrigation plant is simple, but it requires in maintenance what is sometimes difficult to obtain —viz., interest in its successful operation. For instance, if the direction of the flow is not changed whenever there is a sign of overdosing at one place, temporary failure is sure to be the result.

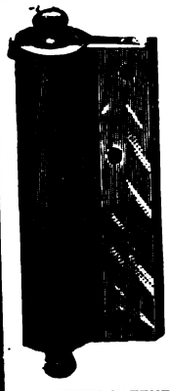
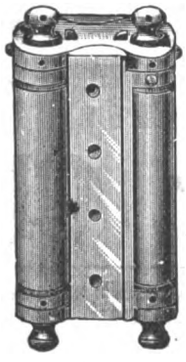
In working this plant it should be remembered that the purification is obtained by the organisms working in the presence of air as in a bacteria bed, and that if air is entirely excluded from the ground by reason of its super-saturation, there will be an immediate drop in the nitric nitrogen contained in the effluent.

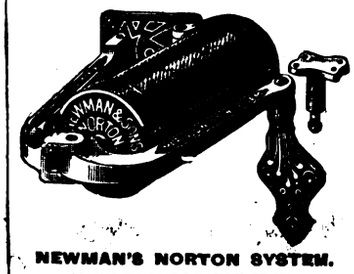
The engineer is placed at a great disadvantage in designing work which he will have no control over when it is completed, and both in his own interest and in that of his clients, he should never fail to leave written directions as to its working. I have known the same plant to give good and bad results depending solely upon whether the gardener took any interest in the plant or not.

One cannot, therefore, emphasise too strongly the unwisdom of multiplying small sewage purification plants, when it is possible at a reasonably increased expense to amalgamate with others in establishing a plant large enough to insure efficient management. At a country house this is generally impossible, so that one must expect there, unfortunately, the maximum of expense with the minimum of benefit. Yet the objects are so desirable that the engineer should promote as far as possible simplicity of design, paucity of mechanical devices, and uncomplicated methods of working. He should not hesitate to express with the utmost frankness that there is no system of sewage purification that will work efficiently unless the man in charge takes some interest in his work.

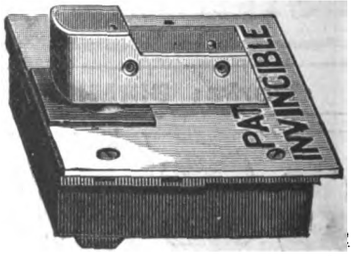
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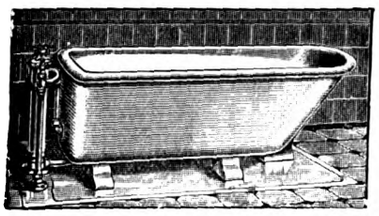
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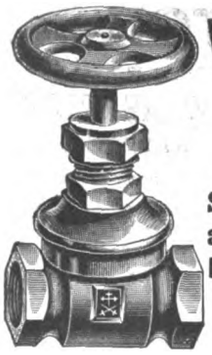
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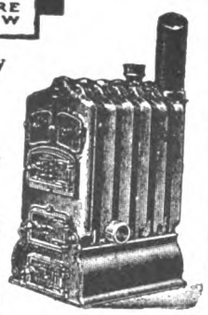
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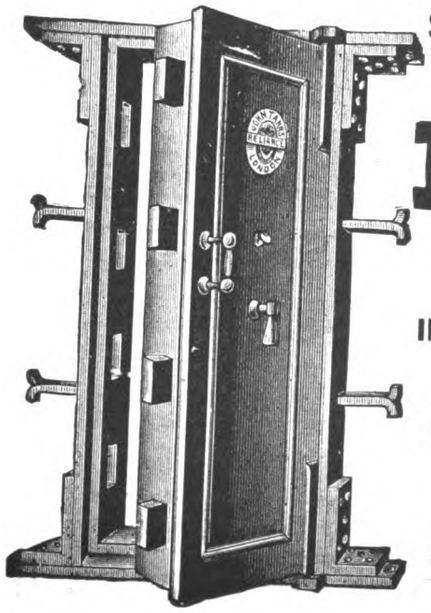
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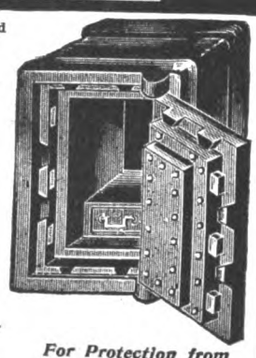
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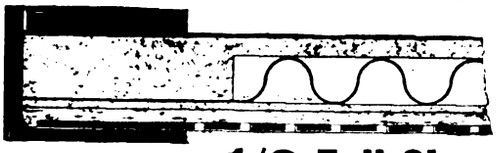
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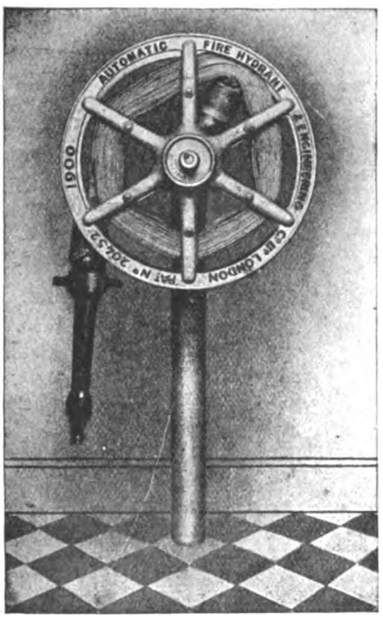
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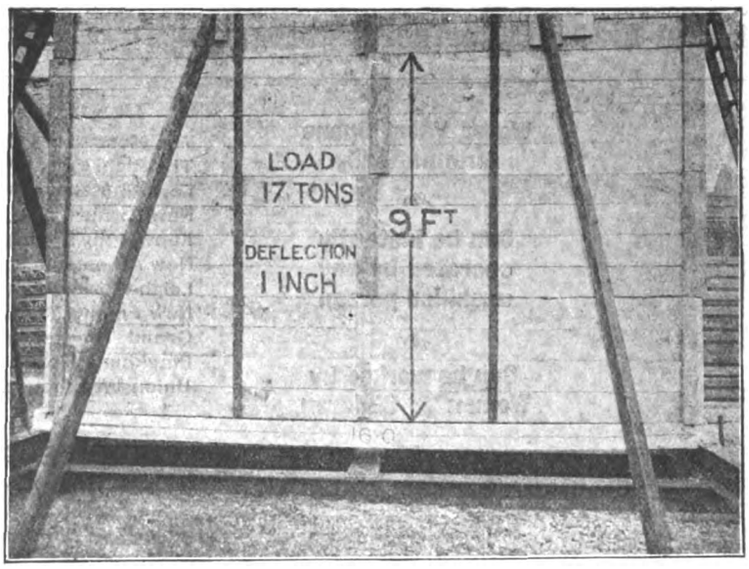
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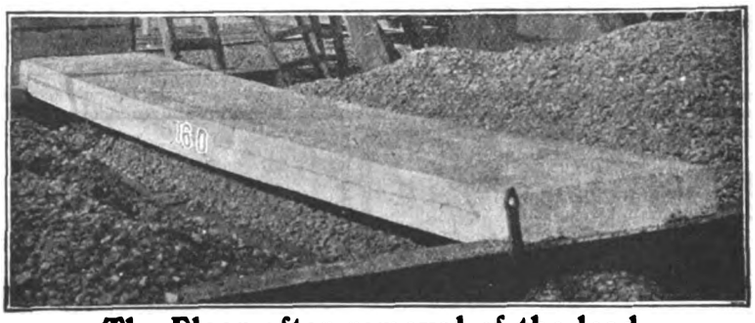
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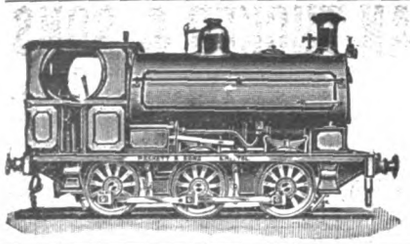
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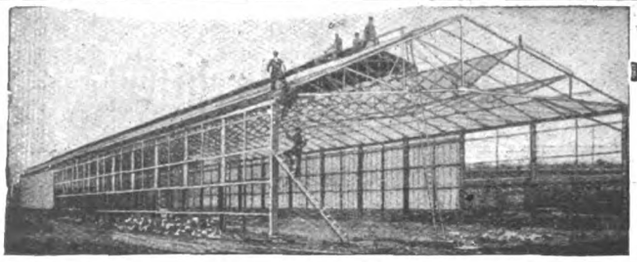


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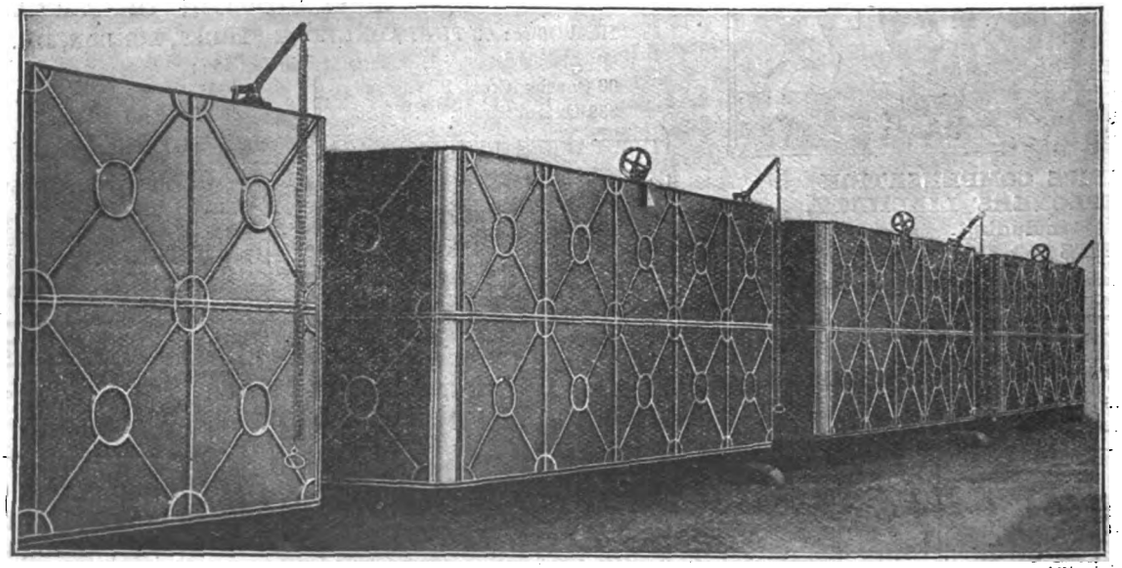
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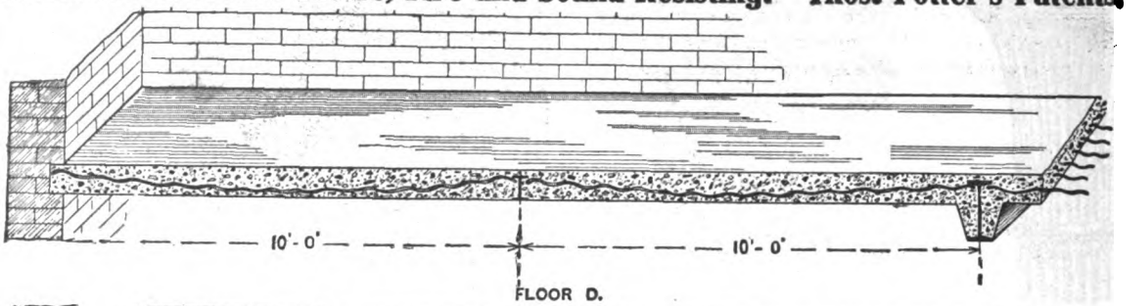
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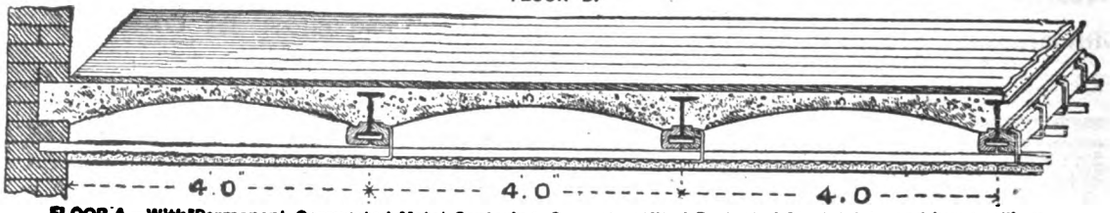
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Architect and Contract Reporter.

FRIDAY, DEC. 3, 1909.

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NOTICE TO ADVERTISERS.

Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than* 2 P.M. *on Thursdays.*

COMPETITIONS OPEN.

HETTON.—Jan. 1.—The committee of the Working Men's Club invite plans for the erection of a new club. Mr. James Widdowfield, Secretary, Hetton Working Men's Club, Pemberton Street, Hetton-le-Hole.

LARNE.—Jan. 1.—For a technical school proposed to be erected in Victoria Street. A premium of 21*l.* will be paid for the approved design. Mr. Thomas Clearkin, Secretary, Technical Instruction Committee, Larne.

LEEDS.—Dec. 18.—The education committee invite architects practising in Leeds to submit designs for proposed training college for teachers, Kirkstall Grange, Far Headingley. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist the committee. Deposit 2*l.* 2*s.* Mr. James Graham, Secretary for Education, Education Department, Leeds.

MINEHEAD.—Dec. 11.—For a shelter with cloak-room and lavatories, on the beach at Minehead, Somerset, to cost not more than 3,000*l.* Deposit 5*s.* Premium 20*l.* The premiated plans to become the property of the Council; or, in event of the architect carrying out the work, the premium will merge in the commission. Mr. L. C. Webber-Incledon, clerk, 16 Park Street, Minehead, Somerset.

OLDHAM.—Feb. 1.—The Town Council invite competitive designs from architects practising or residing within the borough for an extension of the town hall. Premiums of 50*l.*, 30*l.*, and 20*l.* are offered, together with 5*l.* for every competitor who carries out the instructions. Apply to Mr. E. C. Foote, borough surveyor, Oldham, Lancs.

SOUTHEND-ON-SEA.—Dec. 31.—For a new Council school. Competition is limited to architects practising in the borough. Mr. J. W. Barrow, Education Offices, Southend-on-Sea.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.



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CONTRACTS OPEN.

Ashford (Kent).—Dec. 7.—For erection of a bridge over a stream on the road leading from Wye to Plumpton, near Young's Tile Works, for the East Ashford Rural District Council. Mr. Pullen, surveyor, Kennington, Kent.

Barnet.—Dec. 13.—The Guardians of Barnet Union invite alternative tenders for the construction of a water tower having a capacity of 60,000 gallons, as follows:—(1) For a tower having a steel or cast-iron tank, the framing of the tower being formed of steel or of cast-iron columns; (2) for a tower and tank formed entirely of reinforced concrete. Deposit 2*l*. Mr. J. C. Melliss, M.I.C.E., 264 Gresham House, Old Broad Street, London, E.C.

Bawtry.—Dec. 10.—For repairs to walls and asphalting at the Bawtry mixed school, Doncaster. Mr. L. J. Blackburn, divisional clerk, 10 Priory Place, Doncaster.

Bentley.—Dec. 4.—For erection of a cottage at Bentley sewage works, Doncaster. Mr. P. N. Brundell, architect, 1 Prince's Street, Doncaster.

Bingley.—Dec. 4.—For extension of shed at Argyll Mills, Bingley, Yorks. Messrs. Thomas Barker & Son, architects, London, and Midland Bank Chambers, Bradford.

Birkenhead.—Dec. 23.—For construction and erection of a block of buildings for the carburetted water-gas plant, comprising a boiler house with tall chimney, machinery house, steel framed generator house and annexe filled in with brickwork, and a meter house, together with other works, at the gas works, Thomas Street, Birkenhead. Deposit 3*l*. 3*s*. Mr. T. O. Paterson, M.I.C.E., gas works, Thomas Street, Birkenhead.

Blackburn.—Dec. 13.—For erection of police station, sessions court, &c., on Blakey Moor (basement and lower ground floor section). Deposit 1*l*. 1*s*. Send names at once to Messrs. Briggs, Wolstenholme & Thornley, and Messrs. Stones & Stones, joint architects, Richmond Terrace, Blackburn.

Blackhill.—Dec. 4.—For proposed new villa at No. 1, Blackhill. Mr. John J. Eltringham, architect and surveyor, Derwent Street, Blackhill, Durham.

Blackpool.—Dec. 9.—For the supply and fixing of the tile and faïence dados at Blackpool new post-office. H.M. Office of Works, 47 Victoria Street, London, S.W., or the Clerk of Works, New Post Office, Blackpool.

Bridlington.—Dec. 6.—For alterations and additions to the Hilderthorpe Hotel. Messrs. Brodrick, Lowther & Walker, architects, 77 Lowgate, Hull.

Bristol.—Dec. 6.—For the adaptation of Nos. 18 and 20 Victoria Street, for a labour exchange, for the Commissioners of H.M. Works and Public Buildings. The Assistant Architect, H.M. Office of Works, Bristol.

Bromley.—Dec. 7.—For erection of a fire station and a mortuary. Deposit 2*l*. 2*s*. The Borough Engineer, Municipal Offices, Bromley, Kent.

Camborne.—Dec. 13.—For reseating the gallery with sundry alterations and painting the Wesleyan Methodist Church at Camborne, Cornwall. Mr. Sampson Hill, architect, Green Lane, Redruth.

Chadderton (Lancs.).—Dec. 22.—For the erection of a refuse destructor in connection with existing buildings and inclined roadway at the Sewage Disposal Works, Middleton Junction. Deposit 2*l*. The Surveyor to the Council, Town Hall, Chadderton.

Edinburgh.—Dec. 6.—For steelwork, concrete, brick, paving, mason work, &c., in the superstructure and roadway of new bridge carrying the cross road over proposed railway access to the city markets, &c., at Gorgie, for the Edinburgh Corporation Roads Department. The City Road Surveyor, City Chambers, Edinburgh.

Epsom.—Dec. 10.—For erection of a fire station on land adjoining the Council offices at Church Street. Deposit 3*l*. 3*s*. Mr. Edward R. Capon, surveyor to the Council, Church Street, Epsom.

Frizinghall.—Dec. 7.—For works of all trades required in the erection of new warehouse at Dumb Mill, Frizinghall, Bradford. The City Architect, Town Hall, Bradford.

Frome.—Dec. 4.—For new chapel, for the Trustees of the United Methodist Chapel. Mr. W. S. Skinner, F.R.I.B.A., 16 Baldwin Street, Bristol.

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GATESHEAD.—Dec. 7.—For extending and altering engine shed for the North Eastern Railway. Mr. William Bell, the Company's architect, Newcastle-on-Tyne.

GILLINGHAM.—Dec. 4.—For erection of a ten-roomed house, with offices and boundary fences, near to the Rainham Mark, Gillingham, Kent. Deposit 1*l.* 1*s.* Send names by Dec. 4 to Messrs. Whiting Bros., architects, Ospringe, Faversham.

GOSFORTH.—Dec. 4.—For building strong room at the Council Chambers. Mr. George Nelson, A.M.I.C.E., engineer and surveyor to the Council, Council Chambers, High Street, Gosforth, Northumberland.

HEANOR.—Dec. 11.—For the alterations to Council school at Heanor (Codnor Mill Lane), Derbyshire. Deposit 1*l.* 1*s.* Mr. George H. Widdows, A.R.I.B.A., architect to the committee, County Education Office, St. Mary's Gate, Derby.

HULL.—Dec. 13.—Whole tenders for the alteration and additions to Wawne Street school. Deposit 2*l.* 2*s.* Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

IRELAND.—Dec. 8.—For erection of proposed Guy's National schools at Ballymena, County Antrim. Deposit 1*l.* Messrs. W. H. Stephens & Sons, 13 Donegall Square North, Belfast.

IRELAND.—Dec. 20.—For erection of additions to the Ferguson Memorial Schools, Belmont, near Belfast. Mr. Thomas Houston, architect, Kingscourt, Wellington Place, Belfast.

JARROW.—Dec. 7.—The Durham County Council invite sole tenders for erection of a secondary school at Jarrow. Mr. Fred. Rennoldson, architect, 37 King Street, South Shields.

LEEDS.—Dec. 15.—For alterations to and furnishing the offices, Nos. 38 to 46 Great George Street, for the property committee. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

LIVERPOOL.—For demolishing the buildings of the ventilating station, and filling in of certain airways, situated at George's Dock, in the city of Liverpool, for the Mersey Railway Company. Mr. J. Shaw, M.I.C.E., general manager and secretary, Central Station, Birkenhead.

LIVERPOOL.—Dec. 6.—The Commissioners of H.M. Works and Public Buildings are prepared to receive tenders for alterations at the County Court offices H.M. Office of Works, Victoria Street, Liverpool.

LONDON.—Dec. 7.—For alterations and additions to Registry of Seamen, Royal Mint. Deposit 1*l.* 1*s.* Mr. H. N. Hawks, I.S.O., H.M. Office of Works, &c., Storey's Gate, S.W.

LONDON.—Dec. 8.—For the following works:—(1) Erection of an enclosure to coach-houses at the Eastern Ambulance Station, Brooksby's Walk, Homerton, N.E.; (2) construction of additional lavatory accommodation for male staff at the Northern Convalescent Fever Hospital, Winchmore Hill, N. Deposit 1*l.* each. Mr. W. T. Hatch, M.I.C.E., M.I.M.E., engineer-in-chief to the Metropolitan Asylums Board, Embankment, E.C.

LONDON.—Dec. 11.—For the erection of an overground sanitary convenience at the junction of Gap Road and Durnsford Road, Wimbledon, to provide for three urinal stalls. The Borough Surveyor, Town Hall, Wimbledon.

LONDON.—Dec. 13.—The Secretary of State for War invites tenders for the provision of additional accommodation for non-commissioned officers and men in existing barrack block G, Wellington Barracks. Deposit 10*s.* Apply by Dec. 3 to the Office of the Director of Barrack Construction, 80 Pall Mall, London, S.W.

LONDON, S.W.—Dec. 13.—For sundry alterations and additions to existing buildings at their Battersea works, for the Metropolitan Water Board. The Offices of the Chief Engineer, Savoy Court, Strand, W.C. Deposit 5*l.* with the Accountant at Savoy Court, Strand, W.C.

NORTHFLEET.—Dec. 14.—For the erection of fire station, High Street. Deposit 2*l.* 2*s.* Apply at once to the District Surveyor, The Hill, Northfleet, Kent.

OLDHAM.—Dec. 8.—For the whole of the work required in erection of lavatories at the Market Grounds. The Borough Surveyor's Office, Town Hall, Oldham.

ORMSKIRK.—Dec. 8.—For building a dining-hall and kitchen at the workhouse, for the Guardians of Ormskirk Union (Lancs). Mr. Dod, architect, 16 Exchange Buildings, Liverpool.

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Salford.—Dec. 6.—For a new annexe extension, and for sundry alterations to the Salford town hall and offices in Bexley Square. Deposit 1*l.* 1*s.* Mr. James B. Broadbent, A.R.I.B.A., 15 Cooper Street, Manchester.

Scotland.—Dec. 14.—For the adaptation of part of the Custom House building at Greenock for a labour exchange. Deposit 1*l.* 1*s.* The Collector of Inland Revenue, Custom House, Greenock, or H.M. Office of Works, Parliament Square, Edinburgh.

Shotley Bridge.—For proposed alterations and additions to the King's Head Inn. Forward names to Mr. D. M. Spence, architect and surveyor, Shotley Bridge.

Skircoat.—Dec. 15.—For the following trades: Mason's, joiner's, plumber's and glazier's, plasterer's, stone slater's and concretor's required in erection of a detached house in Skircoat, Halifax. Messrs. Joseph F. Walsh, F.S.I., & Graham Nicholas, F.R.I.B.A., architects and surveyors, Museum Chambers, Halifax.

Sneinton.—For new church of St. Christopher's, Colwick Road, Sneinton, Notts. Deposit 1*l.* 1*s.* with Mr. F. E. Littler, A.R.I.B.A., architect, Lowdham, Notts.

Swinton.—Dec. 10.—The West Riding education committee invite whole or separate tenders for the following works, viz.:—Swinton Bridge provided school, alterations and additions (builder, joiner, slater, plumber, plasterer, painter); Swinton Kilnhurst provided school, alterations and additions, builder, joiner, slater, plumber, plasterer, painter, heating engineer). Deposit 1*l.* 1*s.* each The West Riding Architect, County Hall, Wakefield.

Tudhoe Grange.—Dec. 14.—For new Council school (for about 810 scholars) at Tudhoe Grange, Spennymoor. Mr. W. Rushworth, Shirehall, Durham.

Wales.—Dec. 7.—For two detached houses on The Maindy, Pentre, Ystrad. Messrs. T. E. Richards & Kaye, architects, Pontypridd.

Wales.—Dec. 8.—For erection of twenty-one houses at Wattstown, Rhondda Fach, for the Wattstown Building Club, No. 2. Messrs. A. O. Evans, Williams & Evans, architects, Pontypridd.

Wales.—Dec. 8.—For erection of a workmen's library and institute at Abertridwr. Deposit 3*l.* 3*s.* Mr. Illtyd Thomas, F.S.I., 17 Quay Street, Cardiff.

Wales.— Dec. 9.—For erection of twenty or more cottages at Mount Pleasant, Merthyr Vale, for the South Wales Estates Co., Ltd., Mr. W. Dowdeswell, architect, Treharris.

Wales.—Dec. 11.—For erection of twenty or more houses on the Lawrence Estate, near New Tredegar (Mon.), for the Greenmeadow Building Club. Mr. D. W. Price, architect, Cloth Hall, New Tredegar.

Wales.—Dec. 11.—For alterations and additions to Gowerton Police Station, Glamorgan. The County Council Offices, Westgate Street, Cardiff.

Wales.—Dec. 13.—For erection of proposed "Garth Rest" for consumptives, Pentyrch, near Cardiff. Deposit 2*l.* 2*s.* Mr. John H. James, M.S.A., architect, Taff's Well, Cardiff.

Wales.—Dec. 15.—For proposed additions and alterations to premises in Penygraig Road, Penygraig. Mr. W. Lewis, secretary to the Penygraig and District Labour and Progressive Club.

Walthamstow.—Dec. 10.—For the erection and completion of a fire station in Wood Street. Deposit 3*l.* 3*s.* Mr. C. S. Watson, town clerk, the Town Hall, Orford Road, Walthamstow.

Warrington.—Dec. 19.—For supply of two small sliding partitions, for the Education Committee. Mr. J. Moore Murray, secretary and director, Education Office, Warrington.

Weymouth.—Dec. 11.—For work to be done at the R.G.A. Drill Hall. Mr. S. Jackson, M.S.A., architect and surveyor, Bridge Chambers, Weymouth.

The Glasgow Corporation last week agreed that, with a view to the diminution of the smoke nuisance, it be remitted to a special committee to make arrangements for the holding of an exhibition for the purpose of showing the public the most up-to-date appliances for lighting, heating and cooking purposes.

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TENDERS.

BURY (LANCS.).

For the following works at Ainsworth, for the Bury Rural District Council:—Contract No. 1—Construction of tanks, bacteria beds, &c., and the supply and erection of travelling sprinklers, &c. Contract No. 2—Construction of 24-inch, 21-inch, 18-inch, 15-inch, and 12-inch diameters stoneware and cast-iron intercepting sewer, manholes, lattice girder bridges, &c. Contract No. 3—Construction of main sewer No. 1, manholes, &c. Mr. E. T. MORLAND JOHNSON, M.I.M.E., engineer, Bank of England Chambers, Tib Lane, Cross Street, Manchester.

Contract No. 1.

J. & T. Binns	£3,586 7 5
A. H. & S. Johnson	3,500 0 0
Byrom	3,499 0 0
Stark	3,463 12 11
Jenkins & Son	3,428 0 0
Worthington & Co.	3,359 11 7
Brebner & Co.	3,317 7 0
Nowell	3,248 7 6
Macdonald & Deakin	3,136 7 4
Annakin	3,085 7 8
Cowburn & Sons	3,055 9 6
Johnson & Langley	2,977 4 0
Edmondson & Wyatt	2,973 4 7
Johnson Bros.	2,860 1 7
Horrocks	2,837 2 0
Graham & Sons	2,788 0 0
Bell & Sons	2,730 7 7
Firth & Co.	2,786 12 2
Freeman & Sons	2,629 9 6
POLLITT & Co., Bolton (*accepted*)	2,459 6 8
Engineer's estimate	2,569 11 6

Contract No. 2.

Byrom	5,849 0 0
Stark	5,808 8 8
Worthington & Co.	5,772 0 4
Edmondson & Wyatt	4,834 2 2
Nowell	4,631 18 4
Annakin	4,415 4 3
J. & T. Binns	4,415 1 11
Partington & Son	4,410 13 5
Johnson Bros.	4,382 9 6
Turner	4,163 9 3
Johnson & Langley	4,132 9 0
Bell & Sons	4,106 7 8
Firth & Co.	4,080 18 10
Cowburn & Sons	4,079 10 0
Jenkins & Son	3,942 0 0
Brebner & Co.	3,879 0 0
Macdonald & Deakin	3,792 13 4
Graham & Sons	3,670 0 0
Freeman & Sons	3,430 0 11
POLLITT & Co. (*accepted*)	3,373 17 5
Horrocks	3,112 5 9
Engineer's estimate	3,528 16 0

Contract No. 3.

Byrom	1,249 0 0
Worthington & Co.	1,205 3 0
Nowell	1,044 15 6
J. & T. Binns	1,015 4 9
Partington & Son	1,004 3 8
Bell & Sons	998 8 5
Stark	996 16 3
Annakin	963 17 4
Johnson & Langley	953 10 0
Cowburn & Sons	931 2 0
Jenkins & Son	917 0 0
Johnson Bros.	903 17 8
Macdonald & Deakin	901 9 5
Graham & Sons	896 0 0
Edmondson & Wyatt	885 18 1
Firth & Co.	871 8 10
Turner	836 13 10
Freeman & Sons	807 8 9
Brebner & Co.	763 3 1
Horrocks	729 0 5
POLLITT & Co. (*accepted*)	724 1 3
Engineer's estimate	791 3 3

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Ellis & Sons	2,213 8 6
Trussed Concrete Steel Co.	2,200 0 0
Cowlin & Sons	2,098 0 0
Moss & Sons	2,050 0 0
British Fire Proof Construction Co.	2,039 0 0
Hibbert & Co.	1,982 0 0
Stuart's Granolithic	1,923 0 0
Smith & Co.	1,913 0 0
Brazendale	1,823 0 0
Empire Stone Co.	1,808 0 0
Hoborough & Co., Gloucester, Hennebique (*accepted*)	1,803 0 0
Columbian Fire Proofing Co.	1,682 0 0
Vale & Sons	1,680 0 0
Leslie & Co.	1,341 0 0

FLEET.

For the erection of Fleet Road International Stores. Messrs. George Baines & Son, architects, 5 Clement's Inn, Strand, W.C.

	Estimate A.	Estimate B.
Charman	£1,689 0 0	£568 0 0
Stewart & Sons	1,609 0 0	519 0 0
Wise	1,590 0 0	560 0 0
Battley, Sons & Holness	1,541 0 0	476 0 0
Horsell	1,512 0 0	397 0 0
Minter	1,498 0 0	600 0 0
Carter	1,490 0 0	475 0 0
Pool & Sons	1,456 0 2	459 19 8
Musselwhite & Sapp	1,448 0 0	535 0 0
Wallis, Ltd.	1,420 0 0	470 0 0
Jerram	1,393 0 0	509 0 0
Kemp & Co. (*accepted*)	1,389 0 0	498 0 0

ESTON.

For continuation of Grange Road. Mr. C. McDermid, surveyor, Grangetown, S.O., Yorks.

Crombie & Son	£408 12 10
Fowells & Sons	385 7 7
Dunn	383 3 2
Goodall Bros.	380 19 1
Hobbs	366 9 4
Radge	294 11 10
Smith, Grangetown (*accepted*)	294 5 0

HORWICH.

For new street works in the Beehive district. Mr. T. Green, surveyor.

Kearns	£2,220 19 1
Slater	1,979 5 6
Pollitt & Co.	1,923 18 0
Yates, Horwich (*accepted*)	1,802 15 3
Horrocks	1,785 3 8

LONDON.

For alterations at the police-station at Kennington Lane, S.E. Mr. J. Dixon Butler, F.R.I.B.A., Surveyor to the Metropolitan Police, New Scotland Yard, S.W.

Ansell	£5,000 0 0
Rice & Sons	4,949 0 0
F. & H. Higgs	4,786 0 0
Smith & Sons	4,718 0 0
Lole & Co.	4,642 0 0
Roome & Co.	4,623 0 0
Minter	4,618 0 0
Eyre	4,595 0 0
Lathey Bros.	4,575 0 0
Holloway Bros., Ltd.	4,550 0 0
Higgs & Hill, Ltd.	4,549 0 0
Holliday & Greenwood	4,545 0 0
Mowlem & Co., Ltd.	4,540 0 0
Patman & Fotheringham	4,433 0 0
Fryer & Co.	4,371 0 0

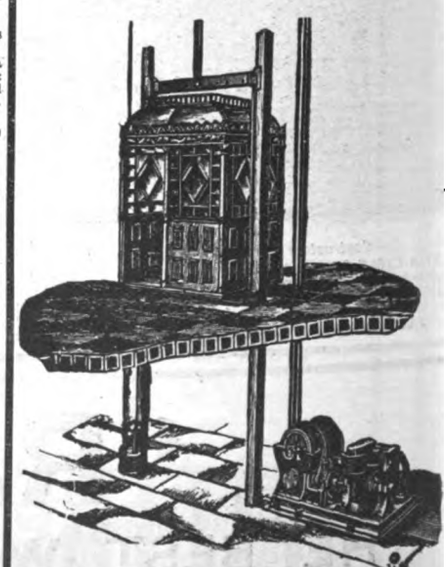
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LONDON—*continued.*

For the wiring and supply of the fittings for electric light installation at the Camberwell New Road fire station, for the London County Council.

Pinching & Walton	£176	5	0
Fryer & Co.	168	10	0
Barker & Co., Kensington (*recommended*)	139	13	0

For the wiring and supply of the fittings for electric lighting installation at the Waterloo Road fire station, for the London County Council.

Leonard & Co.	£240	0	0
Tilley Bros.	226	0	0
Fryer & Co.	222	0	0
Taylor & Co., Bush Lane (*recommended*)	208	15	0
Chief Engineer's estimate	236	0	0

For the making-up and paving of Badminton Road, Balham, for the Wandsworth Borough Council. Mr. P. DODD, borough engineer.

Potter & Co.	£1,150	0	0
E. & E. Iles	1,075	0	0
Swaker	1,074	9	9
Dykes	1,070	0	0
Adams	1,034	0	0
Mowlem & Co.	1,028	0	0
Parry & Co.	1,006	0	0
Harringdon & Co.	1,005	0	0
Lane & Co. (*recommended*)	954	0	0
Borough Engineer's estimate	999	10	0

For making-up and paving Wyatt Park Road, Streatham, for the Wandsworth Borough Council. Mr. P. DODD, borough engineer.

Dykes	£1,744	0	0
Potter & Co.	1,660	0	0
Mowlem & Co.	1,593	0	0
E. & E. Iles	1,570	0	0
Adams	1,545	0	0
Lane & Co.	1,531	0	0
Parry & Co.	1,480	0	0
Harringdon & Co.	1,468	0	0
Swaker (*recommended*)	1,306	8	1
Borough Engineer's estimate	1,498	4	2

LONDON—*continued.*

For the making-up and paving of that part of Welham Road, Streatham, which lies between Mitcham Lane and Ribblesdale Road, for the Wandsworth Borough Council. Mr. P. DODD, borough engineer.

Dykes	£1,581	0	0
Lane & Co.	1,476	0	0
Mowlem & Co.	1,413	0	0
Adams	1,408	0	0
Harringdon & Co.	1,408	0	0
Parry & Co.	1,395	0	0
Potter & Co.	1,390	0	0
Grover & Co.	1,359	6	3
E. & E. Iles	1,309	0	0
Swaker (*recommended*)	1,121	3	3
Borough Engineer's estimate	1,370	0	0

For making-up and paving of Langside Avenue, Putney, for the Wandsworth Borough Council. Mr. P. DODD, borough engineer.

Potter & Co.	£900	0	0
Lane & Co.	895	0	0
Dykes	870	0	0
Adams	840	0	0
Mowlem & Co.	802	0	0
Harringdon & Co.	716	0	0
Parry & Co.	714	0	0
Swaker (*recommended*)	667	17	9
Borough Engineer's estimate	833	6	3

For making-up and paving part of Wavertree Road, Streatham, for the Wandsworth Borough Council. Mr. P. DODD, borough engineer.

Hyde & Co.	£1,308	0	0
Swaker	973	3	3
Dykes	961	0	0
Mowlem & Co.	956	0	0
Potter & Co.	950	0	0
Adams	910	0	0
Harringdon & Co.	908	0	0
Lane & Co.	906	0	0
E. & E. Iles	900	0	0
Parry & Co. (*recommended*)	890	0	0
Borough Engineer's estimate	886	14	2



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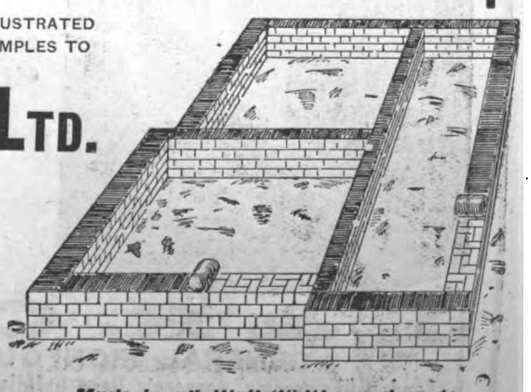
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LONDON—*continued.*

For erecting on the Hoxton House site, Hoxton, (1) an elementary school for 623 children; (2) a higher school for 390 children; (3) a school for 80 physically and 80 mentally defective children, and (4) for a handicraft centre for 40 boys, cookery, and housewifery centres and a schoolkeeper's house, for the London County Council.

Todd & Newman	£36,240 0 0
Garrett & Son	35,806 0 0
McCormick & Sons	33,779 0 0
Lawrence & Son	33,433 0 0
Kirk & Randall	33,368 0 0
Treasure & Son	33,012 0 0
J. & M. Patrick	32,990 0 0
Patman & Fotheringham	32,741 0 0
Johnson & Co., Wandsworth Common (*recommended*)	32,633 15 11

NEWBURY.

For erecting ten cottages for the Town Council. Mr. S. J. L. Vincent, borough surveyor, Newbury.

Whiting	£1,961 0 0
Chivers	1,870 0 0
Hoskings Bros.	1,851 0 0
Edwards	1,806 0 0
Plumb	1,783 0 0
H. Elms	1,700 0 0
Hedge	1,618 0 0
Hedges Bros.	1,578 0 0
Townsend	1,550 0 0
Houghton & Hitchman	1,549 0 0
G. Elms	1,515 0 0
Bastin (*recommended*)	1,495 0 0

NORTHWOOD.

For making-up of Carew Road for Ruislip-Northwood Urban District Council. Mr. W. Louis Carr, surveyor, Northwood, Middlesex.

Paterson, Ltd.	£2,389 9 0
Young	1,950 14 7
Free & Sons.	1,777 6 6
Adams	1,711 3 9
Mann	1,700 0 0

NORTHWOOD —*continued.*

Langley & Johnson	1,698 19 6
Swaker	1,692 6 11
Trueman, Ltd.	1,645 0 0
Champniss	1,619 7 6
Wooster	1,594 14 10
Watson, Junr.	1,557 0 0
Clements, Knowling & Co., Brentford (*accepted*)	1,547 0 0

SOUTHAMPTON.

For the erection of the East Street Baptist Church and Schools. Messrs. George Baines & Son, architects, 5 Clement's Inn, Strand, W.C.

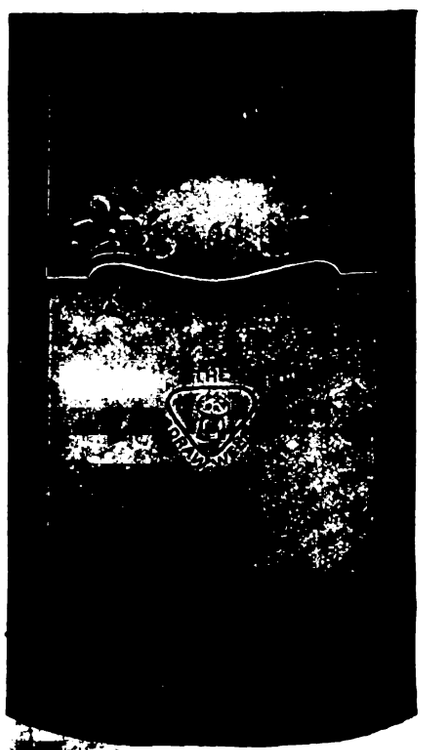
	Estimate A.	Estimate B.
Walter & Son	£7,150	£730
Barter	7,000	750
Golding & Ansell	6,950	700
Wright & Son	6,903	652
Cawte	6,893	630
Stevens & Co.	6,845	679
Minter	6,842	673
Udall & Co.	6,840	639
Dyer & Sons	6,789	660
Jenkins & Sons	6,564	626
Jerram	6,189	590
Nichol (*accepted with modifications*)	6,178	560

STANLEY.

For erecting Council offices in Front Street. Mr. J. W. Wilson, architect, Sutton Coldfield, Warwickshire.

Jennings	£4,819 19 3
Dyson Bros.	4,636 14 8
Weatherly	4,606 0 0
Davis	4,522 2 0
Jobling	4,493 8 4
George	4,480 0 0
Bewley	4,449 0 0
White	4,420 0 0
Bolam	4,301 2 7
Hall	4,277 19 0
Reynoldson & Son	3,838 0 0
Dallon & Long	3,750 0 0
Southern	3,720 0 0
Worley, Tantobie (*accepted*)	3,499 14 0

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MEMORIAL SCREEN IN FULBOURN ST. VIGOT.

WALES.

For erecting playsheds at Williams's Endowed Schools, Caerleon. Mr. H. J. GRIGGS, architect, Newport, Mon.

Jenkins	£556 0 0
Williams & Son	506 0 0
Evans	402 14 10
Parkyn	381 0 0
Phillips, Clark & Co.	375 0 0
Richards	368 11 0
Saunders	350 5 0
Charles	347 0 0
Williams	344 0 0
Jordan & Son	340 0 0
Prosser	336 0 0
Jenkyn	334 0 0
Parfitt	330 0 0
Leadbeter	328 0 0
Reed	310 0 0
DEAN, Newport (*accepted*)	271 10 0

For alterations and repairs to Council School, Llandrygarn. Mr. J. OWEN, county architect, Menai Bridge and Holyhead.

O. Jones	£965 0 0
J. & J. W. OWEN, Llanlilwn (*accepted*)	895 7 0
R. J. Jones	878 0 0
Thomas	850 0 0

For alterations and repairs to Council school, Pensarn. Mr. J. OWEN, county architect, Menai Bridge and Holyhead.

J. Owen & W. Williams	£1,918 0 0
Jones	1,885 0 0
J. & J. W. Owen	1,818 9 0
R. Thomas	1,478 0 0
O. THOMAS, Amlwch (*accepted*)	1,450 0 0

WETTON.

For alterations and additions to Swainsley, Wetton, near Ashbourne. Messrs. W. SUGDEN & SON, architects, Leek.

Heath & Sons	£750 0 0
Smith & Son	695 10 6
Wilson	693 3 6
Riley	689 10 0
Moss, Waterhouse, near Ashbourne (*accepted*)	599 10 0

TRADE NOTES.

WE are informed that the purchase of Messrs. Marsh, Son & Gibbs, Ltd., Bath stone concern by a local company, as recently announced in the Press, did not embrace the whole of the area of the Hartham Park mineral originally leased to Messrs. Marsh, Son & Gibbs, Ltd., as the Yockney and Hartham Park Stone Company, Ltd., comprising several old-established firms, have acquired upwards of sixty acres of this land, where active operations are now being carried on by them.

MESSRS. WILLIAM POTTS & SONS, LTD., clock manufacturers, of Leeds and Newcastle, have just erected new large clock at Messrs. Woollans Bros., Fossgate, York, and a striking clock and bell at Becca Hall, Aberford, and are now erecting a new clock and chimes and illuminated dials at Holmebridge Church, and new hour-striking illuminated clock at Marsden Institute, near Huddersfield; new clock and bell for the new Garden City, Hull, and new clock, chimes, and bells at St. Peter's, South Bank, North Yorkshire. All the above clocks are from the designs and plans of the late Lord Grimthorpe, with all the latest improvements inserted. Messrs. Potts have also just thoroughly cleaned and adjusted Howden Minster clock, East Yorks, erected by them forty years ago.

THE Yorkshire Lawn Tennis Association contemplates the expenditure of 1,500*l.* on the erection of a pavilion at Scarborough in connection with the new courts that are to be laid down on the South Cliff by the Town Council.

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VARIETIES.

The Salt Union are making preparations for the establishment of extensive new works on the banks of the Manchester Ship Canal at Runcorn.

New coal-mining villages are to be erected at Binley and Wyken, near Coventry, which will accommodate a population of 12,000. At Wyken a beginning has already been made with cottages, and plans are being prepared for 2,000 tenements, covering six miles of streets. Further, it is anticipated that sinkings will be shortly commenced at Whitmore Park, with consequent large building development in Keresley parish.

In many unions in different parts of Ireland it has been found difficult to get contractors for the model plan cottage suggested by the Local Government Board, and adopted by the greater number of district councils, even at the maximum figure allowed. At a recent meeting of the Boyle No. 2 District Council, the engineer, Mr. John M'Donagh, submitted a modification of the plan of the Local Government Board, which, he said, would save about 12*l.* on each single cottage, and therefore make it more likely that contractors would be found. At the last meeting of the Council a letter from the Local Government Board was read sanctioning the proposed modification of the plan.

The Institution of Municipal Engineers held a Council meeting on November 27, when sixteen applications for admission to membership and three for admission to studentship were considered. Eleven applicants were elected to membership and three to studentship. The roll of the Institution now stands at 641 members and 92 students, making a total of 733. The President and the two Vice-Presidents of the Institution were elected as delegates to the Council of the National Association of Local Government Officers. The letter from the Hon. Secretary of the Municipal Engineers' Imperial Defence Committee was considered, and it was decided to refer the whole matter back for further consideration. A number of letters expressing approval of the proposed formation of an associate member class were presented by the Secretary, and further consideration of the matter was deferred. It was decided also to defer consideration of the Secretary's report.

The Paint and Varnish Society will hold their next meeting on the 9th inst., when a general debate will take place on "The Advantages and Disadvantages of Washable Distempers." The debate will be opened by Mr. J. Cruickshank Smith with a general survey of the points at issue, and representative speakers will present the varying views of the manufacturer, the general consumer, the decorator, the designer, the architect and the wall-paper manufacturer. The meeting will be held as usual at St. Bride's Institute, commencing at 8 p.m.

Interest in the controversy between the critics and the German Museum authorities, who have paid some thousands to a Londoner for a wax bust attributed to Leonardo da Vinci, is likely to be renewed by the advent in the auction room of three fine examples of the work of Lucas, by whom the *soi-disant* Leonardo bust is said to have been executed. Undoubtedly an artist of refined skill, Lucas was a *protégé* of Lord Palmerston, and lived near Southampton, where he maintained for many years an intimate friendship with W. H. Rogers, a Justice of the Peace and Mayor of the ancient town. A result of this association was three highly finished medallion portraits of Mr. and Mrs. Rogers and a third one of the Mayor's father. These portraits have never been out of the possession of the family, and are now on view at Messrs. Knight, Frank & Rutley's galleries, where they will be sold by auction on Friday, December 10. They afford pleasant evidence of the artistic ability and restrained feeling so characteristic of the English sculptor.

HOUSES AT HAMPSTEAD GARDEN SUBURB.

These houses are built on the western side of Hampstead Way in the Hampstead Garden Suburb. They were designed by Mr. J. Bruce Merson, M.S.A., architect, 14 Wordsworth Road, Wallington, Surrey, for and built by the Carshalton District Development Company, Ltd. The walls are of brick, finished outside with a red brick plinth up to height of ground floor window-sills and above that covered with rough cast; the roofs are covered with red tiles, and the woodwork of windows and doors generally is painted green.

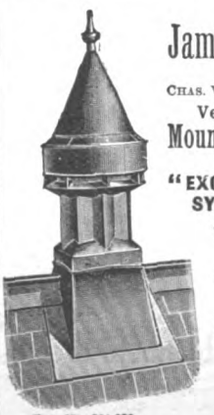
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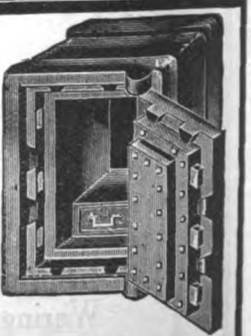
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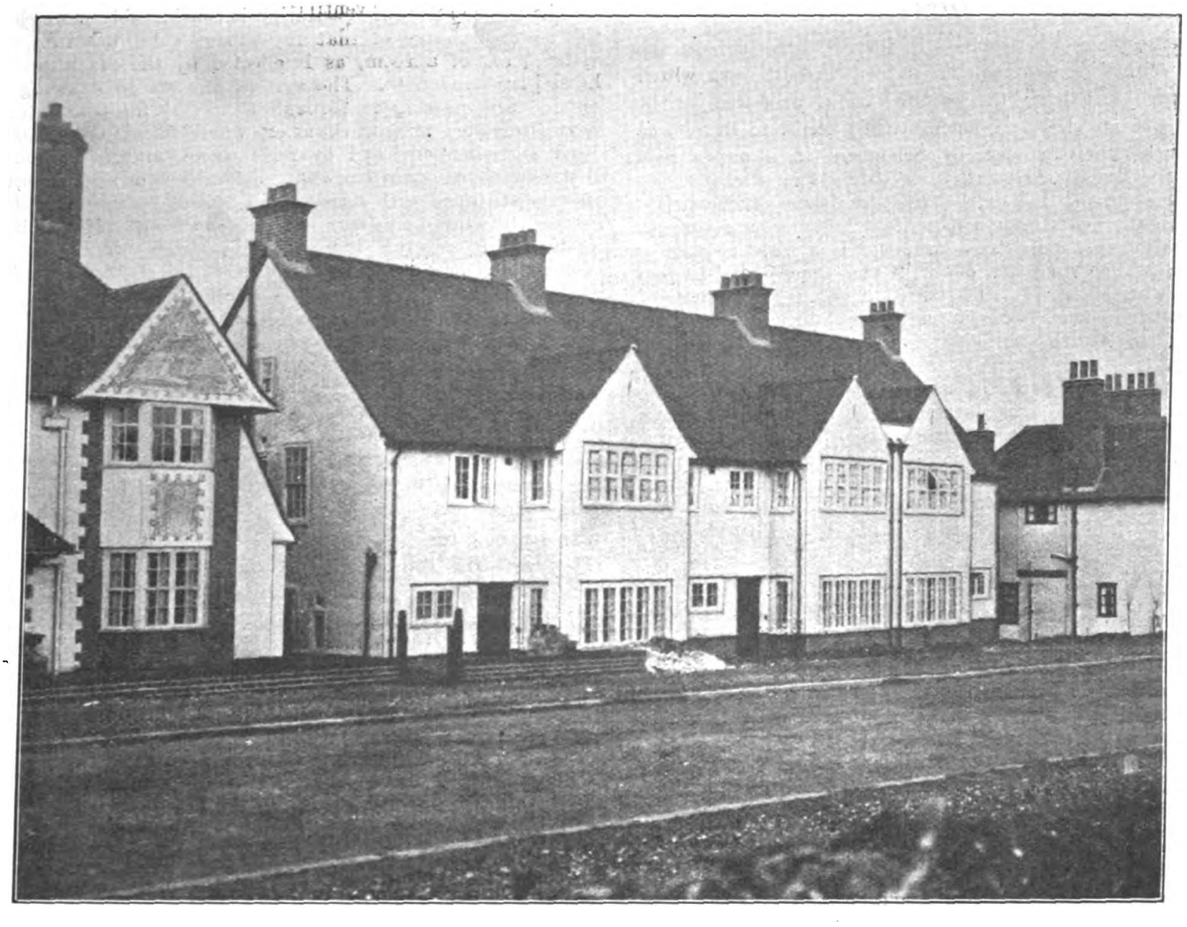

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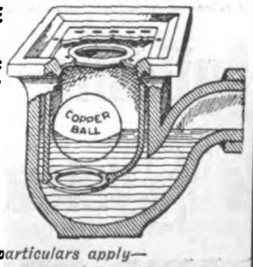
HOUSES AT HAMPSTEAD GARDEN SUBURB. *[J. Bruce Morson, Architect.*

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OZONE.

Although the word "ozone" is derived directly from the Greek word "ozo" (I smell), it is a modern word which was coined to express the peculiar odour produced by the working of an electrical machine. It seems to have been first authoritatively used by Schonbein in a paper read before the British Association in 1840. The substance has ever since proved one of the great problems of chemistry. It was many years later demonstrated that ozone is oxygen in an allotropic state, as a diamond is a form of coke or charcoal. The quantity of it in the atmosphere is very small, being about 3 in 1,000,000; but its efficacy in destroying unwholesome bacteria, micro-organisms and other enemies to health, through its intensely oxidising properties, is extraordinary. Its peculiar properties may be described in the words of a novelist written nearly fifty years ago:—"The aristocratic ozone being absent from the atmosphere, there was a flatness about all the dancing of all those who considered themselves above the plebeian ranks of the tradespeople." Fortunately the production of invigorating and germ-killing ozone and its infusion into a flat, stale and unprofitable atmosphere is within human power. It has for many years been known that if electric discharges are passed through oxygen by means of platinum wires the oxygen becomes ozonified. In 1875 an apparatus called an ozoniser was constructed by Houzeau. Since then other types of ozonisers have appeared.

Within the last few years a company has been at work manufacturing apparatus for the commercial production of ozone for all of its many purposes. Ozonair, Ltd., at their showrooms in 96 Victoria Street, S.W., show generators for the production of ozone for domestic use, medical purposes, water sterilisation, bleaching oils, disinfection of laundries, brewing of beer and other uses. For domestic use there are several varieties of small hanging and standing portable generators for alternating and continuous current supply; when the supply is continuous a converter has to be obtained. The fan, it should be mentioned, can be turned on, if desired, independently of the ozone. Where no public supply of electricity is available a small accumulator or primary battery is employed.

The ozone system of ventilation is considerably more than the mere discharge of that mysterious substance into the vitiated air of a room, as is effected by the machines we have just alluded to. The system consists in drawing in outside air, passing it through a special filtering screen, next through a mixing chamber, where it is further sterilised and then enriched by pure ozone, and it is finally distributed in the various apartments. The mixing chamber may be equipped with a heating or cooling coil. The system is readily adapted to suit special conditions. It has been utilised for several important buildings, including in London the new premises of Messrs. D. H. Evans, Ltd., Oxford Street; the Piccadilly Hotel, part of the Law Courts, Lloyd's, and Messrs. Debenham & Freebody, Wigmore Street; while it has been much employed in the provinces as well as on the Continent, and, in fact, all over the world.

The Normanton Urban District Council, having received the sanction of the Local Government Board to a scheme of main outfall sewerage and sewage disposal, have awarded the contract for the work to Messrs. W. Waring & Sons, Huddersfield. It is proposed to lay several miles of outfall sewers, so as to provide for future building developments. At the disposal works the sewage up to three times the dry-weather flow will be treated with alumino-ferric in three precipitation tanks having a capacity of three-quarters of the dry-weather flow. The clarified sewage is then to be conveyed to a dosing chamber, from which it will flow on to continuous percolating filters at the rate of fifty-four gallons of dry-weather flow per cubic yard of filter. The filter effluent will then pass through sand filters 18 inches deep before discharging into the Waindyke Burn. Screening and detritus tanks are to be provided, and the storm water will be dealt with in two storm-water tanks. The sludge will be raised by pumps driven by oil engines, and dug into the land, five acres of which has been purchased. The consulting engineers are Messrs. D. Balfour & Sons, of London and Newcastle-on-Tyne, and the consulting surveyor Mr. A. Hartley, of Castleford.

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THE STANDARD SYSTEM OF MEASUREMENT OF SLATING AND ROOF TILING.

THIS standard system of measurement, as agreed upon by the Council of the Quantity Surveyors' Association and the London Association of Slate Merchants and Master Slaters, was referred to in our Notes and Comments last week, and we have been asked by the London Association of Slate Merchants and Master Slaters to print the terms of the rules in full. The rules are registered at Stationers' Hall and must not be reprinted from our paper.

Slating.

Superficial.—A superficial measurement of the slating to be given representing the net area covered after deducting all openings containing 4 superficial feet and over. The slating to sides of mansard roofs and vertical slating to dormer cheeks, gables, &c., to be similarly measured but given separately. Circular slating to be similarly measured and given separately with radius of slating and any other special description. The description of slating to conical, octagonal, or other turrets to state the diameter at the base and apex and the height of roof. The description in all cases to state the kind and size of the slates, length of lap, method of fixing, and the kind and number of nails to each slate, and if to include for torching or bedding.

Eaves.—A lineal measurement of all eaves to be given as "extra to eaves course," and to state (when required) to be bedded in cement. When the eaves are raking or cut to suit the fall of gutters, the above description to be supplemented by the words "to falls including cutting and waste."

Verges.—A lineal measurement to be given as "extra to verges," and to state (when required) (1) whether slates of slate and half width are intended to be used; (2) whether an extra under or cloak course is to be fixed; and (3) if the item is to include for pointing to the edge in cement. NOTE: When the verges are on skew the above description to be supplemented by the words "on a skew including cutting and waste."

Top Edge of Slating.—A lineal measurement of all top edges of the slating to be given as "cutting and waste to top edge of slating," and this is also to be given under sills of dormers, lanterns, skylights, and against lower sides of chimney stacks, and all other openings which occur in the slating.

Square Abutments.—A lineal measurement of all cuttings of slating to be given as "cutting and waste to square abutments," and to be given where the slating abuts against the sides of all chimney stacks, dormer cheeks, skylights, and other openings. Where the slating is executed between two parapet walls similar cutting is to be measured at one end of the roof only.

Cuttings.—A lineal measurement of all cuttings against skew abutments to be given as "raking cutting and waste to skew abutments." A lineal measurement of all circular cuttings to be given as "circular cutting and waste."

Valleys.—A lineal measurement on both sides of all valleys to be given as "cutting and waste to sides of valleys (both sides measured)."

Hips.—A lineal measurement on both sides of all hips where coverings are used to be given as "cutting and waste to hips (both sides measured)." A lineal measurement of all mitred hips to be given as "extra to close cut and mitred hips and including cutting and waste on both sides," if pointed to be so described.

Ridges.—A lineal measurement of tile or slate ridges and hips with description to be given, and all cut and splayed ends separately given. All mitres and intersections to be numbered and fully described.

Roof Tiling.

Superficial Measurement of Tiling.—A superficial measurement of the tiling to be given representing the net area covered after deducting all openings containing 4 superficial feet and over. The tiling to sides of mansard roofs and vertical tiling to dormer cheeks, gables, &c., to be similarly measured but given separately. Circular tiling to be similarly measured and given separately with radius of tiling and any other special description. The description of tiling to conical, octagonal, or other turrets to state the diameter at the base and apex and the height of roof. The description in all cases to state the kind and size of the tiles, the lap to which they are to be laid, the method of fixing, the kind and number of nails or pegs to each tile, and if to include for torching or bedding.

Eaves.—A lineal measurement of all eaves to be given as "extra to eaves course," and to state (when required) to be bedded in cement. When the eaves are raking, or cut to suit

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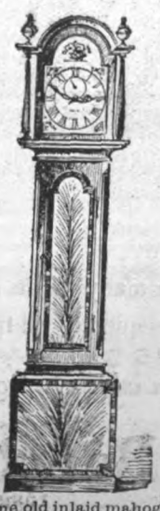
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the fall of gutters, the above description to be supplemented by the words " to falls including cutting and waste."

Verges.—A lineal measurement of all verges to be given as " extra to verges," and to state (when required) (1) whether tiles of tile and half width are intended to be used ; (2) whether an extra under or cloak course is to be fixed ; and (3) if the item is to include for pointing to edge in cement. NOTE : When the verges are on skew the above description to be supplemented by the words " on skew including cutting and waste."

Top Edge of Tiling.—A lineal measurement of all top edges of tiling to be given as " cutting and waste to top edges of tiling," and this is also to be given under sills of dormers, lanterns, skylights, and against lower sides of chimney stacks, and all other openings which occur in the tiling.

Square Abutments.—A lineal measurement of all cuttings of tiling to be given as " cutting and waste to square abutments," and to be given where the tiling abuts against the sides of all chimney stacks, dormer cheeks, skylights, and other openings. Where the tiling is executed between two parapet walls similar cutting is to be measured at one end of roof only.

Cuttings.—A lineal measurement of all cuttings against skew abutments to be given as " raking cutting and waste on tiling to skew abutments." A lineal measurement of all circular cuttings to be given as " circular cutting and waste."

Valleys.—A lineal measurement on both sides of all open valleys to be given as " cutting and waste to sides of valleys (both sides measured)," if bedded and pointed to be so stated. Where valley tiles are used a lineal measurement to be given as " extra to valley tiles to suit pitches of roof, including cutting and waste and bonding on both sides."

Hips and Angle Tiles.—A lineal measurement on both sides of all hips where coverings are to be used to be given as " cutting and waste to hips (both sides measured)." A lineal measurement of all mitred hips to be given as " extra to cut and mitred hips, and including cutting and waste on both sides," and if pointed to be so described. Where, in the place of coverings, hip tiles (or angle tiles for vertical tiling) are used, a lineal measurement to be given as " extra to hip tiles to suit pitches of roof (or angle tiles for vertical tiling) including cutting and waste and bonding on both sides."

Ridge Tiles.—A lineal measurement of ridges with description to be given, and all cut or splayed ends separately given. All mitres, intersections, special made tiles and finials to be numbered and fully described.

INSTITUTION OF MUNICIPAL ENGINEERS.

A VISIT of the Institution of Municipal Engineers was made on Saturday last to the Surrey Commercial Dock, under the conduct of Mr. J. Davies, of the *Timber News*. The visit lasted some two hours. A variety of woods were inspected, and their respective merits and demerits clearly explained and demonstrated by Mr. Davies. The visit was a most interesting and a most instructive one, and those who were present look forward to the further visit which Mr. Davies has promised to pioneer to inspect the harder varieties of wood. These could not be seen on Saturday, as they are stacked in docks removed some distance from the Surrey Commercial. A unanimous vote of thanks was passed to Mr. Davies on the conclusion of the proceedings.

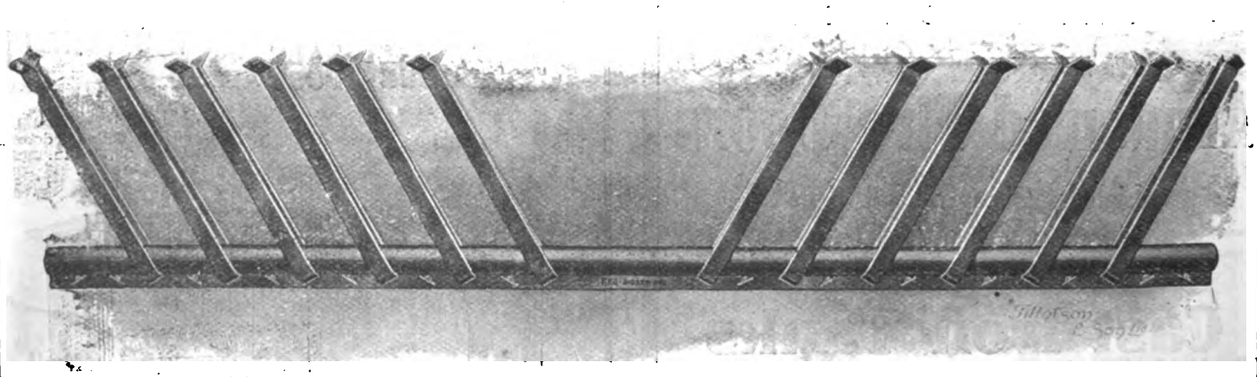
The following are brief " notes " of the points conveyed by Mr. Davies during the tour of inspection, and they will be found of more than usual value, owing to the fact that much of the information conveyed is not to be found in the ordinary text-book.

Red or Yellow Fir or Deal.—Commonly termed " red " in the North and Midlands, and " yellow " in the South. A European wood, quite distinct from yellow pine or red pine, both of which are American woods. The staple building wood. Used for both joinery and carcassing or constructional work. Strong, durable, and economical in conversion, but not obtainable without some measure of defect, in the form of shakes, sap, and knots. Exported from Russia, Sweden, and Norway. Best shipments are from Archangel, Petersburg, Gefle, Sandarne, and Hudikswall. Archangel and Petersburg wood is hammer-stamped on the ends by shippers. Swedish and Norwegian are marked in coloured paints. The white paint figures seen on ends are dock company's marks, referring to size, name of ship, and rotation number of voyage, and have no bearing on quality. Once imported in logs, but now in sawn planks, deals, and battens, and planed and unplaned boards.

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White Fir or Deal.—Exported from same districts as red or yellow deal. Not quite so durable as yellow, but well adapted for interior fittings, &c., where a plain, cheap wood, without figure, will do. Used for small buildings in the North and Midlands, but rarely or never for contract constructional work. Largely cut up into packing-case stuff. Sapwood is not easily distinguishable from heart. Does not shake or crack so readily as yellow.

Yellow Pine.—The mildest and cleanest of the American pines. Never used for stress bearing work, but excellent for joinery. Remains very sound in seasoning and does not warp. It is prized, therefore, for engineers' pattern making. Best qualities very free from sap and knots. Easily distinguished by its soft mild grain, its even yellow colour, and the tiny dark hair-like marks which are visible in abundance on planed surfaces. Imported from Canada and Newfoundland in sawn planks, deals, and boards. Best shipments are from Quebec and Montreal. Sometimes shipped in the log.

Red Pine.—A sound, durable building wood, adapted for both joinery and carcassing. Very similar in appearance and quality to red or yellow deal or fir. Shipped from Canada in planks, deals, and boards.

Pitch Pine.—Next to red fir, the most largely used wood for engineers and builders. Strong, tough, and durable. Imported from south-eastern United States in logs, planks, deals, and boards. The staple wood for large scantlings in roof timbers, &c., having superseded the now almost extinct shipments of red fir logs from Memel, Dantzic, and Riga. Where sizes required are less than 4 inches by 12 inches, however, it offers no advantages over red fir or deal, which is available in numerous dimensions, ready sawn, within that limit. Very useful for joinery, being obtainable in clear sound boards up to 12 inches and 14 inches wide. Has good figure, giving bold effect at moderate cost.

Oregon or British Columbian Pine (Douglas Fir).—A very useful carpenters' and joiners' wood, closely resembling pitch pine. Shipped from British Columbia and the State of Oregon. The same wood, in spite of difference in title. Very free from sap, and can be obtained by selection equally free from knots. Shipments include a few very wide ringed or spongy planks and logs of doubtful durability; but when these are removed the remainder can be used without hesitation for all purposes where red fir or pitch pine would do. Imported in logs and large sawn planks, the latter ranging up to 8 inches thick and 18 inches wide, giving great economy in conversion. Is receiving increasing recognition from architects.

White Spruce.—Closely resembling European white fir or deal, both in appearance and behaviour under the tool. Not regarded as a building timber, except for small and cheap buildings in the North and Midlands. The better qualities are very clean and sound, showing smooth, silky surface when planed. Useful for interior fittings, oars, sculls, &c. Imported in sawn planks and deals from Canada. Best shipments are from Quebec and Montreal.

Larch.—A very tough, durable building wood, imported from the White Sea district of Russia in logs and sawn planks, deals, and boards. Hard to work, but strong. Not unduly sappy or knotty. Can be used anywhere as a substitute for red fir, pitch pine, or Oregon pine in constructional work. Has marked yellow or bilious tint. In appearance something between red or yellow deal and pitch pine. Largely grown in England for telegraph poles. Smaller sizes used for fencing, farm buildings, &c.

THE electric lighting committee of Edinburgh Town Council have ordered to be printed a preliminary report by Sir Alexander Kennedy as to the future working of Dewar Place and M'Donald Road power stations, with special reference to the provision of cooling towers. The scheme for Dewar Place may cost 45,000*l.*, and includes the provision of two exhaust turbines and towers.

THE water committee of the Birmingham Corporation report that the subject of the risk of damage to the Elan Valley works by lightning has from time to time engaged their attention, and in view of the possible serious effects of electrical explosion in the heart of the dams, they considered it prudent to seek expert advice on the subject. Sir Oliver Lodge was consulted, and he, after an inspection of the works, recommended the adoption of certain protective measures, the details of which have been worked out by Mr. Macaulay, the Elan supply resident engineer, in conference with Sir Oliver Lodge, and the work has been put in hand, the estimate being 770*l.* for the whole of the works.

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A HOUSING AND TOWN-PLANNING CONFERENCE.

A conference on the practical administration of the town-planning clauses of the Housing and Town-Planning Act will be held on Tuesday, December 14, at 10 a.m., and Wednesday, December 15, at the Westminster Palace Hotel, London, S.W., under the auspices of the National Housing and Town-Planning Council.

The Council in their circular say that as both Houses of Parliament are now in agreement in regard to the Housing and Town-Planning Bill, they are calling together the postponed conference on town-planning procedure. The principles of town planning were adequately dealt with at the National Town-Planning Congress held in August last, and as copies of the valuable papers read at this Congress will be sent to every representative appointed to attend the coming conference, there will be no need to cover this ground again. It is recognised that the best form for the conference to take will be the full and careful discussion of the subject by the representatives themselves.

The Council propose to place before the Congress as the basis for discussion a series of suggestions as to the most practical lines of town-planning procedure adapted to (*a*) great centres of population; (*b*) urban districts.

The following gentlemen have been invited to co-operate in the preparation of this series of suggestions:—

Professor S. D. Adshead, Professor of Town Planning, Liverpool University; Mr. John H. Barlow, Bourneville Village Trust; Professor Berlepsch-Valendas, Munich; Mr. Albert E. Cave, London; Professor Eberstadt, Berlin; Professor Fuchs, Tubingen; Professor Patrick Geddes, Edinburgh; Ober-Baurat Geusen, Düsseldorf; Mr. E. M. Gibbs, F.R.I.B.A., Sheffield; Mr. T. C. Horsfall, Manchester; Mr. Percy B. Houfton, architect, Woodlands Colliery Village; Mr. T. H. Mawson, Windermere; Beigordneter Rehorst, Cologne; M. Augustin Rey, Paris; Mr. B. Seebohm Rowntree, Earswick Village Trust; Mr. Raymond Unwin, Hampstead Garden Suburb; Oberbürgermeister Wagner, Ulm; Mr. Percy Scott Worthington, F.R.I.B.A., Manchester.

The suggestions of these gentlemen will take the form of a skeleton plan setting forth the best course for a local authority to take in the administration of the new Act. These suggestions will be printed and placed before the representatives at the meeting.

Before the close of the conference arrangements will be made for the formation of a town-planning advisory committee, in accordance with the following resolution of the Congress held in August last:—

"This Congress approves the appointment of a special town-planning advisory committee for the purpose of carefully watching the framing of the methods of procedure and the administration of the Housing and Town-Planning Bill when it is passed into law.

"It suggests that, in addition to representatives of the National Housing Reform Council, each county, city, borough and local council and society subscribing to the Council, or which has sent representatives to this Congress, appoint a representative on the committee. It also desires to ask the foreign delegates present to give the benefit of their experience and advice for the assistance of the proposed committee.

"It further suggests that the committee so formed should be requested to appoint sub-committees for dealing with the various details of organisation and procedure, and shall include a special sub-committee for Scotland."

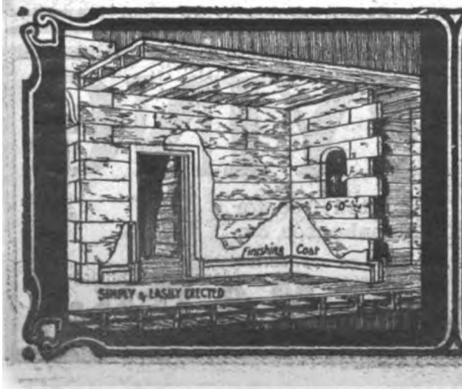
The gentlemen named above are being asked to act as members of this advisory committee, and to give this committee the benefit of their skilled advice. This town-planning advisory committee will, it is trusted, be of service in answering questions and publishing papers and plans relative to town-planning schemes, and especially schemes in other countries.

An abstract giving the clauses of the new Act, and describing their scope, will be sent to all the representatives in the week preceding the Conference.

A detailed statement of the actual procedure adopted by German cities will also be placed before the Conference, and arrangements will be made for a number of the most valuable town plans of Germany and France to be exhibited and explained.

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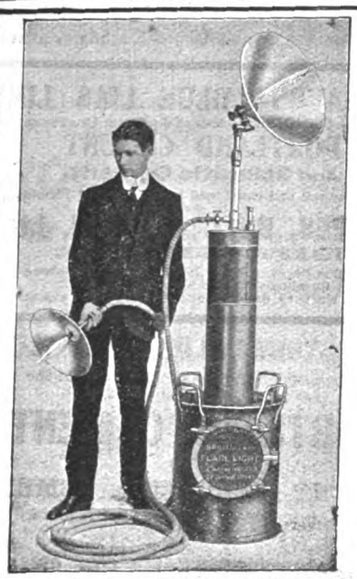
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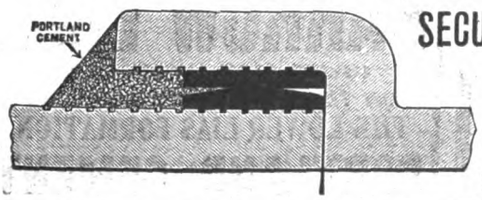
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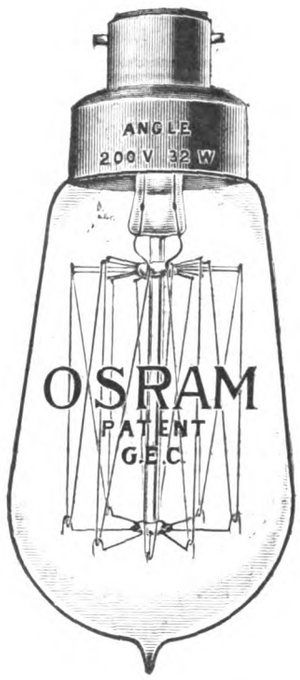
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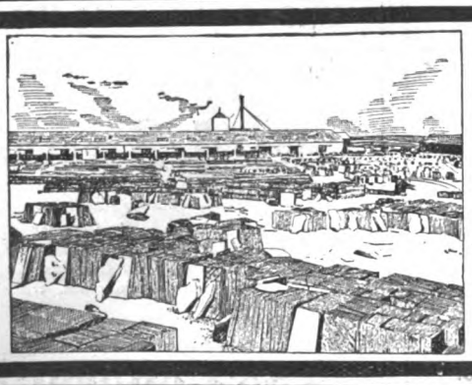
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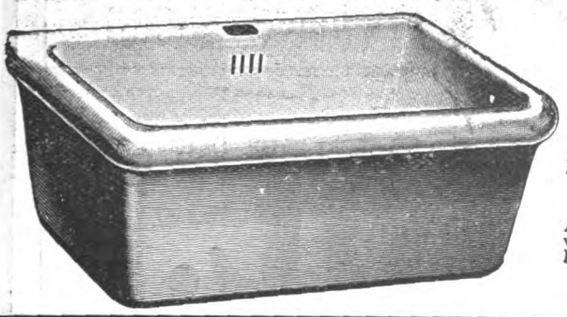
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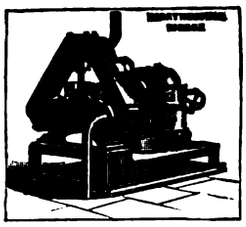
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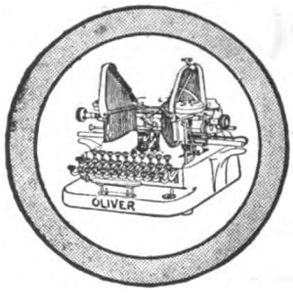
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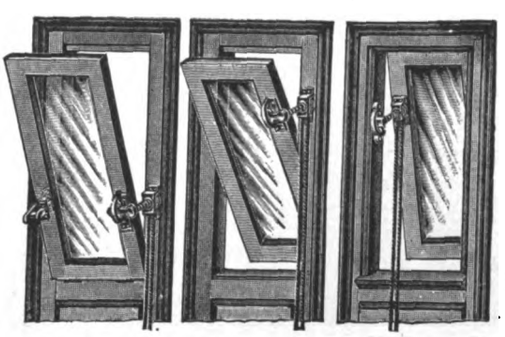
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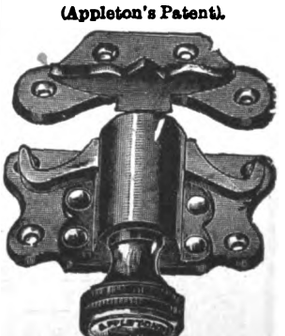
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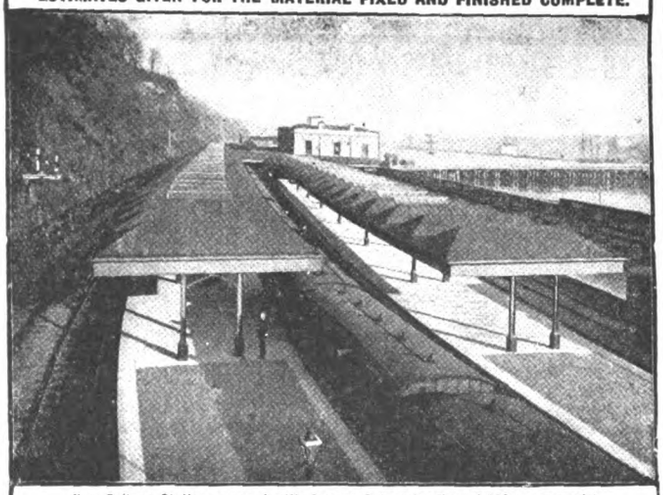
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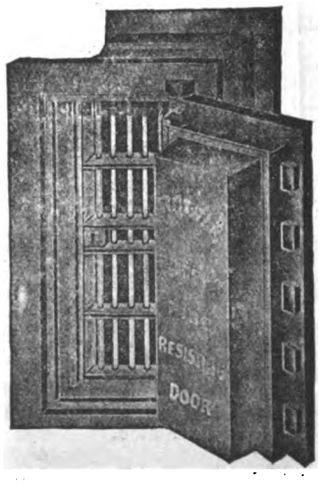
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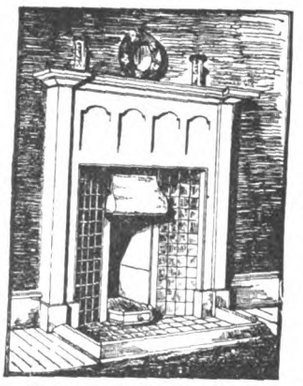
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THE

Architect and Contract Reporter.

FRIDAY, DEC. 10, 1909.

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EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

COMPETITIONS OPEN.

HETTON.—Jan. 1.—The committee of the Working Men's Club invite plans for the erection of a new club. Mr. James Widdowfield, Secretary, Hetton Working Men's Club, Pemberton Street, Hetton-le-Hole.

LARNE.—Jan. 1.—For a technical school proposed to be erected in Victoria Street. A premium of 21*l.* will be paid for the approved design. Mr. Thomas Clearkin, Secretary, Technical Instruction Committee, Larne.

LEEDS.—Dec. 18.—The education committee invite architects practising in Leeds to submit designs for proposed training college for teachers, Kirkstall Grange, Far Headingley. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist the committee. Deposit 2*l.* 2*s.* Mr. James Graham, Secretary for Education, Education Department, Leeds.

OLDHAM.—Feb. 1.—The Town Council invite competitive designs from architects practising or residing within the borough for an extension of the town hall. Premiums of 50*l.*, 30*l.*, and 20*l.* are offered, together with 5*l.* for every competitor who carries out the instructions. Apply to Mr. E. C. Foote, borough surveyor, Oldham, Lancs.

SOUTHEND-ON-SEA.—Dec. 31.—For a new Council school. Competition is limited to architects practising in the borough. Mr. J. W. Barrow, Education Offices, Southend-on-Sea.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

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CONTRACTS OPEN.

Ashbourne.—For erection of six cottages on the Wirksworth Road, Ashbourne, Derbyshire. Messrs. Naylor & Sale, architects, Smith's Bank Chambers, Market Place, Derby.

Barnet.—Dec. 13.—The Guardians of Barnet Union invite alternative tenders for the construction of a water tower having a capacity of 60,000 gallons, as follows:—(1) For a tower having a steel or cast-iron tank, the framing of the tower being formed of steel or of cast-iron columns; (2) for a tower and tank formed entirely of reinforced concrete. Deposit 2*l*. Mr. J. C. Melliss, M.I.C.E., 264 Gresham House, Old Broad Street, London, E.C.

Barnsley.—Dec. 20.—For erection of a public elementary school on site off Grove Street. Deposit 2*l*. 2*s*. Mr. E. W. Dyson, architect, Regent Street, Barnsley.

Bedford.—Jan. 7.—For the erection of certain buildings in connection with a proposed refuse destructor for the borough, together with the construction of approach roads, paved areas, formation of site, erection of a manager's cottage, and other works. Deposit 3*l*. 3*s*. Major Hector Tulloch, C.B., R.E., engineer, 28 Victoria Street, London, S.W.

Birkenhead.—Dec. 23.—For construction and erection of a block of buildings for the carburetted water-gas plant, comprising a boiler house with tall chimney, machinery house, steel framed generator house and annexe filled in with brickwork, and a meter house, together with other works, at the gas works, Thomas Street, Birkenhead. Deposit 3*l*. 3*s*. Mr. T. O. Paterson, M.I.C.E., gas works, Thomas Street, Birkenhead.

Blackburn.—Dec. 13.—For erection of police station, sessions court, &c., on Blakey Moor (basement and lower ground floor section). Deposit 1*l*. 1*s*. Send names at once to Messrs. Briggs, Wolstenholme & Thornley, and Messrs. Stones & Stones, joint architects, Richmond Terrace, Blackburn.

Bridlington.—Dec. 13.—For proposed alterations and additions to business premises at 5 Quay Road. Mr. Joseph Shepherdson, architect, 8 Quay Road, Bridlington.

Bridlington.—Dec. 15.—For erection and completion of a dwelling house in Marine Drive. Mr. Joseph Shepherdson, architect, 8 Quay Road, Bridlington.

Brighton.—Dec. 20.—For erection of a day training college in Richmond Terrace. Deposit 3*l*. 3*s*. Messrs. T. Simpson & Son, surveyors to the committee, 16 Ship Street, Brighton.

Bury.—Dec. 28.—For erection of an elementary school in Elton, Bury, Lancs., for the Corporation. Deposit 1*l*. The Director of Education, 8 Bank Street, Bury.

Cartmel.—Dec. 13.—For alterations and additions to Broughton Hall, Cartmel, near Ulverston. Messrs. J. W. Grundy & Son, architects and surveyors, Central Buildings, Ulverston.

Camborne.—Dec. 13.—For reseating the gallery with sundry alterations and painting the Wesleyan Methodist Church at Camborne, Cornwall. Mr. Sampson Hill, architect, Green Lane, Redruth.

Chadderton (Lancs.).—Dec. 22.—For the erection of a refuse destructor in connection with existing buildings and inclined roadway at the Sewage Disposal Works, Middleton Junction. Deposit 2*l*. The Surveyor to the Council, Town Hall, Chadderton.

Churwell.—Dec. 13.—For the painters and grainers' work required in completion of eight houses. The Churwell Industrial Co-operative Society, Ltd., Churwell, Yorks.

Cradley.—Dec. 31.—For erection of a Council elementary school, and for the enlargement of existing schools, in Colley Lane, Cradley, Worcestershire. Deposit 2*l*. 2*s*. Apply by Dec. 11 to the County Education Office, Worcester.

Crewe.—Jan. 8.—For new training college for teachers to be erected at Crewe, for the County Education Committee. Deposit 2*l*. Mr. H. Beswick, F.R.I.B.A., county architect, Newsgate Street, Chester.

Disley.—For the erection of a school at Disley, Cheshire. Deposit 1*l*. 1*s*. Forward names at once to Messrs. S. Butterworth & Duncan, F.R.I.B.A., 4 South Parade, Rochdale.

Elland.—Dec. 11.—For the joiner, slater, plasterer, and plumber work required for four houses at Woodside, Elland, Yorks. Mr. Fred F. Beaumont, architect, Southgate Chambers, Halifax.

Farnworth.—Dec. 20.—For erection of boiler house, cook house, bakehouse, stores and workshops at the workhouse, Fishpool, Farnworth, near Bolton. Deposit 5*l*. Mr. Samuel Coope, F.S.I., 24 Mawdsley Street, Bolton.

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FOLKESTONE.—Dec. 28.—For works in connection with the extension of the public library on Grace Hill. Deposit 1*l.* 1*s.* The Borough Surveyor's office, Church Street.

HALIFAX.—Dec. 23.—For the execution of the mason, joiner, plumber, and slater's work required in connection with the alterations and repairs to a warehouse in Wade Street, for the electricity committee. Deposit 1*l.* Mr. James Lord, M.I.C.E., borough engineer, Town Hall, Halifax.

HULL.—For small brick-built convenience at East Park. City Engineer, Town Hall, Hull.

HULL.—Dec. 13.—Whole tenders for the alteration and additions to Wawne Street school. Deposit 2*l.* 2*s.* Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

IRELAND.—Dec. 13.—For new roof and wood ceiling at the Clifton Street Presbyterian church, Belfast; also for alterations to the schoolhouse. Deposit 1*l.* 1*s.* Messrs. Young & Mackenzie, architects, Scottish Provident Buildings, Belfast.

IRELAND.—Dec. 16.—For building thirty-two single labourers' cottages, and for the fencing of the plots, for the Clones Rural District Council. The works are to be completed within six months after they have been laid out by the architect, Mr. Joseph A. Geoghegan. Deposit 5*s.* The Clerk of the Rural District Council, Clones.

IRELAND.—Dec. 20.—For erection of additions to the Ferguson Memorial Schools, Belmont, near Belfast. Mr. Thomas Houston, architect, Kingscourt, Wellington Place, Belfast.

KIRKHAMGATE.—Dec. 13.—For alterations to porch at Kirkhamgate school, for the Stanley education sub-committee. Mr. Alexander Angus, 126 Northgate, Wakefield.

LANGHO.—Dec. 15.—For internal alterations to buildings at Langho Reformatory, Lancashire. Deposit 1*l.* Mr. Henry Littler, architect, 16 Ribblesdale Place, Preston.

LEEDS.—Dec. 15.—For alterations to and furnishing the offices, Nos. 38 to 46 Great George Street, for the property committee. Mr. W. T. Lancashire, city engineer, Municipal Buildings, Leeds.

LIVERPOOL.—Dec. 13.—For supply of office fittings, for the Toxteth Park Board of Guardians. Mr. R. Albert James, clerk, 15 High Park Street, Liverpool.

LONDON, S.W.—Dec. 13.—For sundry alterations and additions to existing buildings at their Battersea works, for the Metropolitan Water Board. The Offices of the Chief Engineer, Savoy Court, Strand, W.C. Deposit 5*l.* with the Accountant at Savoy Court, Strand, W.C.

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MANCHESTER.—Dec. 17.—For erection of wooden stone-breaking sheds in Tame Street, Ancoats. Deposit 10*s.* 6*d.* Mr. A. J. Murgatroyd, architect, 23 Strutt Street, Manchester.

MARGATE.—Jan. 4.—For the extension of the glass and iron shelter at Westbrook. Borough Surveyor, 13 Grosvenor Place, Margate.

MELKSHAM.—Dec. 16.—For erection of sanitary blocks at Lowbourne Council schools, Melksham, Wilts. The County Surveyor, County Offices, Trowbridge.

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PONTEFRACT.—Jan. 17.—For erection of a girls' high school in the Park. Deposit 2*l.* 2*s.* Send names by Dec. 15. Messrs. Tennant & Collins, architects, Ropergate, Pontefract.

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Scotland.—Dec. 21.—For the adaptation of the old Post Office, Market Street, Aberdeen, for a labour exchange. Deposit 1*l.* 1*s.* H.M. Office of Works, Parliament Square, Edinburgh.

Sheffield.—Dec. 17.—For pulling down and rebuilding front of premises, 34 Waingate. The City Architect, Town Hall, Sheffield.

Sheffield.—Dec. 21.—For the erection of new shed and stores at the Worthing Road depot for the health committee. The City Architect, Town Hall, Sheffield.

Skircoat.—Dec. 15.—For the following trades: Mason's, joiner's, plumber's and glazier's, plasterer's, stone slater's and concretor's required in erection of a detached house in Skircoat, Halifax. Messrs. Joseph F. Walsh, F.S.I., & Graham Nicholas, F.R.I.B.A., architects and surveyors, Museum Chambers, Halifax.

Stockton-on-Tees.—Dec. 15.—For alterations to Barrett Street property (old chapel), for the Guardians. Mr. John Rodham, 16 Finkle Street, Stockton.

Tipton.—For erection of a caretaker's house and outbuildings on land adjoining the public offices. Mr. Wm. H. Jukes, M.E., engineer and surveyor, Public Offices, Tipton, Staffs.

Tudhoe Grange.—Dec. 14.—For new Council school (for about 810 scholars) at Tudhoe Grange, Spennymoor. Mr. W. Rushworth, Shirehall, Durham.

Wales.—Dec. 13.—For erection of two additional classrooms and other work at the Abercarn Council school, Monmouthshire. Deposit 1*l.* 1*s.* Mr. John Bain, architect, County Council Offices, Newport.

Wales.—Dec. 13.—For erection of proposed "Garth Rest" for consumptives, Pentyrch, near Cardiff. Deposit 2*l.* 2*s.* Mr. John H. James, M.S.A., architect, Taff's Well, Cardiff.

Wales.—Dec. 14.—For the improvement and enlargement of the Bangor Normal Training College. Send names by December 14 to Mr. Rowland Lloyd Jones, M.S.A., Market Street, Carnarvon.

Wales.—Dec. 15.—For proposed additions and alterations to premises in Penygraig Road, Penygraig. Mr. W. Lewis, secretary to the Penygraig and District Labour and Progressive Club.

Wales.—Dec. 18.—For the erection of a Welsh Congregational chapel at Penrhos, near Ystradgynlais. Messrs. C. S. Thomas, Meagher & Jones, architects, 15 Wind Street, Swansea.

Wales.—Dec. 20.—For alterations and additions to 17 Castle Street, Cardiff. Mr. W. H. Dashwood Caple, F.R.I.B.A., 2 Church Street, Cardiff.

Wales.—Dec. 20.—For erection of the tower, chancel, and vestries at Christ Church, Radyr, near Cardiff. Mr. Geo. E. Halliday, F.R.I.B.A., 19 Castle Street, Cardiff.

Wales.—Dec. 23.—For the extension of the Blaentillery mixed school, for the Abertillery Urban District Council. Deposit 1*l.* 1*s.* Mr. W. H. Hiley, architect, Chapel Street, Abertillery.

Wales.—Jan. 5.—For building additions to the County school at Llandovery, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., county architect, County Offices, Carmarthen.

Warrington.—Dec. 19.—For supply of two small sliding partitions, for the Education Committee. Mr. J. Moore Murray, secretary and director, Education Office, Warrington.

Warrington.—Dec. 30.—For erection and completion of two new swimming baths, new slipper baths, and sundry alterations to the Corporation baths. Deposit 2*l.* 2*s.* Mr. Thos. Longdin, borough engineer and surveyor.

Wednesbury.—Dec. 21.—For the enlargement of the post office. The Postmaster, Wednesbury.

Whitehaven.—Dec. 14.—For erection of stables, &c., adjoining the Grand Hotel. Messrs. J. S. Moffat & Bentley, architects, &c., 53 Church Street, Whitehaven.

Widnes.—Dec. 18.—For the erection of parochial buildings, Widnes, Lancs. Mr. Frank S. Biram, architect, George Street, St. Helens.

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TENDERS.

CASTLEFORD.

For shopfitter's work in connection with new branch premises, Vickers Street, for the Co-operative Industrial Society, Ltd. Mr. J. P. PADGETT, architect and surveyor, Castleford.

Sage & Co., Ltd.	£510 0 0
Curtis & Son, Ltd.	392 10 0
Todd Bros.	359 6 0
Mason & Son	347 0 0
T. Blakey	340 0 0
Cloughton	338 17 6
Wright & Sons	337 4 7
G. Blakey	315 4 9
Allinsons, Ltd.	300 0 0
HIRST & SONS, Castleford (*accepted*)	247 3 0

CREDITON.

For building a secondary school for girls, for the Haywards Education Authority. Mr. PERCY MORRIS, county architect (Education), Exeter.

Coats	£9,798 1 3
Berry	8,370 0 0
Goss	7,998 18 10
Davies & Sons	7,647 19 5
Blake	7,500 0 0
Bennet	7,175 18 7
Pickett	7,081 10 9
Pollard & Co.	6,950 18 0
Dart & Francis	6,947 2 3
Turpin	6,947 0 0
Coles	6,913 0 0
Wakeham Bros.	6,839 6 11
Westcott, Austin & White	6,750 0 0
Badcock	6,697 12 9
Pethick Bros.	6,572 0 0
Barnsley & Sons	6,514 0 0
Bryer, jun., Bridgwater (*recommended*)	6,500 7 6

COVENTRY.

For erection of new warehouse at Upper York Street. Messrs. TAIT & HERBERT, architects, Leicester and Coventry.

A.

Higgins	£2,649 0 0
Exor. of C. Garlick	2,425 0 0
Hancox	2,195 0 0
Wellerman Bros.	2,165 10 0
Elliott	2,137 10 0
GRAY (*accepted*)	2,037 0 0

B.

GRAY (*accepted*)	418 0 0

For erection of new pattern shop at Edgwick Works. Messrs. TAIT & HERBERT, architects, Leicester and Coventry.

Higgins	£789 0 0
Exor. of C. Garlick	784 0 0
Hancox	760 0 0
Elliott	748 10 0
Gray	743 0 0
WELLERMAN BROS. (*accepted*)	692 5 0

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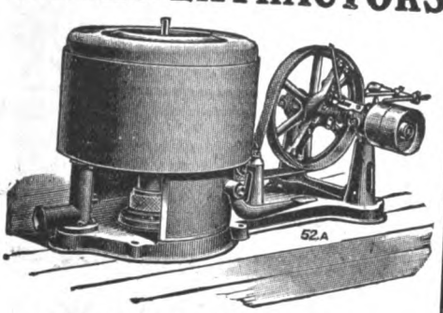
STENNING & SON (*accepted*)	143 7 9

ELLESMERE PORT.

For making and completing of Wilkinson Street for Ellesmere Port and Whitby Urban District Council. Mr. J. M. HUDSON, surveyor, 1 Lower Mersey Street, Ellesmere Port.

Fisher	£4,576 1 7
Woodland	1,800 0 0
Chadwick, Ltd.	1,081 16 6
Rennie & Thompson	1,014 11 0
Warren	995 2 8
Flather	943 5 0
STANDING, Garston, Liverpool (*accepted*)	894 0 0

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HEAVITREE.

For new Council school (Ladysmith Road) for 360 infants, including covered shed, tar paving, &c. Mr. Percy Morris, county architect (Education), Exeter.

Bovey & Sons	£4,465 0 0
Honour & Sons	4,443 9 9
Lapthorn & Co.	4,295 0 0
Ham & Passmore	4,048 15 9
A. N. Coles	3,961 12 2
Setter & Son	3,949 6 11
Westcott, Austin & White	3,599 0 0
W. G. Coles	3,575 6 7
Pethick Bros.	3,535 0 0
Stephens & Sons	3,534 9 2
Triggs	3,519 9 3
Pulman	3,498 17 8
Pollard & Co.	3,482 11 9
Wakeham Bros., Plymouth (*accepted*)	3,423 6 4

LONDON.

For preparing a model of the new county hall for the London County Council.

	¼-inch scale.	⅛-inch scale.
Carse	£2,310 0 0	£5,250 0 0
Cope & Furneaux	1,900 0 0	2,950 0 0
Thorp	750 0 0	1,000 0 0
Reynolds	550 0 0	590 0 0
Annan	549 0 0	549 0 0
Seale	485 0 0	566 0 0
Turner	380 0 0	570 0 0
Do. (alternative tender)	325 0 0	—
Mabey, 150a Vauxhall Bridge Road (*recommended*)	344 0 0	440 0 0

For laying 20-inch main from the Beachcroft reservoir to Peckham, for the Metropolitan Water Board.

Mowlem & Co.	£2,418 0 0
Docwra & Son	2,235 0 11
Manders	1,724 0 0
W. & C. French	1,695 0 0
Aird & Sons (*accepted*)	1,471 13 4

LONDON—*continued.*

For construction of the Southern low-level sewer No. 2, for the London County Council.

Fresh tenders.

Perry & Co.	£531,384 0 0
Muirhead & Co.	525,873 13 2
Westminster Construction Co.	513,900 0 0
Whyte & Co.	513 528 13 6
Mowlem & Co.	499,763 0 0
Neal	488,197 7 4
Bentley & Son	483,612 19 11
Griffiths & Co., London Wall, E.C. (*recommended*)	481,553 9 11
Chief Engineer's estimate	489,500 0 0

For the covering with asbestos tape of various high and low tension cables used in connection with the London County Council's tramways.

Henley's Telegraph Works Co.	£2,737 10 0
Blackwell & Co., Ltd.	2,510 8 4
British Insulated and Helsby Cables	2,465 0 0
Vauxhall Engineering Co.	2,096 15 5
Callender's Cable and Construction Co.	1,978 6 8
Siemens Bros. & Co.	1,817 18 4
Western Electric Co.	1,520 10 5
Johnson & Phillips, Ltd., Charlton (*recommended*)	1,241 11 3
Estimate of Chief Officer of Tramways	2,000 0 0

For enclosing, tar-paving, and draining the additional land, building offices for the boys and completing other work left unfinished in connection with the structural improvement of the Pritchard's Road School, Bethnal Green, N.E., for the London County Council.

Perry & Co. (Bow), Ltd.	£872 0 0
Thorne	853 7 3
Appleby & Sons	840 0 0
Johnson & Co.	723 0 0
Kirk & Randall	712 0 0
Leng	697 0 0
Symes, Stratford (*recommended*)	687 0 0
Architect's (Education) estimate	718 0 0





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LONDON—*continued.*

For erection of a storehouse at Battersea, for the Metropolitan Water Board.

Smith & Co.	£5,963	1	8
Reason	5,952	17	0
Coles	5,660	0	0
Monk	5,373	0	0
British Fireproof Construction Co.	5,170	0	0
Clifton	5,165	0	0
Foster & Dicksee	5,098	0	0
Webster & Son	5,064	0	0
Shurmur & Sons	4,986	0	0
Roberts & Co.	4,955	0	0
Lovatt	4,903	17	6
F. & H. F. Higgs	4,880	0	0
E. Lawrence & Sons	4,816	0	0
Smith & Sons	4,795	0	0
Renshaw	4,795	0	0
Higgs & Hill	4,794	0	0
Carmichael	4,703	0	0
Fryer & Co.	4,698	0	0
Neath	4,662	14	10
Dick, Kerr & Co.	4,630	0	0
Spencer, Santo & Co.	4,618	18	0
Mowlem & Co.	4,590	0	0
Kirk & Randall	4,581	0	0
Gray	4,569	0	0
W. Lawrence & Son	4,554	0	0
Garrett & Son	4,499	0	0
Perry & Co.	4,489	0	0
Holloway Bros.	4,475	0	0
Nightingale	4,424	0	0
Aird & Sons	4,393	1	10
Nicholds & Reynolds	4,243	0	0
PATTINSON & SONS (*accepted*)	3,997	0	0

LONGWORTH.

For alterations and additions to Longworth House, Berks. Messrs. R. ENGLAND & SON, architects, Oxford.

Parnell & Son	£4,858	0	0
Estcourt & Sons	4,670	0	0
Kingerlee & Sons	4,467	0	0
HUTCHINGS & SONS, Oxford (*accepted*)	3,980	0	0

MARCH (CAMBS.).

For erection of grammar school buildings and alterations to the school house situate on the Station Road. Messrs. J. G. STALLEBRASS & SONS, architects, Peterborough and March.

Freeman	£3,915	0	0
Whye	3,832	8	4
Moss	3,821	0	0
Cracknell	3,817	0	0
Rands	3,723	5	0
Redhead	3,682	0	0
Papworth	3,621	6	0
Spragg	3,620	0	0
Christmas	3,585	10	0
Guttridge	3,582	0	0
Gray	3,550	12	2
Heath	3,530	10	0
Eggitt	3,511	3	0
Wilkinson	3,494	15	4
Bridgefoot	3,458	0	0
West	3,373	3	0
SHANKS, Chatteris (*accepted*)	3,235	0	0

MIDDLESBROUGH.

For additions and alterations to North Ormesby Hospital. Messrs. J. M. BOTTOMLEY, SON & WELLBURN, architects, Middlesbrough.

Petch	£2,503	9	0
Davison	2,482	13	0
Vinter & Davison	2,433	12	0
Robson & Sons	2,432	17	7
McNaughton	2,292	18	3
Radge	2,263	0	0
Allison Bros.	2,250	0	0
Rhodes	2,237	0	0
King & Sons, North Ormesby	2,234	0	0

NEWTON ABBOT.

For a mixed Council school for 240 children, at Wolborough. Mr. PERCY MORRIS, county architect (Education), Exeter.

Bovey & Sons, Torquay (*recommended*)	£2,825	0	0

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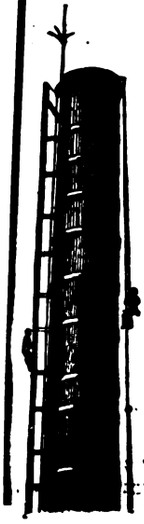

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PLYMSTOCK.

For new mixed Council school for 260 children, and cookery and manual training centre. Mr. Percy Morris, county architect (Education), Exeter.

Turpin	£4,767 0 0
Pearn Bros.	4,687 0 0
Stevenson	4,435 0 0
Pethick Bros.	4,224 0 0
Andrews	4,200 0 0
Miskin	4,162 19 5
Bartlett	4,117 0 0
Allen	4,030 4 2
Lapthorn & Co.	3,990 0 0
Drew	3,984 0 0
Crockerell	3,980 6 4
Bennett	3,889 13 6
Paynter	3,862 1 3
Tozer & Son	3,808 19 6
Endicott	3,797 1 10
Roberts	3,768 5 9
Wakeham Bros.	3,658 19 5
Stanbury	3,658 16 9
Williams, Holbeton (*accepted*)	3,613 8 10

ROMFORD.

For private street works for the Urban District Council.

Manders	£3,582 9 5
Fry Bros.	3,417 11 0
Griffiths & Co., Ltd.	3,355 0 8
Jackson	3,099 0 0
Glenny	3,057 7 8
Wilson, Border & Co.	3,044 18 11
Parsons & Parsons	2,984 12 2
Free & Sons, Ltd., Maidenhead (*accepted*)	2,976 15 9
Surveyor's estimate	3,001 15 10

TEIGNMOUTH.

For erection of a school, Exeter Road, for 416 boys. Mr. Percy Morris, county architect (Education), Exeter.

Badcock, Ashburton (*accepted*)	£4,095 16 10

WALES.

For supply and delivery of approximately 970 tons of cast-iron pipes and specials from 24 inches to 3 inches in diameter, delivered in Llanelly, for the Urban District Council. Mr. Geo. Watkeys, engineer.

Cochrane & Co.	£6,170 5 2
Sheepbridge Coal and Iron Co.	5,835 18 8
Stewart & Co.	5,700 10 8
McFarlane, Strang & Co.	5,480 12 2
Holwell Iron Co.	5,227 11 7
Cochrane & Co. (Woodside)	5,135 13 2
Clay Cross Co.	5,116 15 10
Jordans	5,106 16 3
Oakes & Co.	5,085 19 5
Spittle & Co.	5,077 9 8
Staveley Coal and Iron Co.	5,042 4 9
Cloake	5,012 4 8
Stanton Iron Works Co., near Nottingham (*accepted*)	4,930 15 9

WEMBLEY.

For Council school at Blind Lane, Wembley, for the Middlesex County Council. Mr. H. G. Crothall, architect to the education committee.

J. & J. Bailey	£11,966 0 0
F. & H. Higgs	10,668 0 0
Fassnidge & Son	10,666 0 0
Kearley	10,294 0 0
Bollom	9,990 0 0
Tribe & Co.	9,953 0 0
Stewart	9,785 0 0
Neal	9,775 0 0
Dickens	9,700 0 0
Lacey	9,699 0 0
Knight & Son	9,495 0 0
Brand, Pettitt & Co.	9,476 0 0
Fairhead & Son	9,464 0 0
Treasure & Son	9,428 0 0
Batchelor	9,369 0 0
Lawrence & Son	9,292 0 0
Mattock Bros.	9,277 0 0
Haynes (*recommended*)	8,969 0 0

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CORDWAINERS' HALL.

THE new hall which is being built for the Cordwainers' Company at 7 Cannon Street, E.C., has a frontage to Cannon Street of 62 feet, and has a depth of 60 feet or thereabouts, and is the sixth hall built upon the same site, the first hall having been built in or about 1393.

The new building provides for an entrance to the hall premises at the western end of the site, leaving the rest of the frontage to Cannon Street, by a depth of over 30 feet, for letting purposes on the ground and basement floors. This part of the premises will be self-contained and quite distinct from the rest of the premises to be occupied by the Company.

The entrance hall is octagonal on plan, and is to be finished in marble, and leads to an inner hall, from which the main staircase ascends to the upper floors. At the foot of this staircase cloak-room provision has been made, and an electric lift provided to serve throughout the premises.

The mezzanine floor will contain a suite of offices for the use of the clerk of the Company, a large committee room, and also an office for the beadle. The first floor will contain the court room and the court reception room, while on the second floor the large hall is situated. This hall will be 60 feet in length by 32 feet wide and 23 feet high. On the top floor accommodation is provided for the beadle and a kitchen to serve the large hall.

The front elevation is treated in English form of the Renaissance, with very little ornamentation. The front is dealt with in two heights, the lower being rusticated and containing two floors, the ground and mezzanine, and the upper portion containing the court rooms and hall, where an Ionic order is used, running through the two floors and terminating with an open balustrade. The entrance doorway is to be executed in grey polished Aberdeen granite.

The whole of the premises are being built with fireproof construction and will be heated with low-pressure hot water throughout.

The builders for the works are Messrs. Ashby & Horner, of 8 Aldgate, E. Mr. W. Crossley is acting as the clerk of works, and the building is being carried out from the designs prepared by the company's surveyor, Mr. H. Chatfeild Clarke, F.R.I.B.A., of 63 Bishopsgate Street Within, E.C., under whose personal supervision the works are being executed.

TRADE NOTES.

UNDER the direction of Mr. J. Turner, surveyor, the "Boyle" system of natural ventilation embracing the latest patent "air-pump" ventilators and air inlets, has been applied to the town hall, Matlock.

THE tower of the parish church, Dartford, Kent, is being restored and a new clock with chimes is being erected. It will have two 6-foot illuminated dials, play the Westminster chimes on four bells and strike the hours on the largest bell in the tower. The tender of Messrs. John Smith & Sons, Midland Clock Works, Derby, has been accepted.

THE municipal authorities of Antwerp invite tenders for the supply and fitting of shower baths in the municipal buildings in the Rue des Prédicateurs and the Rue de la Ferme at Antwerp. The cost of the work is estimated at about 946*l.*

MESSRS. E. H. SHORLAND & BROTHER, the Manchester Stove Works, Failsworth, Manchester, are carrying out the following works:—The Empire Theatre, West Hartlepool, is being ventilated by means of their patent exhaust roof ventilators and special inlet ventilators. The extensions to the Wallsend and Willington Quay fever hospital are being warmed and ventilated by means of double-fronted patent Manchester stoves with descending smoke flues and patent Manchester grates. The additions to Haines Hospital, Ramsgate, are being warmed and ventilated by means of patent Manchester grates and ventilators. The smallpox hospital, Redbourn, is being warmed and ventilated by means of patent Manchester grates.

THE Metropolitan Electric Supply Company have opened new show rooms at 15 Porchester Road, Bayswater. The decorative scheme has been carried out under the direction of Mr. A. W. Neal (the inventor of "Coatostone"), of 77 Mortimer Street, W. The decorations are simple and effective, as harmony of the delicate colours has been studied; the ceiling is finished in ivory white, the frieze in cream "Coatostone," the wall panels in mauve "Coatostone," and styles and rails and cornice in ivory white finished egg shell gloss. The front portion of shop walls is in "Coatostone" imitating ashlar work of Bath stone with dental cornice and panelled soffits with fluted Greek columns and ornamental caps and bases.

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VARIETIES.

THE Wolverhampton Corporation have applied for the 15,000*l.* required for extensions to their electricity works and mains.

THE Birmingham Building Trades' Exchange and Club, Ltd., had their first annual dinner at the Imperial Hotel on the 2nd inst. The club has now a membership of 250.

AT Folkestone more building plans were passed during November than in any previous month of 1909. The number of empty houses has decreased by over one hundred since last year.

THE Torquay Corporation are going to promote a provisional order to empower them to proceed with schemes for the simultaneous erection of new municipal buildings, a town hall and a pavilion.

THE King's Norton Urban Council have decided to make application to the Local Government Board for permission to borrow 26,600*l.*, to cover the cost of the erection of the Grove Road school and alterations to the King's Heath and Silver Street schools.

THE Stone Urban District Council have approved the plans submitted by Mr. Commin, the Council's engineer, for new sewage disposal works and refuse destructor at an estimated cost of 8,193*l.* The work will be proceeded with as soon as the necessary authority is given.

MR. C. F. WIKE, the city engineer for Sheffield reports that in the last year the number of new houses certified for occupation was 1,723. It is estimated that there are now 106,135 houses in Sheffield, of which 52,425 have been built under the by-laws since 1864..

A SPECIAL meeting of the Matlock Bath District Council was held on Saturday to consider tenders for the erection of a kursaal and pumproom, to complete the 50,000*l.* improvement scheme sanctioned by Act of Parliament. After an hour's consideration, in camera, the press were informed there had been about a score of tenders received, and the Council had chosen that of Messrs. W. Ford & Sons, of Derby, at the sum of 8,694*l.*, the buildings, &c., to be erected and completed in seven months.

THE Paisley Dean of Guild Court last week passed the following plans:—James Cochrane, wine and spirit merchant, to erect shops at the corner of Canal Street and Stow Place; J. & J. M'Callum, dyers, to construct a new warehouse at the works at Laighpark; Wilson & Co., joiners, to erect a tenement of dwelling-houses at Barterholm Street; Brown & Polson, starch manufacturers, to re-erect the buildings which were recently destroyed by fire at Carriagehill; Thomas Stevenson, builder, to form a new street between Clark Street and Greenhill Road.

THE electrical engineer to the Horsham Urban Council reports that there is a considerable amount of amateur electric wiring going on in the town in the way of extensions to existing installations. The work is done without notice to him, and therefore is never tested, and there is the possibility that a meter may be burnt out through having too much load upon it. This work is usually carried out with the cheapest of materials and in utter disregard of the Council's wiring rules, so that although the Council could not be blamed if a fire occurred, the undertaking would suffer from the scare that would be caused. In consequence the electrical engineer has been authorised to insist on the Council's regulations as to notice and wiring being complied with, and in case of non-compliance, to exercise his power of cutting off the supply.

EXCEPTIONAL facilities are offered by the Great Eastern Railway Company's British Royal Mail Harwich-Hook of Holland route for visiting Holland and Germany during the Christmas holidays. Passengers leaving London in the evening, and the northern and midland counties in the afternoon arrive at the principal towns in Holland the following morning, Cologne at noon, Berlin, Dresden and Bale in the evening. Tickets at reduced fares will be issued to Brussels via Harwich and Antwerp, December 21, 22, 23, 24 and 27, available for eight days. Tickets dated to suit the convenience of passengers can be obtained at the Continental Inquiry or booking offices Liverpool Street station. The Danish Royal Mail steamers of the Forenede Line of Copenhagen will leave Harwich for Esbjerg in connection with express trains to Copenhagen, on Thursday, December 23, and Saturday, 25th; returning Tuesday 28th and Wednesday 29th. The General Steam Navigation Company's steamers will leave Harwich for Hamburg Wednesday, December 22, and Saturday, 25th; returning Wednesday, 29th.



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ILLUSTRATIONS.

QUENBY HALL, LEICESTERSHIRE.

BANK AT MIDDLETON, LANCS.

NEW CHURCH OF ST. MICHAEL, SUNNYSIDE, BERKHAMSTED.

COMPETITION DESIGN FOR ADDITIONS TO TOWN HALL, STOKE-UPON-TRENT.

A CASE OF LIBEL.

THE Lord Chief Justice, sitting with a special jury in the King's Bench Division on Monday, heard an action for damages for libel brought by Mr. Sidney Robert James Smith, F.R.I.B.A., against Mr. W. I. Dowle, a surveyor.

Mr. Walter Frampton, counsel for the plaintiff, said the defendant was not represented nor was he present in court; in fact he believed that he had left the country and taken with him all his belongings. He would ask the jury to take that into consideration after they had heard all the facts of the case. It appeared that in 1903-4 Messrs. Jennings and Messrs. Doulton successfully tendered for the reconstruction of drainage in the Elder Road Schools and Brook Street Infirmary, in the Lambeth district, and Mr. Smith was appointed by the Lambeth Board of Guardians as architect. Defendant was in the employ of Messrs. Jennings as a work supervisor, and was dismissed from his employ because of his having committed certain irregularities, which had, however, nothing to do with the case. The libel complained of was contained in a letter which the defendant wrote to Mr. A. F. Collins, a member of the Lambeth Board of Guardians, four years after the contracts were completed. It was as follows, having been written from Dover:—

"Dear Sir,—Knowing you as ex-Chairman of the Lambeth Guardians, and noticing in the *Builder* that the firm of Jennings were the lowest tendering in competition for some sanitary works at Wincott Street Casual Wards, it occurred to me as a very suspicious circumstance knowing as I do that for every public work in competition for the last eighteen months they have been highest every time in their tender, and perhaps the same conclusion might occur to you when I have related the circumstances of the last contracts with your Board at Elder Road Schools and Brook Street Infirmary. I do not know if the same architect as you employed then is still on your list, for if so he will go out of his way to do anything for Jennings. At Elder Road and Brook Street the architect and surveyors each took 100*l.* from Jennings, and the clerks of works also shut their eyes and received bribes from the same source. Jennings systematically robbed the Board in the following manner with the assistance of the architect, surveyors and clerks of works:—(1) By measuring and charging for materials never supplied or used; (2) by gross overcharges on every item not scheduled; (3) by falsification of their weekly day work sheets, and by irregular procedure in these same sheets being allowed to leave the works before being scrutinised and passed by the proper authority, the clerk of works. I am in a position to know that by these methods they received more than 1,200*l.* at the school works than they were entitled to; also when the Brook Street works were tendered for, Jennings were the only firm invited by the architect to give an estimate for the work and fittings, and the same methods of increasing their day work sheets by the assistance of the clerk of works was maintained throughout. At Elder Road School, on a schedule form of contract, you will find the day work allowed by the architect and surveyors amounted to nearly 25 per cent. of the whole of the amount you paid the contractors for the work they carried out for you. This, I am sure from my knowledge of the contract business, is most unusual, and if your architect and staff had done their duty to your Board those charges could have been limited to a very small proportion of the whole."

That letter, said counsel, meant to convey that Mr. Smith had failed to efficiently discharge his duties to the Guardians, and that he had acted dishonourably, unprofessionally, and corruptly in his office. As there was no foundation whatever for such allegations, Mr. Smith wished for a judgment which would put him right in the eyes of any who had heard of the libel and the charges it contained. Counsel added that the other persons concerned in the letter had instructed their solicitors, but the allegations against them had been withdrawn by the defendant.

Mr. Smith, in the witness box, said he had been architect for the Tate Gallery, the National Gallery, the Cripplegate Institute, and many other public places. He absolutely

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denied that there was any truth in the allegations made by the defendant.

His Lordship then addressed the jury, remarking that there was nothing worse in the present day than a libel of that sort to injure the character and reputation of a professional man. Defendant had put in no plea of justification, but had apparently left the country, so that there being no doubt as to the falsity of the libels for which there was absolutely no foundation, all the jury had to do was to assess the amount of damages which the plaintiff should receive to compensate him for the pain and trouble he had been put to by its publication.

The jury awarded the plaintiff 100*l.* damages, and his Lordship entered judgment for that amount, with costs.

HOT-WATER SUPPLY SERVICE INSTALLATIONS.

A dispute recently arose in connection with the erection of the new Masonic Hall, Leicester, to which allusion was made in our issue of November 12. It may be remembered that the plumbers claimed the monopoly of pipe-fitting and fixing work in all metals (whether lead or not). After protracted delay the plumbers agreed to join in an application to the Board of Trade to appoint an arbitrator to hear and determine the question of dispute between the parties. Alderman T. Smith, J.P., was appointed to act as arbitrator, and heard the case in Leicester on November 5 and 6, the parties represented being Messrs. Ashwell & Nesbit, Ltd., the heating and domestic engineering contractors; the Masters' National Association and the Operatives' National Union connected with this trade on one side, and the plumbers' section of the Leicester and District Building Trades Employers' Association and the United Operative Plumbers' Association (Leicester District) on the other side.

At the termination of the proceedings the arbitrator reserved his award.

The decision of Alderman T. Smith, J.P., has now been issued and is as follows:—

"I decide that no claim has been established giving to plumbers the exclusive right to fit and fix all pipes and fittings in hard metals used in connection with ventilation, heating, warming, laundry, cooking, and general hot and cold-water, domestic (or other) supplies or services.

"I therefore award and determine that, in the water area of the Leicester Corporation, the demarcation of work shall be as follows:—

(*a*) "All lead work in connection with hot- and cold-water domestic (or other) supplies or services shall be plumbers' work.

"All domestic waste, soil or ventilating pipes above ground from w.c.'s, baths, lavatories, sinks, or other sanitary conveniences or appliances, shall be plumbers' work.

(*b*) "All other work in connection with ventilation, heating, warming, laundry, cooking and general hot- and cold-water domestic (or other) supplies or services, in which iron, brass, copper, or other similar hard metal is used, may be done either by hot-water, heating and ventilating engineers, fitters, or by plumbers, as may be provided in plans or schemes prepared by hot-water, heating and ventilating engineers, or by master plumbers, or others."

This completely vindicates the right of the heating and domestic engineers to do the work in question and establishes what they have maintained all along, viz., "That all lead work be considered plumbers' work, but that a neutral line be taken as regards all iron, brass, copper, or other metal work, which may be executed by engineers or plumbers." The plumbers' contention that, irrespective of the metal used, the work is theirs and theirs alone, to the exclusion of any other trade, is entirely set aside and disposed of.

MUNICIPAL AND HEALTH EXHIBITION.

A meeting of the Advisory Council of the Municipal and Health Exhibition, 1910, was held on Wednesday, the 1st inst., at the Holborn Restaurant. The chairman of the council (Professor Henry Adams, M.Inst.C.E.) presided, and there was a representative attendance of local government officers and the heads of manufacturing firms.

Mr. F. W. Bridges, organiser of the exhibition, stated that since the last meeting a good deal had taken place, and he had the satisfaction of telling them that on the Honorary Advisory Council they now had 120 gentlemen from all parts of the country, principally municipal engineers and sur-

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veyors, &c. The first exhibition, last year, gave an idea of what a municipal exhibition should be and what it could do. The interest taken in the movement was widespread, and for that reason the committee work must largely be in the hands of those nearer London, but every member would be informed periodically of all that was taking place, and cousulted upon any difficulties which might arise. Among the numerous offers of assistance received he was glad to announce a letter from Mr. G. L. Gomme, the clerk to the L.C.C., who said that if his experience would be of any use they could command him at any time. Mr. Bridges thought it was essential that they should keep well before them the dual object of the exhibition. On the one side it was to enable municipal engineers and other officials, and the councillors themselves who were responsible for the efficient municipal government of the country, to be kept *au fait* of everything that appertained to their respective departments, both as regards external and internal work. On the other side the great object of the exhibition was to educate the public as to what the municipal authorities were doing, as to what the money was wanted for.

It was decided to invite the President of the Local Government Board to consent to become president of the exhibition.

It was agreed to send a letter to all local authorities inviting their co-operation and asking them to send delegates, and that technical schools should be asked to submit specimens of the pupils' work.

Conferences and lectures are to be arranged for. Those in the afternoons will be of a more technical character, while popular lectures will be given in the evenings to interest the general public in matters pertaining to local government. The names of Professor Sylvanus Thompson and Mr. Sydney Webb were suggested.

The metropolitan boroughs are to be asked to grant facilities for delegates to visit public works and institutions—the Rowton Houses, Hampstead Garden Suburb, &c.

It was decided to ask the Lord Mayor of London to open the exhibition and to have a "Corporation Day."

In addition to the sections already announced, it was decided to include fire prevention, first aid and ambulance, physical training and ambulance.

APPRENTICESHIP AND TECHNICAL EDUCATION.

A CONFERENCE on "Industrial Education and Apprenticeship" was convened on Friday by the Lord Mayor at the Mansion House. The particular purpose was to discuss the question of industrial training in education and the development of trade schools, and in connection therewith (1) the position of apprenticeship and of the apprenticeship charities; and (2) the establishment or development of employment bureaus or other means of bringing those leaving school into touch with the industrial and commercial world. It was felt by the promoters that much good would be done by securing the sympathy of employers of labour and industrial associations in the work which the London County Council has undertaken in connection with the establishment of trade schools, into which are drafted boys and girls between the ages of thirteen and sixteen, for a course of training which, while not neglecting the educational side, has nevertheless a strong industrial bias.

The Lord Mayor in opening the proceedings said that it gave him great pleasure to preside at a meeting which was concerned with industrial education in London and apprenticeship. He took a particular interest in the subject of apprenticeship, and when he was asked to convene a meeting for that afternoon he at once assented. Owing to the large number of speakers, he said he would be forced to limit the speeches to seven minutes each.

Mr. Cyril Cobb, the vice-chairman of the London County Council education committee, said that before he dealt with his subject he wanted to thank the Lord Mayor for giving the education committee an opportunity of saying what they had on their minds. The great reason for the conference was the general unrest that was felt as to the tendency of our present educational system, and as to whether it was having the effect that people wished it to have. It was believed that England's commercial supremacy was threatened by the leading commercial nations of the Continent, and by the United States. The reason often put forward was that their education was on a better industrial and commercial basis and especially in the matter of those intermediate and provisional schools which form a link between the elementary school and the universities. Therefore the education committee and the nation wished to see how they stood. In the first place he









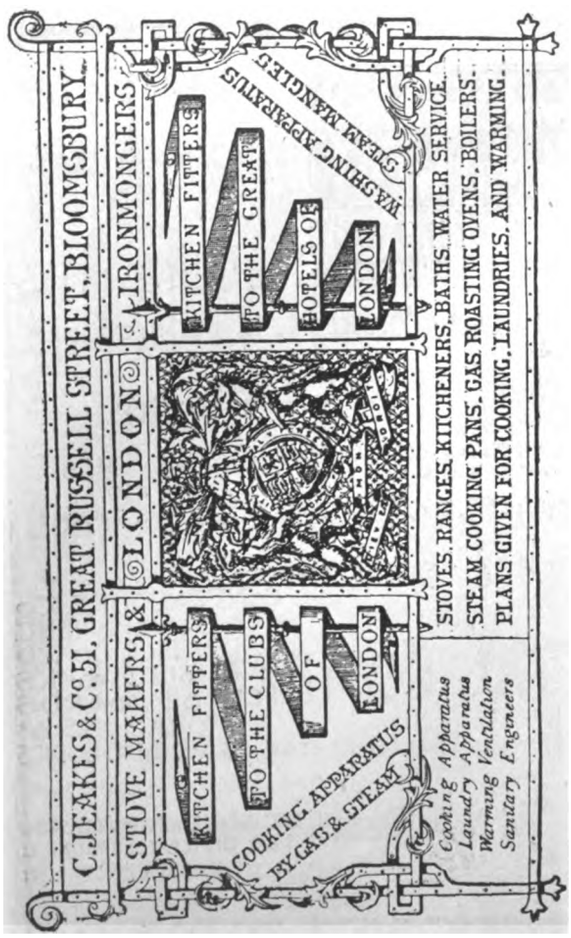
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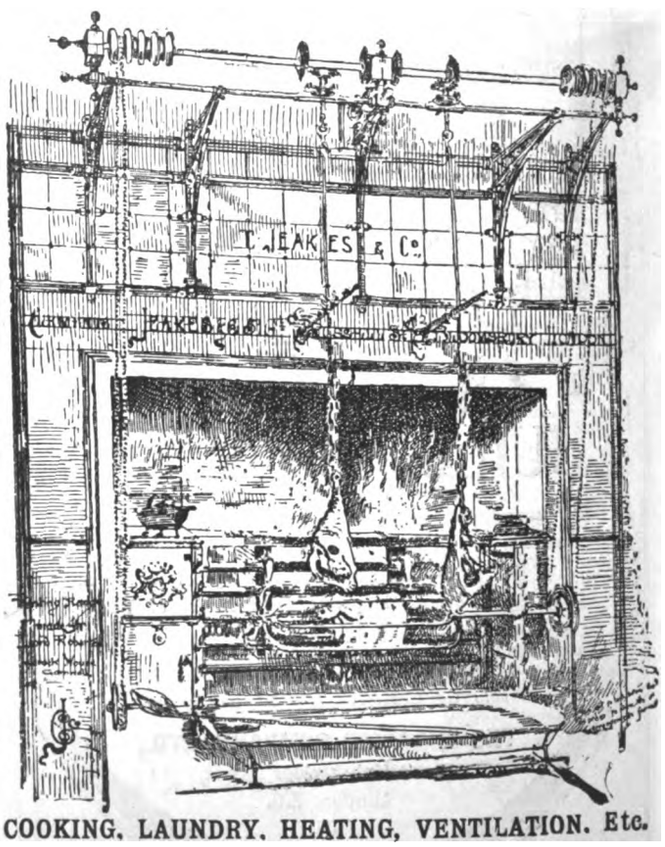
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would say that if they wished to reform they should make their education more practical. But there was a tendency to abuse rather unfairly our own system and to praise that of rival nations. While not falling into this error, he would say that there were some practical reforms which should be, and could be carried out. To arrive at the completest knowledge of what lines to go on, that meeting had been arranged so that the leaders in commerce, the leaders of labour, and of the trade unions should be brought together to discuss a common subject. The two main points to be considered were first the age when children were allowed to leave school, and secondly compulsory time off. In England compulsory education stopped at fourteen. The last Trade Union Congress recommended that the age should be raised to sixteen. On the other hand the Consultative Board of Education advocated compulsory half-time from fourteen to seventeen, coupled with voluntary time off which employers are supposed to give. Those were the two main alternatives. Another suggestion was that existing education should be supplemented by continuing it up to sixteen by evening classes. But this involved a danger of overtaxing the boy's strength. Compulsory time off was, in his opinion, not possible yet, but they might try to approach it gradually. The size of London and the distance the workers are from their employment would alone militate against it. Voluntary time off was a good thing provided that the boy was in a position to profit by it. The question that they had to consider was the kind of training that should be aimed at in the schools for the whole of the boy's time and more especially for the period after eleven years of age. From the employers' point of view there could be no doubt that the conditions had changed during the last quarter of a century, largely owing to the subdivision of industries, the effect of which was that a boy was only taught one little part of his trade. It was actually an advantage to the employer that his artisans should be engaged on one small division of his trade, even though they would never become accomplished tradesmen. The conditions under which apprenticeship had flourished were killed by the new order of things. In those days seven years was not considered too long for the training of a lad. From the workman's point of view the increase of boy labour and apprenticeship meant the overstocking of any particular trade. But that was a side of the subject that could not be discussed at that conference, but rather left for the individual trade unions to deal with, and afterwards to give the result of their investigations to the public. There was one point that ought to be emphasised, viz. the large number of boys who left school and ended by drifting into the unskilled trades. There was obviously under modern economic conditions not room for them all in the skilled trades, but it was a remarkable fact that the London skilled trades were largely recruited from the country, while the London boy never got his chance. What was wanted was so to educate the boys in elementary schools that they were equipped with a general practical adaptability to readily understand the nature both of commercial and industrial work, and that they should be skilled enough to turn from one side of their work to another. While not minimising the importance of a literary education, it must be granted by all that it was of no use unless it increased the intelligence of the child in all matters which should be brought to his intelligence.

Sir Thomas Wrightson, Bart., said that as an employer of labour he had been asked to speak on the subject of providing a technical education of such a kind that the scholars should not join the ranks of unskilled labour. He would therefore deal with a system that had been adopted in a large engineering establishment in the north of England with which he was connected, and which had been successful in creating among the boys a feeling of the greatest interest in their studies, and had produced among the parents a desire to place their sons under the regulations imposed. The number of men employed in the works was over 1,500, and their output was of the widest variety. The bound apprenticeship system, which did so much for the training of artisans before the present large factory system started, had lapsed almost entirely owing to the difficulty of enforcing discipline when the masters had not the power of dismissal. There was no need to go into the question of how the bound apprenticeship system had been discouraged; it was enough to recognise that such was the condition of affairs. Their problem was to establish a form of education which would replace the old system of education apprenticeship to a handicraft, which was the lineal descendant of the old trade guilds. The difficulties which confronted them were four in number, viz.:—(1) the



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apathy of parents; (2) the apathy of the employers; (3) the apathy of the trade unions; and (4) the apathy of the older workmen, who disliked working alongside the boys. With regard to the apathy of the parents this was due to the fact that they often preferred their boys to earn the higher wages of a labourer to the smaller wages of an apprentice. The employers were apathetic because after they had trained up the boys, these left just when they were becoming valuable, and probably joined an employer who had not taken the trouble to give any training to his boys. The trade unions were proved to be apathetic because of the fact that it was no longer an observed rule that an applicant must have the all-round training necessary for a skilled artisan. The apathy of the older workmen was really jealousy; and it was perhaps natural that they should be unwilling to give away what they considered to be the secrets of their craft to younger and more active men who might probably supersede them. In these days unless a boy obtained the mastery of more than one special operation in his trade his chance of employment was seriously diminished, for when he became a man his place was taken by another boy, and he was forced into the ranks of the casual labourer. In the engineering establishment of which he had spoken, they had tried three schemes during the past six years. For the first two years they tried to use the County Council schools, but the teaching did not answer, the interest of the boys was not aroused, and the attendance proved most unsatisfactory. It was next decided to send them to evening schools, and a drawing master was employed; but in this case the teaching was above the heads of the boys and there was a similar lack of interest. Their last scheme was to place the junior foreman in each department over the boys as teacher; as the junior foreman superintended their work during the day he was the best man to teach in the evening the theory of what they had done. This theoretical teaching could not be given during working hours; but knowing the exact work each boy was engaged in the junior foreman could readily give all the information that was necessary to make thinking artisans out of the boys. This scheme had proved most successful; the marked keenness of the attendance at the classes, and their attention was enabling the firm to turn out most promising young workmen. The standard of the technical teaching was not very high, but it was sufficient to draw out the best qualities of the boys. In some cases where a youth showed exceptional ability the firm, at their own expense, sent him to attend continuation schools where higher forms of theory were available. In their workshops there were of course machines of the greatest variety. Many of the boys who study in the evening after their long working hours were so keen that they stayed until ten and eleven o'clock. The boys were always being impressed to observe what was about them.

(To be concluded.)

AN L.C.C. MAIN DRAINAGE CONTRACT.

THE London County Council on July 6, 1909, received the undermentioned tenders for the construction of the southern low-level sewer No. 2 from Deptford to Battersea:—

Perry & Co. (Bow), Ltd., 56 Victoria Street, S.W.	£583,610 0 0
Price & Reeves, 17 Waterloo Place, S.W.	562,945 0 3
S. Pearson & Son, Ltd., 10 Victoria Street, S.W.	539,616 12 3
W. Scott & Middleton, Ltd., 98 Victoria Street, S.W.	527,037 16 0
W. Muirhead & Co., 35 Queen Victoria Street, E.C.	525,873 13 2
The Westminster Construction Co., Ltd., 22 Queen Anne's Gate, S.W.	514,000 0 0
John Mowlem & Co., Ltd., Grosvenor Wharf, S.W.	499,768 0 0
H. M. Nowell, Stockton-on-Tees	473,575 10 3
G. Shellabear & Son, 1 Mutley Plain, Plymouth	473,416 13 6

The chief engineer's estimate comparable with these tenders was 480,000*l.*

The main drainage committee recommended that an estimate of expenditure on capital account of 487,000*l.* should be approved, and that the tender of Messrs. G. Shellabear & Son should be accepted, but as this firm withdrew their tender, and as Mr. Nowell, the second lowest tenderer would not undertake the work unless he were allowed to increase the amount to 491,969*l.* 15*s.* 3*d.*, their chairman did not propose to move any of the recommendations then submitted, with

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Dublin—E. A. COOKE, 40 Belgrave Rd., Rathmines.
Belfast—JOHN McNEILL, Ocean Buildings.
Exeter—MITCHELL & SON, Palace Gate.
Glasgow—J. M. CARTMELL, 69 Buchanan Street.
Hull—A. E. PEARSON & SONS, 21 Myton Street.
Liverpool—JOHN S. RIGBY, 20 Castle Street.
Manchester—B. J. MILLER, Temple Chambers, 33 Brazenose Street.
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the exception of that approving the estimate of 487,000*l*. The Council, however, referred this recommendation back, and in October the committee recommended that fresh tenders should be invited for the work. The Council agreed to this recommendation, and at the same time authorised that the work be executed in sections.

After careful consideration, the committee decided that it would not be to the advantage of the Council to divide the work into sections. The principal reasons for coming to this decision were (i.) that owing to the fact that the greater part of the sewer will pass through water-bearing ground, and the construction will have to be carried out in cast iron with the aid of a shield in compressed air, special plant and appliances will be required, and it is obviously desirable that there should not be the unnecessary multiplication of this expensive plant which would result from the work being in the hands of more than one contractor; and (ii.) that if the work were divided, fresh specifications would have to be prepared, the bills of quantities would have to be split up and revised, and the contract drawings, &c., reproduced with the result that considerable expense would have to be incurred and much time would be lost. Fresh tenders were therefore invited on the same specification as on the previous occasion. These tenders have now been received and are as follows:—

Perry & Co. (Bow), Ltd., Victoria Street, S.W.	£531,384 0 0
W. Muirhead & Co., Queen Victoria Street, E.C.	525,783 13 2
Westminster Construction Co., Ltd., Queen Anne's Gate, S.W.	513,900 0 0
Whyte & Co., Ltd., Penarth	513,528 13 6
J. Mowlem & Co., Ltd., Grosvenor Wharf, S.W.	499,768 0 0
Robt. H. B. Neal, Ltd., Plymouth	488,197 7 4
E. Bentley & Son, Leicester	483,612 19 11
Griffiths & Co., Contractors, Ltd., London Wall, E.C.	481,553 9 11

The chief engineer's estimate comparable with these tenders is 489,500*l*. The first four tenders have been checked and arithmetical errors, if any, have been corrected.

The main drainage committee think that the lowest tender should be accepted. Their recommendation will be considered at the meeting next week.

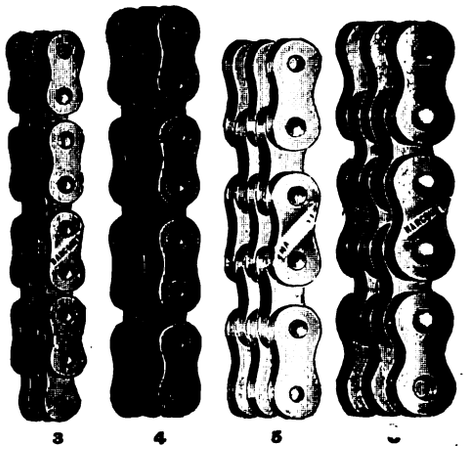
A clause has been inserted in the form of contract to provide that the contractor shall give preference in employment on casual or unskilled labour required for the work to men *bona fide* resident in the county of London.

The sewer, which will relieve the existing low-level sewer and diminish the possibility of floodings occurring in the low-lying districts through which it will pass, forms part of the scheme of main drainage extension approved generally on December 5, 1899, and when the work is put in hand the whole of the new sewers provided for in the scheme will either have been completed or be in course of construction. The contract time for the work is three years, and the expenditure will be divided approximately as follows:—Financial year 1909-10, 10,000*l*.; 1910-11, 150,000*l*.; 1911-12, 150,000*l*.; and the remainder in 1912-13.

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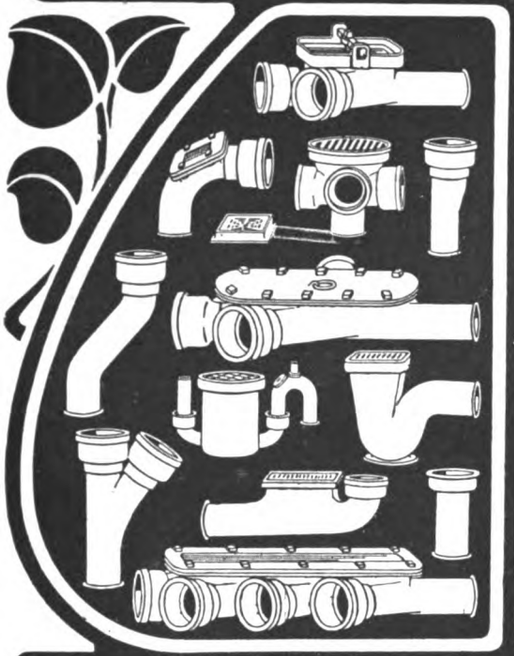
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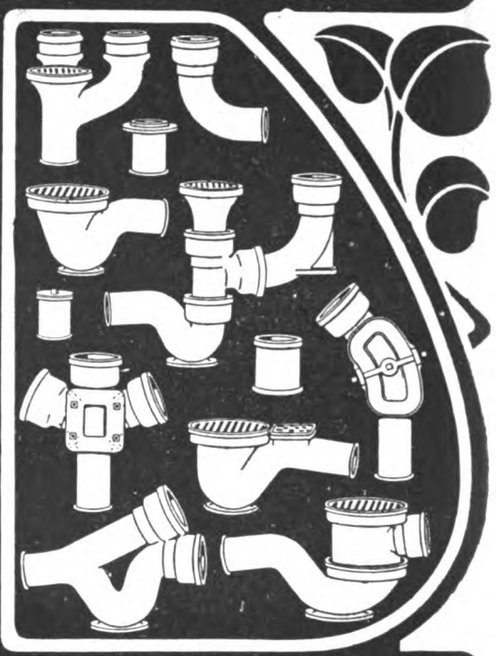
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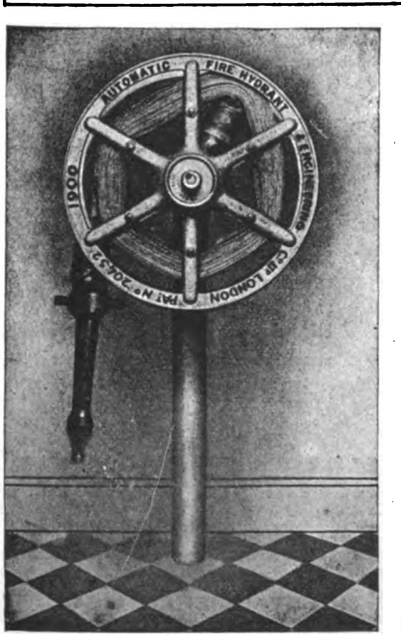
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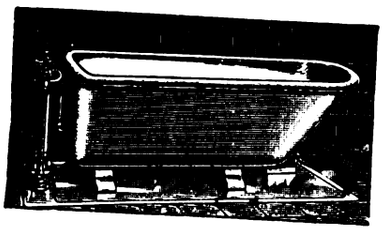
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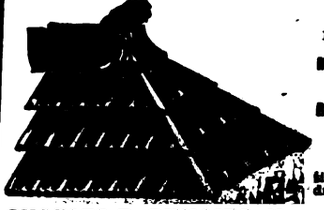
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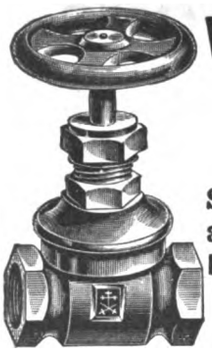
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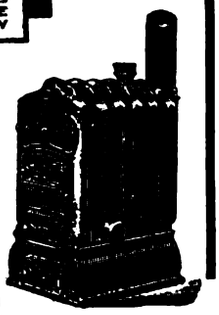


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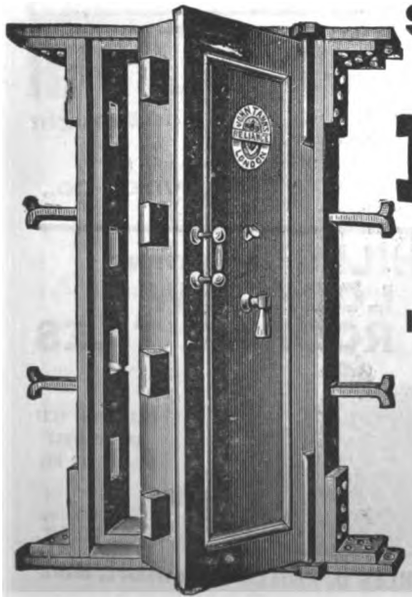
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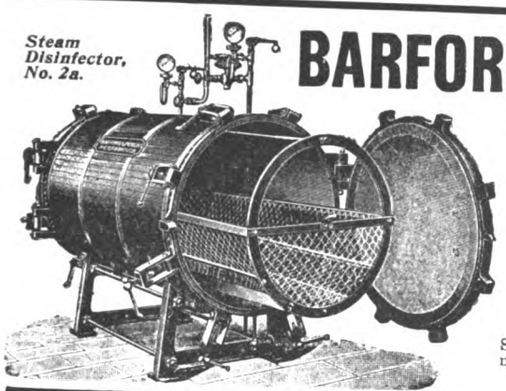
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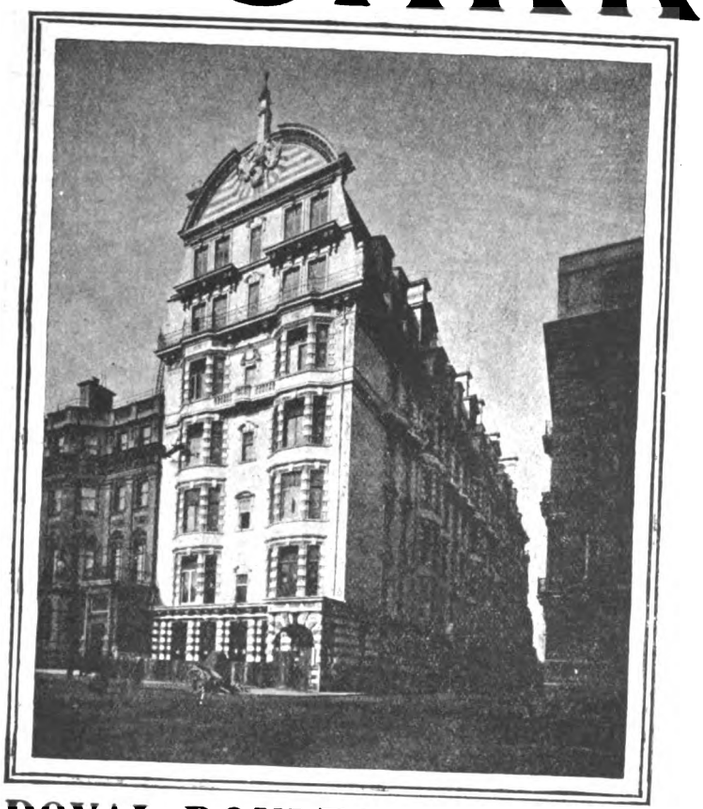
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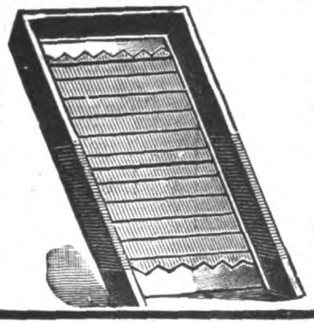
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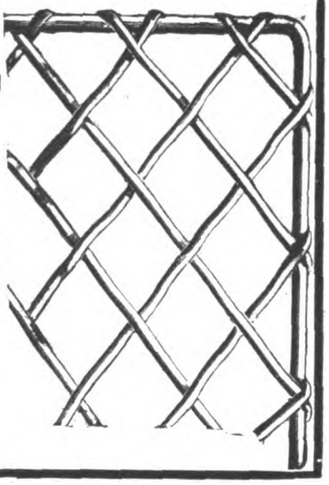
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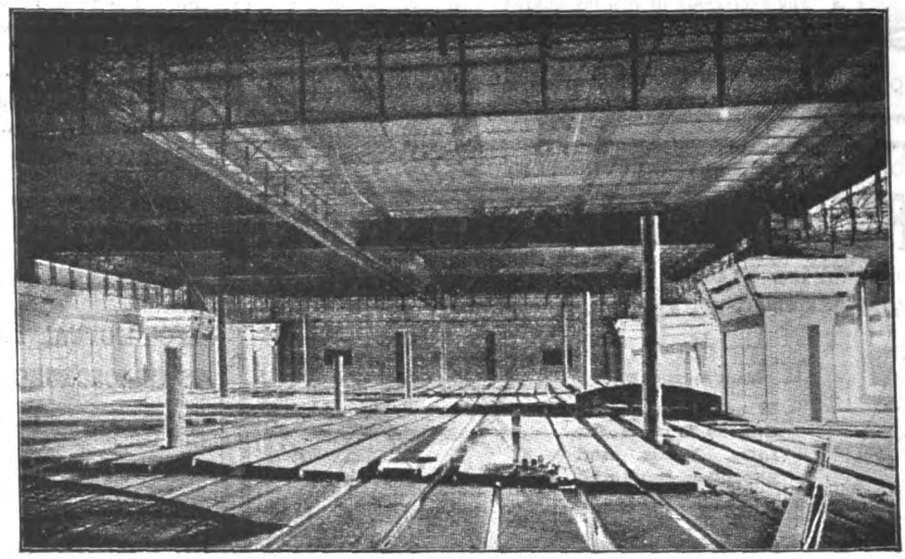
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BATH.—The Corporation invite designs for laying-out the Institution Gardens, Orange Grove, Bath. Premium of 50*l.* Further particulars in advertisement. Frederick D. Wardle, Town Clerk, Guildhall, Bath.

HETTON.—Jan. 1.—The committee of the Working Men's Club invite plans for the erection of a new club. Mr. James Widdowfield, Secretary, Hetton Working Men's Club, Pemberton Street, Hetton-le-Hole.

LARNE.—Jan. 1.—For a technical school proposed to be erected in Victoria Street. A premium of 21*l.* will be paid for the approved design. Mr. Thomas Clearkin, Secretary, Technical Instruction Committee, Larne.

LEEDS.—Dec. 18.—The education committee invite architects practising in Leeds to submit designs for proposed training college for teachers, Kirkstall Grange, Far Headingley. Sir Aston Webb, C.B., R.A., F.R.I.B.A., has been appointed to assist the committee. Deposit 2*l.* 2*s.* Mr. James Graham, Secretary for Education, Education Department, Leeds.

LEEDS.—Jan. 1.—The Directors of the Leeds Co-operative Society, Ltd., invite designs for new business premises and offices. Premiums of 100*l.*, 50*l.*, and 25*l.* for designs placed first, second, and third by assessor. Conditions and lithographed plans on application to Secretary on receipt of stamped addressed foolscap envelope with deposit, 2*l.* 2*s.* Further particulars in advertisement. Secretary, John W. Fawcett, 10 Albion Street, Leeds.

OLDHAM.—Feb. 1.—The Town Council invite competitive designs from architects practising or residing within the borough for an extension of the town hall. Premiums of 50*l.*, 30*l.*, and 20*l.* are offered, together with 5*l.* for every competitor who carries out the instructions. Apply to Mr. E. C. Foote, borough surveyor, Oldham, Lancs.

SOUTHAMPTON.—Jan. 27.—The Corporation invite plans from local architects for a pavilion on the Common. Premiums of 10*l.* and 5*l.* Mr. R. R. Linthorne, town clerk, Municipal Offices, Southampton.

SOUTHEND-ON-SEA.—Dec. 31.—For a new Council school. Competition is limited to architects practising in the borough. Mr. J. W. Barrow, Education Offices, Southend-on-Sea.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.



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CONTRACTS OPEN.

Ashby-de-la-Zouch.—Jan. 1.—For erection of an elementary school, together with out-offices, drainage, and other works connected therewith. Mr. John Day, architect, 8 New Street, Leicester.

Barrow-in-Furness.—Dec. 18.—For construction of a store in the basement of Rawlinson Street schools. Borough Engineer's office.

Barnsley.—Dec. 20.—For erection of a public elementary school on site off Grove Street. Deposit 2*l.* 2*s.* Mr. E. W. Dyson, architect, Regent Street, Barnsley.

Bedford.—Jan. 7.—For the erection of certain buildings in connection with a proposed refuse destructor for the borough, together with the construction of approach roads, paved areas, formation of site, erection of a manager's cottage, and other works. Deposit 3*l.* 3*s.* Major Hector Tulloch, C.B., R.E., engineer, 28 Victoria Street, London, S.W.

Birkenhead.—Dec. 23.—For construction and erection of a block of buildings for the carburetted water-gas plant, comprising a boiler house with tall chimney, machinery house, steel framed generator house and annexe filled in with brickwork, and a meter house, together with other works, at the gas works, Thomas Street, Birkenhead. Deposit 3*l.* 3*s.* Mr. T. O. Paterson, M.I.C.E., gas works, Thomas Street, Birkenhead.

Bridlington.—Dec. 21.—For taking down and re-building No. 4 Queen Street. Mr. J. Earnshaw, architect, Carlton House, Bridlington.

Brighton.—Dec. 20.—For erection of a day training college in Richmond Terrace. Deposit 3*l.* 3*s.* Messrs. T. Simpson & Son, surveyors to the committee, 16 Ship Street, Brighton.

Bitton.—Dec. 30.—For the formation of playgrounds and erection of boundary walls at Bitton Council School, near Bristol. Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester.

Bury.—Dec. 28.—For erection of an elementary school in Elton, Bury, Lancs., for the Corporation. Deposit 1*l.* The Director of Education, 8 Bank Street, Bury.

Carn Brea.—Dec. 21.—For erection and completion of three houses at Carnarthen Farm, near Carn Brea Station, Cornwall. Mr. Sampson Hill, architect, Green Lane, Redruth.

Chadderton (Lancs.).—Dec. 22.—For the erection of a refuse destructor in connection with existing buildings and inclined roadway at the Sewage Disposal Works, Middleton Junction. Deposit 2*l.* The Surveyor to the Council, Town Hall, Chadderton.

Crewe.—Jan. 8.—For new training college for teachers to be erected at Crewe, for the County Education Committee. Deposit 2*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newsgate Street, Chester.

Farnworth.—Dec. 20.—For erection of boiler house, cook house, bakehouse, stores and workshops at the workhouse, Fishpool, Farnworth, near Bolton. Deposit 5*l.* Mr. Samuel Coope, F.S.I., 24 Mawdsley Street, Bolton.

Folkestone.—Dec. 28.—For works in connection with the extension of the public library on Grace Hill. Deposit 1*l.* 1*s.* The Borough Surveyor's office, Church Street.

Halifax.—Dec. 23.—For the execution of the mason, joiner, plumber, and slater's work required in connection with the alterations and repairs to a warehouse in Wade Street, for the electricity committee. Deposit 1*l.* Mr. James Lord, M.I.C.E., borough engineer, Town Hall, Halifax.

Hensingham.—Dec. 22.—For alterations and additions to 127 to 129 Main Street, Hensingham, Cumberland. Mr. Jacob Glaister, architect, 48 High Church Street, Whitehaven.

Ireland.—Dec. 20.—For erection of additions to the Ferguson Memorial Schools, Belmont, near Belfast. Mr. Thomas Houston, architect, Kingscourt, Wellington Place, Belfast.

Keighley.—Dec. 18.—For the erection of residence in Woodville Road. Send names to Messrs. W. H. & A. Sugden, architects, North Street, Keighley.

Macclesfield.—Jan. 18.—For erection of a detached villa for private patients at the Parkside Asylum. Deposit 2*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Chester.

Macclesfield.—Dec. 20.—For the following, for the Guardians, viz.:—(1) Erection of the new bakery, bathhouse, and lavatories, &c.; (2) for providing and fixing bakery plant,



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machinery, and oven. Messrs. Whittaker & Bradburn, architects, 19 King Edward Street, Macclesfield.

MAIDENHEAD.—Dec. 20.- For repairs at Leopold House, Grenfell Road, for the Guardians. Mr. William Weed, clerk, Queen Street Chambers, Maidenhead.

MARGATE.—Jan. 4.—For the extension of the glass and iron shelter at Westbrook. Borough Surveyor, 13 Grosvenor Place, Margate.

MARRICK.—Jan. 8.—For pulling down and re-erecting a dwelling house at Marrick, near Reeth, Swaledale, Yorks. Mr. Frank Martin, architect, 2 Prebend Row, Darlington.

NEWTON ABBOT.—Dec. 30.—For erection and completion of the following works, for the Urban District Council, viz.:—(*a*) Boundary walls, gates, and railings, &c.; contract No. 1. (*b*) Sexton's lodge, store, &c.; contract No. 2. (*c*) Mortuary chapel; contract No. 3; at the new cemetery, Wolborough. Deposit 2*l*. 2*s*. each set of quantities. The Surveyor's Office, Town Hall, Newton Abbot.

OKEHAMPTON.—Jan. 17.—For new higher elementary school for 120 children, with laboratory, cooking, and manual training rooms, at Okehampton, Devon. Deposit 1*l*. 1*s*. The County Architect (education), 1 Richmond Road, Exeter.

OXFORD.—Jan. 3.—For erection of a boys' and girls' school in Thames Street, St. Aldate's, and for additions and alterations to certain existing buildings intended to form an infants' school in Luther Street. Deposit 2*l*. 2*s*. The City Estates Surveyor, Town Hall, Oxford.

SCOTLAND.—Dec. 21.—For the mason, joiner, slater, plumber, plaster, and glazier and painter works of a new academy building to be erected at Wallace Hall, Closeburn, for the School Board. Messrs. James Barbour & Bowie, architects, Dumfries.

SCOTLAND.—Dec. 21.—For the adaptation of the old Post Office, Market Street, Aberdeen, for a labour exchange. Deposit 1*l*. 1*s*. H.M. Office of Works, Parliament Square, Edinburgh.

SHEFFIELD.—Dec. 21.—For the erection of new shed and stores at the Worthing Road depot for the health committee. The City Architect, Town Hall, Sheffield.

SKIRCOAT.—Dec. 22.—For the following trades:—Mason's, joiner's, plumber's and glazier's, plasterer's, stone slater's, and concretor's required in erection of a detached house at Skircoat, Halifax. Messrs. Joseph F. Walsh, F.S.I., & Graham Nicholas, F.R.I.B.A., architects and surveyors, Museum Chambers, Halifax.

SOUTH MOOR.—Dec. 21.—For new outbuildings, yards, street formation, sewerage, &c., to 100 houses at South Moor, Durham. Deposit 1*l*. 1*s*. Mr. J. William Rounthwaite, A.R.I.B.A., architect, 13 Mosley Street, Newcastle-on-Tyne.

TRURO.—Jan. 15.—For erection of County Council offices. Deposit 2*l*. 2*s*. Apply by Dec. 17 to Messrs. Silcock & Reay, architects, 47 Milsom Street, Bath.

WALES.—Dec. 20.—For alterations and additions to 17 Castle Street, Cardiff. Mr. W. H. Dashwood Caple, F.R.I.B.A., 2 Church Street, Cardiff.

WALES.—Dec. 20.—For erection of the tower, chancel, and vestries at Christ Church, Radyr, near Cardiff. Mr. Geo. E. Halliday, F.R.I.B.A., 19 Castle Street, Cardiff.

WALES.—Dec. 23.—For the extension of the Blaentillery mixed school, for the Abertillery Urban District Council. Deposit 1*l*. 1*s*. Mr. W. H. Hiley, architect, Chapel Street, Abertillery.

WALES.—Dec. 23.—For erection of temporary dormitories, &c., at the Union Workhouse, Merthyr Tydfil. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

WALES.—Jan. 5.—For erection of a pair of cottage homes for children at Abercwmboi, Aberdare. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

WALES.—Jan. 5.—For building additions to the County school at Llandovery, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., county architect, County Offices, Carmarthen.

WALES.—Jan. 7.—For erection of an infants' school for 350 places at Cefn Coed, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor, County Hall, Brecon.

WALES.—Jan. 7.—For erection of a mixed school for forty places at Dyffryn Crawnon, near Llangynidr, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor to the Breconshire Education Committee, County Hall, Brecon.

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For Index of Advertisers, see page X.

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Warrington.—Dec. 30.—For erection and completion of two new swimming baths, new slipper baths, and sundry alterations to the Corporation baths. Deposit 2*l.* 2*s.* Mr. Thos. Longdin, borough engineer and surveyor.

Wednesbury.—Dec. 21.—For the enlargement of the post office. The Postmaster, Wednesbury.

Winchester.—For erection of suggested swimming and other baths in Winchester. Mr. J. Ashton Sawyer, chartered surveyor, 59 High Street, Winchester.

Messrs. Horne & Co. state that in consequence of the demolition of the West End offices at No. 8 Delahay Street, under the Public Offices Sites (Extension) Act, 1908, they have removed to 35 Old Queen Street, Westminster, S.W.

Mr. H. R. Hooper, M.I.C.E., a Local Government Board Inspector, held an inquiry at the Guildhall, York, on the 3rd inst., into the application of the City Council for sanction to borrow 25,250*l.* for the construction of a new street from Pavement to Piccadilly, York. The scheme has been under discussion for a considerable time.

"Who's Who," with its supplementary publication of "Who's Who Year-book," is just about to be issued for the year 1910. This valuable work, which should be found in every well-regulated office, is becoming larger and bulkier every year, and the result has been that the compilers have been compelled to issue the Year-book as a separate publication. The editor, in a note, states that "in spite of the large number of reference books there is still need for one where the information can be seen literally at a glance and which includes not only the gist of information contained in many expensive publications, but some original tables to be found nowhere else." This claim of the editor's is fully maintained in the issue to hand, and with the two publications the business man has in his possession a work as desirable as the Post Office Directory. From the same publishers, Messrs. A. & C. Black, we have received two other important issues—the Englishwoman's Year-book and the Artist's and Writer's Year-book. The total outlay is 15*s.*—a very small cost for four volumes of valuable information.

TENDERS.

BARNET.

For alterations to the fire station.

Stewart	£652 0 0
Belton	547 10 0
Pearson & Son	492 15 0
Baughen	459 0 0
James, Hadley (*accepted*)	455 0 0

BROMLEY.

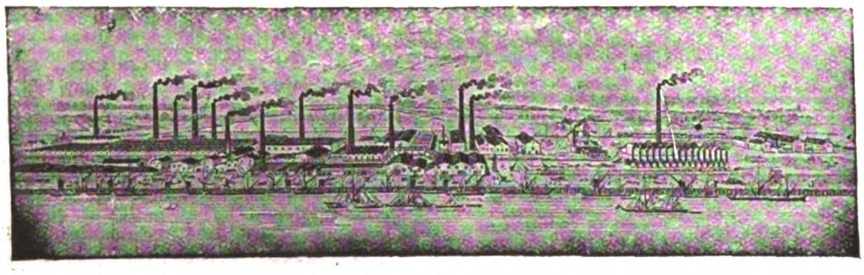
For erection of a fire station and mortuary. The Borough Engineer, Bromley, Kent.

Fire station.

Woodhams	£7,500 0 0
Knight	6,826 0 0
Graty	6,367 0 0
Ingleton	5,992 0 0
Parker & Sons	5,799 0 0
Eyre	5,700 0 0
Lawrence & Sons	5,471 0 0
J. & M. Patrick	5,420 0 0
Green	5,412 10 0
Willett	5,389 16 2
Barker	5,323 0 0
Arnaud & Son	5,268 0 0
Smith & Sons	5,232 0 0
Webster & Sons	5,200 0 0
Perry Bros.	5,197 0 0
Norris	5,150 0 0
Lowe & Co.	5,141 0 0
Foster & Dicksee	5,111 0 0
Appleby & Sons	5,055 0 0
H. & G. Taylor	5,029 0 0
Battley, Sons & Holness	5,021 0 0
White & Co.	5,017 0 0
Wallis	4,980 0 0
Pattinsons	4,920 0 0
Friday & Ling	4,884 10 11
Gathercole Bros.	4,780 0 0
Ellingham	4,480 0 0

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BROMLEY—*continued.*

Mortuary.

Woodhams	1,300	0	0
Ingleton	1,129	0	0
Parker & Sons	1,099	0	0
Knight	1,094	0	0
Eyre	1,070	0	0
Willett	1,057	0	0
Lawrence & Sons	1,052	0	0
Perry Bros.	1,037	0	0
J. & M. Patrick	1,026	0	0
Smith & Sons	1,005	0	0
Graty	1,004	0	0
Barker	999	0	0
Green	988	3	0
Arnaud & Son	977	0	0
Foster & Dicksee	975	0	0
Lowe & Co.	966	0	0
H. & G. Taylor	966	0	0
Pattinsons	953	0	0
Webster & Son	938	0	0
Battley, Sons & Holness	927	0	0
Wallis	921	0	0
Friday & Ling	912	7	7
Norris	910	0	0
White & Co.	907	0	0
Gathercole Bros.	900	0	0
Appleby & Sons	897	0	0
Ellingham	873	0	0

EAST KIRKBY.

For proposed house, Diamond Avenue, East Kirkby. Mr. WALTER H. WOODS, architect, Long Eaton, near Nottingham.

Tate & Son	£469	10	0
Coleman & Blackburn	445	0	0
Bains	439	10	0
HOOLE, Kirkby-in-Ashfield (*accepted*)	429	15	0

DOVER.

For sinking a working shaft and extending the headings at the waterworks, Dover. Mr. W. C. HAWKE, A.M.I.C.E., borough engineer.

Lawson & Son	£6,798	12	0
Rollinson & Sons	4,500	14	0
Tilley & Sons	4,196	7	6
Osenten	3,057	7	0
Batchelor	2,903	6	11
Sangwin	2,844	8	3
Hill	2,462	19	0
Nunn & Co.	2,425	18	6
Chamberlain	2,417	5	6
Castle & Co.	2,018	9	3
Moran & Son	1,931	11	0
PARAMORS, Margate (*accepted*)	1,778	11	0
Brebner & Co.	1,108	12	3

GREAT YARMOUTH.

For rebuilding the north wing of front for Palmers. Messrs. GEORGE BAINES & SON, 45 Clement's Inn, London, W.C., and A. S. HEWITT, Bank Chambers, Great Yarmouth, joint architects.

Wiseman	£3,540	0	0
Hawes & Sons	2,974	0	0
Leggett	2,775	0	0
Carter & Wright	2,689	17	0
Youngs & Son	2,659	0	0
EUSTOE (*accepted*)	2,652	0	0

GRANGE-OVER-SANDS.

For making-up of Fernhill Road, for the Urban District Council. Mr. T. HUDDLESTON, surveyor, Council Offices, Grange-over-Sands.

Keith	£633	3	10
Rainey Bros.	575	0	0
Frith	536	1	3
Johnson	523	10	5
Nelson	514	6	0
J. & T. Thompson	483	8	3
Egan & Sons	479	9	8
Thoms, Grange and Lancaster (*recommended*)	474	8	6

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The following tenders have been received for the sewerage extension works:—

Hughes & Lancaster, machinery	£2,989	15	0
Goodrich & Hamblyn, boilers, &c.	1,211	0	0
Seward, building work	679	0	0

HULL.

For the erection of a school in Sidmouth Street. Mr. Joseph H. Hirst, city architect.

Jackson & Son	£20,107	8	3
Kettlewell	19,888	0	0
Houlton & Son	18,600	0	0
Goates & Son	18,450	0	0
Levitt	18,350	0	0
Sanderson	18,279	0	0
Quibell, Son, & Greenwood	18,052	0	0
Fenwick	18,030	0	0
Harper	17,929	5	0
Panton, Hull (*accepted*)	17,489	0	0

LEYTON.

For private street works, for the Urban District Council. Mr. W. Dawson, M.I.C.E., surveyor, Leyton.

Adams	£1,402	12	6
Wilson	1,276	4	4
Anderson	1,264	7	11
Griffiths & Co.	1,258	2	2
Manders	1,254	9	5
Gibbons	1,246	5	2
Nunn	1,239	4	10
Coxhead, Leytonstone (*accepted*)	1,198	0	0

LONDON.

For the cleaning of the interior of the Keeton's Road school, Rotherhithe, for the L.C.C.

Parker & Sons	£657	0	0
Leng	604	0	0
Appleby & Sons	599	0	0
Triggs	572	0	0
Groves, Greenwich (*recommended*)	540	0	0

LONDON—*continued.*

For the erection of a boys' and girls' higher school for the accommodation of 500 children, on the Sherington Road site, Greenwich, for the L.C.C.

Parker & Sons	£15,630	0	0
Downs	14,655	0	0
Treasure & Son	14,649	0	0
F. & T. Thorne	14,343	0	0
Marsland & Sons	14,319	0	0
Holloway	14,282	0	0
Perry & Co.	14,275	0	0
Akers & Co.	14,228	0	0
F. & H. F. Higgs	14,219	0	0
Leng	14,150	0	0
J. & C. Bowyer	14,096	0	0
Kirk & Randall	13,985	0	0
Thomas & Edge	13,896	0	0
Smith & Sons	13,858	0	0
Johnson & Co., Wandsworth Common (*recommended*)	13,212	0	0
Architect's (Education) estimate	14,456	0	0

For the provision of lunacy wards in pavilion "B" at infirmary, Homerton, N.E., for Hackney Guardians. Mr. W. W. Finch, architect, 76 Finsbury Pavement, E.C.

Markham & Markham	£2,611	0	0
Monk	2,465	0	0
Wilkinson & Co.	2,424	0	0
Kerridge & Shaw	2,399	0	0
Pattinson & Sons	2,395	0	0
Nightingale	2,389	0	0
Wall	2,375	0	0
Stewart	2,360	0	0
Sheffield Bros.	2,350	0	0
Stapleton & Sons	2,299	0	0
Lawrance & Sons	2,298	0	0
Kirk & Randall	2,121	0	0
Thomas & Edge	2,070	0	0
Lawrence & Son	1,992	0	0
Barrett & Power, Hackney, N.E. (*accepted*)	1,987	0	0

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LONDON—*continued.*

For the erection of the superstructure of the extension of the chief station of the Fire Brigade, for the L.C.C.

Leslie & Co.	£18,059 0 0
Johnson & Co.	17,990 0 0
Higgs & Hill	17,934 0 0
Foster & Dicksee	17,777 0 0
Holland & Hannen	17,500 0 0
Trollope & Sons and Colls & Sons	17,484 0 0
Holloway Bros.	17,290 0 0
Mowlem & Co.	17,150 0 0
Holloway	17,067 0 0
Carmichael	17,047 0 0
Kirk & Randall	16,866 0 0
Kerridge & Shaw, Cambridge (*recommended*)	16,861 0 0
Architect's revised estimate	17,550 0 0

For the supply of 250 feet of wrought-iron railings and gates for St. Mary's Churchyard, Bermondsey, S.E.

Railings.

Jewiss	£386 8 0
Hosking	351 0 0
Hayward Bros. & Eckstein	338 8 0
Seaton	321 16 6
Bird & Co.	319 10 0
Goslin & Son	318 9 3
Bayliss, Jones & Bayliss	304 1 0
Hill & Smith (*recommended*)	221 1 4

Entrance Gates.

Hill & Smith (*recommended*)	24 16 10

For the supply of 250 feet Portland stone coping and piers for St. Mary's Churchyard, Bermondsey, S.E.

Carey, Sons & Co.	£224 15 0
Trenchard	218 10 0
Griffiths & Co.	211 2 6
Ginesi & Co.	210 5 0
Burke Co.	197 14 2
Manuelle	184 10 0
Mowlem & Co.	165 8 4
Portland Stone Co. (*recommended*)	161 14 7

LONDON—*continued.*

For repaving of a portion of the carriageway and the footway on the west side of King Edward Street, for the Corporation.

Carriageway.

Val de Travers Asphalte Paving Co.	£1,345 3 6
Limmer Asphalte Paving Co.	1,289 15 0
London Asphalte Paving Co.	1,283 12 9
FRENCH ASPHALTE PAVING Co. (*accepted*)	1,149 11 0

Footways.

London Asphalte Paving Co.	163 8 0
Limmer Asphalte Paving Co.	155 17 6
Val de Travers Asphalte Paving Co.	152 5 0
FRENCH ASPHALTE PAVING Co. (*accepted*)	148 1 0

For structural improvement of the Pritchard's Road School, Bethnal Green, N.E., for the L.C.C.

Perry & Co.	£872 0 0
F. & T. Thorne	853 7 3
Appleby & Sons	840 0 0
Johnson & Co.	723 0 0
Kirk & Randall	712 0 0
Leng	697 0 0
SYMES, Stratford (*accepted*)	687 0 0
Architect's (Education) estimate	718 0 0

MARKET HARBOROUGH.

For extensions of sewage disposal works. Mr. H. G. COALES, A.M.I.C.E., engineer and surveyor, Market Harborough.

Brebner & Co.	£4,576 10 2
Firth & Co.	3,848 19 10
Johnson Bros.	3,710 0 0
Bloxham	3,627 0 0
Wright & Co.	3,508 15 2
Palmer	3,469 4 11
Morley & Sons	3,467 5 4
Braithwaite & Co.	3,382 2 5
Dix & Co.	3,089 6 8
Edmondson & Wyatt	3,049 6 5
Brown	2,722 0 0
Garlick	2,669 17 6
Wilmott	2,647 0 0
Palmer	2,535 0 0
JEWELL, Market Harborough (*accepted*)	2,380 2 7

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MONKSEATON.

For laying out and constructing the following streets on the Monkseaton Estate, Northumberland, viz., portion of Queen's Road, portion of Holywell Avenue, Cragside Terrace, Chester Terrace, back street between Cragside Terrace and Tynedale Avenue. Mr. A. J. Rousell, A.M.I.C.E., surveyor.

Starkey	£2,952 0 0
McLaren	2,260 0 0
Henderson	2,249 0 0
Black	2,239 0 0
Bunch	2,201 0 0
Hollings	2,199 0 0
Thornton & Co.	2,081 0 0
Armstrong	1,999 0 0
Fisher	1,961 0 0
Young, Whitley (*accepted*)	1,911 0 0

ST. BREWARD.

For the erection of a china clay kiln, sheds, tanks, &c., for the North Cornwall China Clay Co. (1908), Ltd. Mr. T. H. Andrew, engineer, St. Austell.

Runnalls & Son	£4,990 0 0
Warne Bros.	4,535 0 0
Stevenson	4,490 0 0
Bennett	4,150 0 0
Jacob	3,799 0 0
Steer & Pearce	3,770 0 0
Nankivell & Sons, St. Breward (*accepted*)	3,695 0 0
Worth & Hawken	3,100 0 0
Pomroy	2,200 10 6

WALES.

For erection of fourteen cottages, &c., at Capel Llanilltern, near Creigiau, Llantrissant, Glamorganshire, for the Corporation of Cardiff. Mr. Wm. Harpur, M.I.C.E., city engineer.

Maggs & Co.	£7,920 0 0
Turner & Sons	7,778 14 10
Evans	7,249 0 0
Blacker Bros.	7,100 0 0
Knox & Wells	6,787 0 0
John & West	6,669 19 3
Symonds & Sons, Cardiff (*accepted*)	6,547 0 0

VARIETIES.

The North Dublin Rural District Council propose to erect ninety-seven labourers' cottages at a cost of 19,278*l.*

"Old English Porcelain" is the subject of a handsomely got-up and well-illustrated book, published by Messrs. Stoner & Evans, of 3 King Street, St. James's Square, W., as a souvenir of the fine exhibition of characteristic specimens of English industrial art recently held at their Galleries, which attracted so much well-deserved attention.

"The Energy of Radium" forms the subject of a very remarkable article in the Christmas number of "Harper's Magazine," which also contains among much other reading matter, an interesting account of "A Hilltop in Paris," illustrated by some clever etchings, and an article on "The Art of Harold Speed," by C. H. Caffin.

A company has been registered called the Bristol Grand Theatre of Varieties, Ltd., with a capital of 25,000*l.*, to erect a first-class music-hall at East Street, Bedminster. Plans prepared by Mr. W. S. Skinner, architect, Bristol, have been passed by the local authorities.

Cleethorpes Council held a special meeting on the 1st inst. to consider the position with regard to the proposed sewerage scheme. Having prepared a drainage scheme, to cost 35,000*l.*, the Council sought the sanction of the Local Government Board to proceed with the work, but the Department insisted on a bigger scheme, estimated to cost 90,000*l.*, and withheld their consent for the lesser proposal. Last week the Council unanimously resolved to apply to Parliament for powers to proceed with their original scheme.

The Corporation of Bath are inviting a competition value 50*l.* for the best scheme for laying out the well-known gardens adjoining the famous North Parade in that city. These gardens are historical and adjoin the Literary Institute, which stands upon the site of the Old Assembly Rooms, which for nearly half a century was ruled by Beau Nash, the King of Bath. In the gardens the Corporation have recently erected a drinking fountain where visitors can take the hot mineral waters in the open, and it is their intention to so develop this garden to make it one of the most attractive spots in the centre of the city. This is an opportunity afforded to architects who are skilled in the laying out of grounds with some knowledge of landscape gardening.

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ILLUSTRATIONS.

LIVING ARCHITECTS.—NO. 26, DR. A. MARSHALL MACKENZIE, LL.D., F.R.I.B.A.
NO. 27, DR. ALEXANDER ROSS, LL.D., F.R.I.B.A.

QUENBY HALL, LEICESTERSHIRE.—DETAILS OF PRINCIPAL BAYS.

COMPETITION DESIGN FOR BERKSHIRE COUNTY COUNCIL OFFICES, READING.

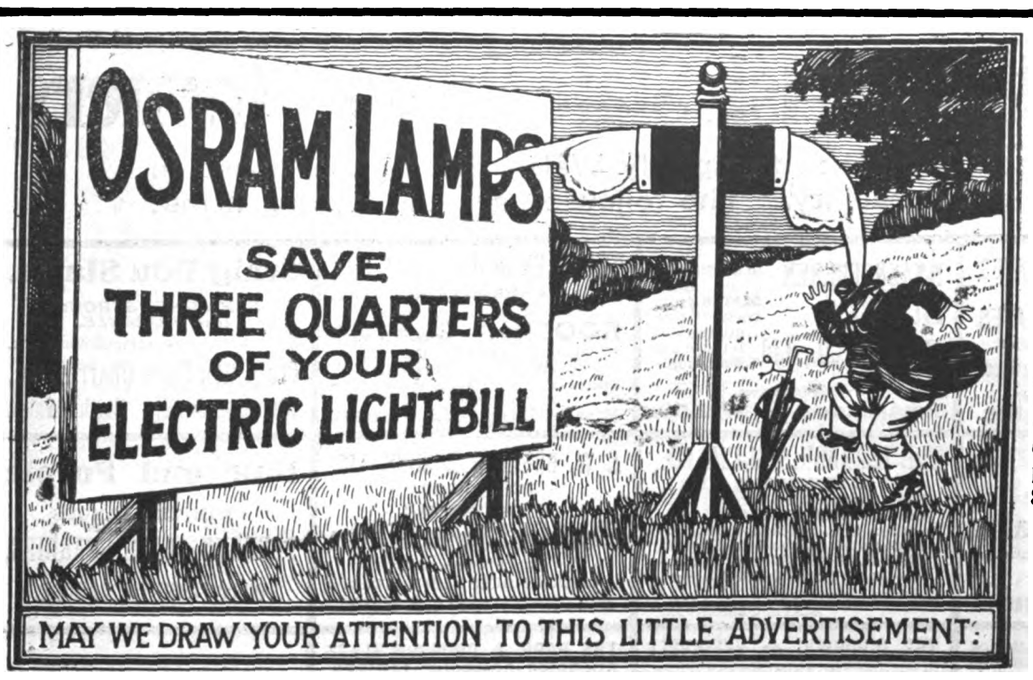
ON Monday last a Local Government Board inquiry was held at Croydon regarding the application made by the Council to borrow 10,770*l.* for the extension of the borough isolation hospital.

THE parish church of Holy Trinity, St. Andrews, N.B., was re-dedicated recently, after restoration at a cost of about 22,000*l.* The building dates from the first half of the fifteenth century, and the present work shows the edifice as it was before the destructive alteration of 1798. The church consists of a nave 161 feet long, divided from the aisles by arcades of nine arches. Beyond these project the north and south transepts, giving a total breadth of 127 feet. The south porch, a magnificent vaulted structure, has been rebuilt in memory of John Knox, who "in this town and Churche began God first to call me to the dignitie of a preacheour." The vaulted session house occupies the site of a former chapel, west of the south transept, and the vestries occupy a similar position in relation to the north transept. The church now seats 1,885 persons entirely on the ground floor. The pews are all of oak with carved bench ends. The walls both inside and outside are of finely tooled ashlar stonework, and are 3 feet, and in some cases 4 feet 6 inches thick. The windows have finely moulded jambs and traceried heads, with carvings at each end of the hood-moulds. Besides the south porch the church has also a magnificent double-arched doorway at the west front, over which are five fine long windows with inside pillars springing from behind a traceried gallery over the doorway. The clerestory is semi-circular and cusped, with an internal arch and angle shafts, with bases resting on the string course over the arcade. The church is rich in sculpture work. A chapel or aisle has been erected beside the south aisle. All the roofs are of carved oak, the framework of the north and south aisles being of timber grown in Fife. The roof of the long nave is barrel-vaulted and enriched with moulded ribs, carved bosses, and at each bay large sculptured panels painted and gilded. These form three rows, the centre illustrating the Life of our Lord, while the side panels depict incidents from the Old Testament. There is a complete installation of electric lighting. The building is heated by a hot-water system of coils and radiators, which are placed throughout the whole ground area and along the clerestory windows on each side. The work has been carried out by Mr. P. MacGregor Chalmers, architect, Glasgow.

NEW CATALOGUES.

EDWIN J. PEARCE & Co., LTD., Leicester, show by their catalogue that they are in a position to take a very large share in the erection of a building. They have their own system of fireproof floors (for which a patent has been applied), staircases, landings, &c. At Kirby Muxloe, near Leicester, are their granite concrete stone works, and they also turn out an improved grano-paving for stables, breweries and similar uses, 2-inch and 2½-inch paving slabs for footways, and concrete kerbs, &c. They possess a large stock of well-seasoned deal, pitch-pine, maple and oak for wood-block and parquet floors; and lastly they have carried out a number of contracts in Roman and Venetian mosaic for public and private buildings. This mosaic work is illustrated by several coloured reproductions, which show that the firm use most excellent designs and that the colour effects are harmonious, though not lacking in power.

As "fire-proof" construction can only be a relative term it is important that all other means of fire-resistance should be of the highest possible order. Therefore, although Messrs. F. Reddaway & Co., Ltd., 212 Shaftesbury Avenue, W.C., are not constructional engineers, yet they fill a prominent place in the ranks of those who are striving to combat the danger of ruin by fire. Their repute as makers of canvas and rubber lined hose-pipes may be said to have been unassailably established when in the present year they executed an order for the Admiralty for 485,000 feet of fire



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hose, this being the largest order ever placed. Messrs. Reddaway announce that instead of supplying their goods through merchants and dealers, as heretofore, they are now prepared to sell direct to users. They can boast that they are the only firm in the United Kingdom which prepares its own yarn, weaves its own canvas-hose and lines the same with rubber. Their "Sphincter Grip" is a patent method of armouring hose-pipe with spring steel-wire. Hose-pipes are only one of their appliances; in the catalogue are a great number of other aids for fighting the flames, including fittings, ladders, pumps, hydrants, buckets, and much else. Messrs. Reddaway are prepared to inspect buildings and report upon the best means of protection from fire.

The growth in the erection of hollow concrete block structures is one of the most noticeable developments in latter-day methods of building. This type has now left the experimental stage, when its users had to accept certain unknown as well as known risks. During the past five years and more a succession of structures have been built of these blocks. The variety of concrete machines has also been widening, and their efficiency has also been increasing. The Winget concrete building block machines were, we believe, one of the pioneers. Catalogue A, issued by the (U.K.) Winget Concrete Machine Co., Ltd., is a complete account of the subject of concrete blocks, and of their machines in particular, with illustrations of the processes of making, as well as of a very large number of bungalows, cottages (singly, in blocks, and in rows), villas, houses, and the accessories of the machine. The blocks are both hollow and solid, and are not subjected to any mechanical pressure. The "Winget" machine makes all classes of blocks required, from start to finish, except those parts having a length of over 32 inches. Under the most unfavourable conditions the output is guaranteed as over 200 blocks 32 inches by 9 inches by 9 inches a day. The catalogue is clearly and concisely written.

We have received from Messrs. Wilsons, Pease & Co., Ltd., ironmasters, of Middlesbrough-on-Tees, a copy of a booklet they are issuing. The works were established in 1853, and are consequently one of the oldest in that important district. They possess three blast furnaces, 82 feet high, with a capacity of 2,400 tons per week. An important part of their business is in direct castings and "open sand pig bed castings"; the iron is run direct from the blast furnaces. By this means these castings can be supplied cheaper than by the process known as "second melting." The firm produce railway chairs, columns, girders, brake blocks, bowl sleepers, &c. Several important specialities are made by the firm; one is their patent steel-back brake block, which consists of a plate of mild steel, upon which the body metal is cast. By this means the life of the block is practically doubled. Another, and possibly more important, patent is the tramway anchor chair, and Messrs. Wilsons, Pease & Co., Ltd., claim that this is in advance of any other chair upon the market, and is at the same time the cheapest. Their London agent is Mr. A. H. Sharpe, of 8 Eastcheap, E.C.

Messrs. Smith & Wellstood, of Bonnybridge, N.B., and Ludgate Circus, London, E.C., have just issued their new catalogue, which they entitle "A Practical Handbook for Architects and Householders." Illustrations are given of their patent ranges, and full descriptions, measurement, and charges. The catalogue is produced on good paper and in a handy size, and consists of sixty-four pages with cover. In the opening remarks Messrs. Smith & Wellstood state that this booklet has been compiled with a view to explain important points in cooking ranges, and to show how the many improvements introduced into "Wellstood" cooking ranges economise fuel and labour.

Messrs. Twyford, Ltd., the well-known sanitary potters of Hanley, have just issued three new lists. No. 1 shows their pedestal valve w.c.'s, for which the advantages claimed are practically silent in action, area of water surface larger than seat opening, and double seal against sewer gas. The basin, slop, top and enclosure are all made in fine white C.V. earthenware, which the firm guarantee as non-crasing; the materials used and the workmanship are guaranteed of the best. Pamphlet No. 2 shows the new design "Eurite" lavatories. The basin is of the latest pattern, with plain surfaces and rounded edges, and is of the same high quality of manufacture as the w.c.; the legs and supports are nickel-plated on iron, and are neat and simple in design. Pamphlet No. 3 is of Messrs. Twyford's new design "Convenient" w.c. "The Convenient" w.c. combination is compact in construction, silent in action, and neat in design; the basin

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is the now well-known Centaur syphon, which has a large water area, and particularly deep seat. The cistern is constructed on the float-valve principle, and operates with the greatest ease, whether supplied on the press-button or lever action. All are guaranteed of first-class workmanship, and to uphold the firm's reputation for durability and for the purity of colour. It is pleasant to review these three little pamphlets; the printing is clear, the illustrations are excellent, and the art paper assures a good impression. An architect can make use of these where many a catalogue has to be sacrificed to make room.

MESSRS. BARFORD & PERKINS, engineers, Peterborough, have adopted an ingenious method for showing the wide geographical area covered by them in their business. Inside their catalogue they insert a map of England with an index showing the towns and buildings in which their steam cooking and other apparatus are fixed. As these numbered nearly two hundred over seven years ago, and as they are evenly distributed, it would be an easy matter for anyone to see the apparatus in operation. Messrs. Barford & Perkins have been engaged in this kind of work for sixty years; indeed, they were one of the first to introduce the use of steam into workhouses and other institutions for cooking, laundry-work, heating, and hot-water supply. Special attention should be called to their slow-combustion steam boilers, which are designed to facilitate cleaning out and to effect economy and durability. Steam-cooking apparatus is only one of the many appliances manufactured by Messrs. Barford & Perkins for use in large and small workhouses, asylums, schools, and similar institutions.

APPRENTICESHIP AND TECHNICAL EDUCATION.

(Concluded from last week.)

MR. WALTER HAZELL, speaking on behalf of the printing trades, said there could be no gainsaying the statement that employers should not be satisfied with themselves when they considered their position with regard to this question, for they had not been living up to their responsibilities. They had opportunities for doing good to their boys, but they did not take advantage of them. It was very uncertain under the existing system what teaching the lads might get. A boy might be under a foreman of great skill and good conscience who would turn him into a skilled workman; separated from him only by a partition there might be another such boy; who under another kind of foreman might not learn anything at all. In his own firm they had tried to remedy this by sending each apprentice at regular intervals before one of the heads to report himself. In addition they did all that lay within their power, as by paying a portion of the fees to promote development outside the workshops. It was found that the lads began by attending regularly the evening classes, but that they gradually began to fall off. The reason was that the working hours during the day were too long. In addition in some instances the boys had to spend over a couple of hours in getting to and from their employment. After a hard day's work how much strength has the average boy got for further study? Of course there were physical and mental exceptions to this, but they had to provide for the average. The boys who worked overtime in their evening schools ought really to be in bed. What was wanted was technical education in trade schools during working hours. To a certain extent something had already been done on these lines, but not enough. The nation was far too insular, and would find that unless they roused themselves to a greater interest in these matters they would go to the wall.

Mr. W. A. Nicholls, of the National Union of Teachers, said that it was very desirable to foster public interest in the question as to the best training to be provided in our national schools. In 1870 and 1876 when the children were being forced in large numbers into elementary schools, the great mistake was made of making the education too mechanical and formal, and with very little reference to the life of the scholars. It was to be hoped that the opposite mistake was not being made now. The education in the elementary schools of London should not be arranged purely with a view to the children being engaged in industrial occupations afterwards. Some of the scholars should receive the foundations that were necessary for them to fill what were called the higher positions of life, so that the young scholar should have the chance of going to the very best secondary schools and finally to the universities. But still the studies of both boys and girls should be made better adapted to the work they will have to do. They wanted to be prepared to

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take up some trade or industry, but not to be irrevocably tied down to that trade or industry. If of real ability he or she will make use of the extraordinary facilities now offered for the development of intellect. The education in our elementary schools should however, be made less formal and more practical. It was quite possible to shorten the number of hours at present devoted to literary subjects, so that in the afternoon time might be given to the training of hand and eye, and making these two organs entirely subservient to an intelligent brain. The classes could be gradually rendered more interesting, and the children they turned out more useful to the community at large. But there was one thing that was necessary and that was to raise the age to fifteen. If it was objected that the working man could not afford to do without the help of the child until that age he would say that it would pay the State to make it possible. It would bring both economic and intellectual advantages. It was impossible to expect that the ordinary girl or boy would come to evening classes after working all day with any very great keenness for the acquisition of knowledge or to work hard. But if their hours of labour were limited to thirty a week then they would be in a position to gain that learning which would save them from sinking into the unskilled trades as at present, and joining the ranks of the unemployed and unemployable.

Mr. E. Penton, speaking as a representative of the boot and shoe trade, said that so far as his experience went, the question was best left to the educational authority. There certainly was a difficult gap between the period when the boy left his elementary school and the time when he was ready to take full advantage of technical education; that was to say during the two or three years after leaving school. There was no good in his taking up technical work at once, for there was enough that he could pick up about his business in the workshop. The objection to this was that in the interval the boy might lose the art of learning. It was a great tax to expect a boy to be able to work hard after his working hours. In these days of specialisation they wanted trade schools that would teach a boy his job and only his job, for their workmen had to be the best possible. In a trade school it was possible to teach him sufficient theory to make him a very skilled operator with only a short experience in a factory. It would be a great mistake if in training schools they did not systematise but made a boy a Jack-of-all-trades. Apprenticeship in the boot trade was a thing of the past.

Sir George Gibb introduced the second point down for consideration:—"The organisation of facilities for bringing boys and girls who are leaving the public elementary schools into better touch with the openings that exist in the industrial and commercial world." He said that we educate our children and employ them afterwards; but the critical passage in between, on which so much rested, was left to chance. Upon that period depended largely whether the value of training was to be realised or wasted. The greatest national asset was the skill and industry of the people, without it capital would be fruitless and barren. Yet there was a considerable waste of that asset. The value of training was frequently lost, unsuitable employment was encouraged and unemployment resulted, from the existing defective organisation. Advice at the moment of a choice of employment was of immense value yet it was impossible sometimes to obtain. The existing policy which brings about so much national waste was therefore to be avoided. It was impossible for isolated individuals to bring supply and demand into proper harmonious relations. There must be special organisation to bring training into closer relations with what was the object of training—not personal culture, but with getting work to earn a living. Such a body would deal not with a selected best, but with all sorts. Such an organisation would have to be genuinely used by employers and by those who desired to obtain help on leaving school. A vast amount of rough sorting was possible.

Sir William Bousfield said that in London over twenty local committees had been formed for the purpose of aiding parents and children to obtain satisfactory work. The first object of the committee was to put the children to employment that was likely to lead to something, so that they should not be leaving their work after three years and turning to another trade. Parents seemed so ignorant on the subject of the best way of choosing the kind of employment for their children. In London the number of trades was so great that there was a difficulty in deciding which would prove of the greatest advantage to the different children. In the provinces where there was one staple industry followed by father and

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son this did not apply in the same way. The headmasters of elementary schools were generally not in a position to properly advise, no matter how willing they might be. Another part of the work of the committees was to enter into relations with employers. A right choice at the beginning was all important. It was almost impossible for a boy to change his trade except at the very beginning. A plumber's mate, for example is, except in unusual conditions, unable to get beyond the position of plumber's mate. It might be possible to revive apprenticeship in some few cases, and it might be useful. But it was absolutely necessary that there should be a substantial reduction in the premiums demanded; 30*l.* was far too much. The experience of the committees was that in those cases where they had paid the apprenticeship premiums the boys were very pleased to repay all or part of the amount when they were able.

Mr. A. Gossep (general secretary of the National Amalgamated Furnishing Trades Association) said that he heartily agreed as to the absolute necessity of boys entering skilled trades receiving a better training; if it was not forthcoming very soon there would be no scientific workmen left in the country. Unfortunately at the present time there was nothing like enough room for all. He could not agree with what a previous speaker had said as to the causes of the present lack of education among the boys. The so-called apathy of the parents was really due to their being forced by poverty to send out their children to work directly they could help the family. The real cure was to be found by raising the standard of taste among all classes, and more particularly among the rich, so that they should not be content to purchase shoddy goods and thereby help to stifle the pride in his work which should be felt by every one, and which at the present time the young men were not encouraged to develop. The surest means to reduce the prevalent unemployment was to reduce the hours of labour. Thirty hours a week were ample for a young man who was doing extra study at technical classes. These classes should be conducted at the expense of the employers. For as they benefited by the skill of the workmen produced it was not altogether fair that the State should bear the entire burden.

Mr. E. Friend (representing the vellum binders), Mr. Ben Tillett, Mr. Sedgewick, and others addressed the meeting, which was brought to a close by Mr. Barlow, of the London County Council, commenting on its highly satisfactory nature.

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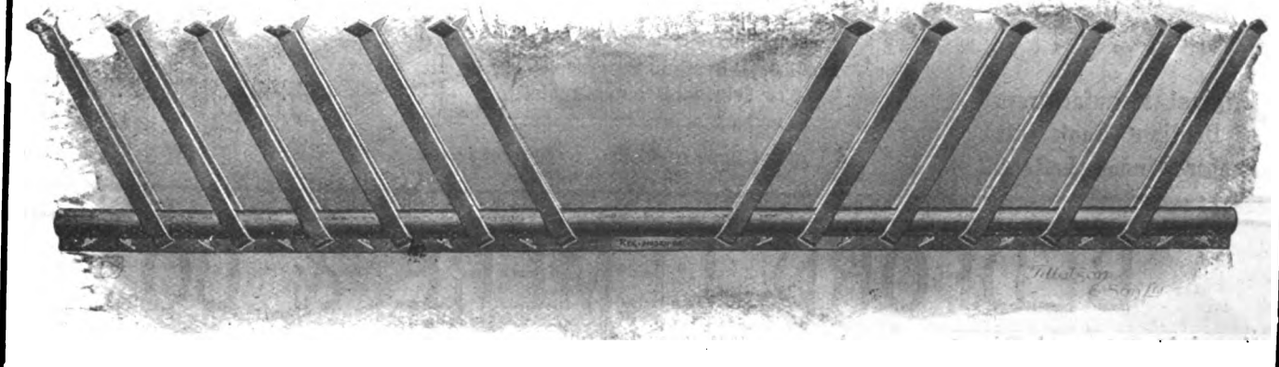
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AN L.C.C. BUILDING ESTATE.

In May last the London County Council decided to proceed in due course with the development of the Old Oak Estate, Hammersmith, W., by the erection thereon of artisans' dwellings. The Housing of the Working Classes Committee now recommend that the work should be commenced as soon as possible. Their report on the subject is as follows:—

There can be little doubt that the district surrounding this estate will grow very rapidly in the near future, and we consider it desirable that arrangements should now be made for building operations to be commenced as soon as possible. The estate, which was purchased from the Ecclesiastical Commissioners in 1905 for 29,858*l.*, has been divided into two parts owing to the acquisition by the Great Western Railway Company of a strip of land for the purpose of constructing a branch line from Acton to Shepherd's Bush. The Council has received from the company in respect of the sale of this land and the damage sustained by the estate a sum of 10,500*l.*, which, after deducting 450*l.* for plans rendered useless by the severance of the estate, has been carried to the Consolidated Loans Fund in redemption of debt, the effect being to reduce the charge for land to be made against the dwellings account. The estate now comprises some forty-six acres, and we propose that in the first instance the Council should proceed with the development of the section situated to the west of the proposed railway. This section, which is about fourteen acres in extent, or rather less than one-third of the whole estate, is triangular in shape, and will be connected with the eastern section at the north-west and south-east boundaries and about midway between those points by roads under the railway. Particulars of the scheme of development which we have provisionally approved

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for the western section, and of the rents proposed to be charged, are as follows:—

Number and Description of Tenements	Particulars of Accommodation	Rents
5 shops	Five rooms over shop...	30*l.* a year.
42 cottages	Five rooms, scullery and bath	10*s.* a week.
27 ,,	Four rooms, boxroom, scullery and bath	10*s.* a week.
92 ,,	Four rooms, scullery and bath	5 at 10*s.* a week and 87 at 9*s.* 6*d.* a week.
14 ,,	Three rooms, boxroom, scullery and bath	8*s.* 6*d.* a week.
9 ,,	Three rooms, boxroom and scullery ...	8*s.* a week,
101 ,,	Three rooms and scullery	97 at 7*s.* a week and 4 at 5*s.* 6*d.* a week.
6 ,,	Two rooms, boxroom and scullery ...	4 at 5*s.* 6*d.* a week and 2 at 5*s.* a week.
16 ,,	Two rooms and scullery	4*s.* a week.
12 flats	Two rooms and scullery	3*s.* 9*d.*, a week.
14 ,,	One room with bed recess and scullery ...	3*s.* 6*d.* a week.
328		

The rents mentioned have not been definitely fixed, but they are subject to slight adjustment at a later stage. The rents of the cottages and flats are inclusive of rates.

In framing the present scheme we have been guided by the policy of endeavouring to meet the demand for the smaller cottages which can be let at rents within the reach of those earning from 25*s.* to 30*s.* a week. We think that only a small number of the larger type of cottage, for which a rent of 10*s.* a week will be charged, should be erected, and that rather more than a third of the total number should be three-roomed cottages, to be let at rents ranging from 7*s.* to 8*s.* 6*d.* per week. We have also considered the needs of the smaller families of the poorer class requiring only one or two rooms, and we propose that, as an experiment, the Council should provide a limited number of tenements of one, two, and three rooms, at very low rents. The smallest type of one-room cottage flat, with a recess for a bed and a separate scullery and water-closet, can probably be let at a rent of 3*s.* 6*d.* a week. As we have pointed out on previous occasions, we feel that those who require larger tenements than those now proposed, and who can afford to pay a higher rent than 10*s.* a week, are being provided for by other agencies.

In connection with the development of the Old Oak estate we have considered the question of utilising the Acquisition of Lands (Part III.) Fund, the balance of which, after defraying certain expenditure on the Millbank site account, amounted on September 30, 1909, to 49,345*l.* This fund was created under statutory authority by the transfer of a sum of 50,000*l.* from the account of the Westminster improvement to the capital account of the Dwelling-house Improvement Fund to be applied towards the cost of acquiring other land for the purpose of Part III. of the Housing of the Working Classes Act, 1890. Authority was, however, conferred by the London County Council (General Powers) Act, 1908, for the application of the fund towards the development of estates already acquired under Part III. of the Act; and on February 11, 1908, the Council decided that any portion of the fund applied in pursuance of such authority should be made subject to a charge for interest equal to the cost of the capital moneys in question when raised for the Westminster improvement, and to a sinking fund charge on the usual basis, and that the surplus accruing annually should be credited to the Housing (Part III.) account in diminution of any charge upon the rates arising thereunder. The effect of this will be that by utilising the balance of the fund the capital account of the dwellings will benefit to the extent of 896*l.* It will be convenient, both as regards estimates and accounts, if the use of the fund be confined to one estate, and we suggest, therefore, that the balance of the fund should be applied towards the cost of the cottages now proposed to be erected on the western section of the Old Oak estate.

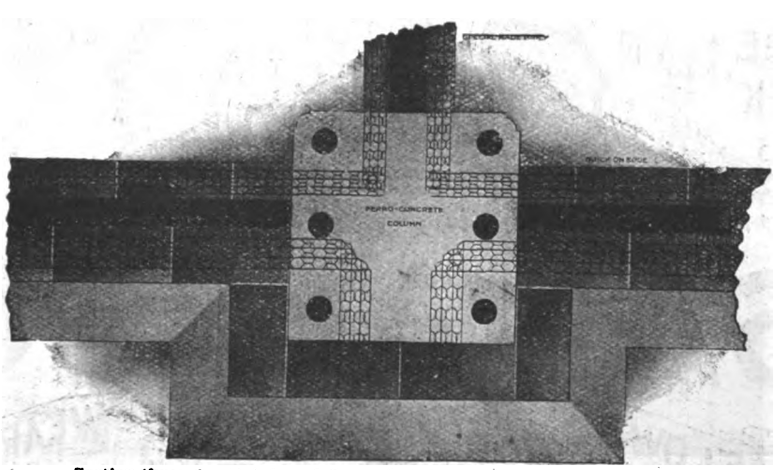
As regards the financial aspect of the present scheme, it is estimated that the income to be derived from rents will be sufficient to provide for all expenses of maintenance and management and to leave a balance available for payment of debt charges on a capital sum of 95,597*l.*, calculating interest at 3*l.* 12*s.* 6*d.* per cent. By utilising the balance of the Acquisition of Lands (Part III.) Fund at 3*l.* 11*s.* per cent. this sum will be increased to 96,493*l.*, which represents the maximum capital expenditure which may be incurred if the undertaking is to be self-supporting. The total cost of developing the section, including erection of cottages, formation of roads, general development charges and all incidentals, will probably not exceed 88,511*l.* To this should be added the sum of 5,628*l.*, being the proportion of the net cost of the land applicable to this section, making a total capital outlay of 94,139*l.* The estimated capital surplus is therefore 2,354*l.*

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Among the conditions upon which the Council purchased the estate were the following:—

(1) A plot of land 1½ acres in extent in the centre of the estate to be re-conveyed to the Ecclesiastical Commissioners to be used as a site for a church, the area of this plot to include half the area of the surrounding roads and to be deducted from the acreage sold and not charged for.

(2) Ducane Road to be widened to 50 feet in front of Wormwood Scrubs prison and continued along the southern boundary of the estate to Old Oak Common Lane, the Council paying a moiety of the cost of constructing the road and providing half the land required for the extension.

(3) The contract price for the houses fronting on Ducane Road to be not less than 250*l.* each.

(4) The scheme for the laying out of the estate to be subject to the approval of the Commissioners.

The particulars which should now be submitted to the Commissioners for their approval include a plan showing the laying out of the western section of the estate and the church site, which we suggest should be in a central position on the eastern section.

We propose in the first place to proceed with the widening and extension of Ducane Road in conjunction with the work of constructing roads and sewers on the western section. The cost of this work, together with the cost of works of a general character required in connection with the development of the western section, is estimated at 20,550*l.*, of which about 3,200*l.* is chargeable to the eastern section of the estate. A moiety of the cost of widening and extending Ducane Road is recoverable from the Ecclesiastical Commissioners and the Great Western Railway Company in proportions to be determined hereafter. The cost of the cottages and shops proposed to be erected on the western section, including articles to be bought direct, printing and professional charges, is estimated at 74,511*l.* It is proposed to proceed with the erection of the cottages as soon as the construction of roads is sufficiently advanced to permit of building operations being commenced. The development of the whole estate will occupy about ten years, and will cost approximately 340,000*l.*; while the expenditure of 95,061*l.* which we now ask the Council to sanction will, it is estimated, be divided as follows: Financial year 1909-10, 4,000*l.*; 1910-11, 30,000*l.*; 1911-12, 30,000*l.*; and the remainder in 1912-13.

We are in communication with the Education Committee as to the provision of school accommodation on the estate, and we will report further on the subject at a later date. The approval of the Local Government Board will be required to the utilisation of any of the land for school purposes, and the Board's approval is also required to the provision of the five shops included in the present scheme. We recommend:—

(*a*) That the estimate of expenditure on capital account of 20,550*l.*, submitted to the Finance Committee in respect of the construction of roads and sewers and works of general development on the western section of the Old Oak estate, and the widening and extension of Ducane Road along the southern boundary of the estate, and of all incidental expenses in connection therewith, be approved as an estimate of costs, debt, or liability under section 80 (3) of the Local Government Act, 1888.

(*b*) That the estimate of expenditure on capital account of 74,511*l.*, submitted by the Finance Committee in respect of the erection of cottages and shops on the western section of the Old Oak estate, and of all incidental expenses in connection therewith, be approved as an estimate of costs, debt, or liability under section 80 (3) of the Local Government Act, 1888.

(*c*) That the amount standing to the credit of the Acquisition of Lands (Part III.) Fund be applied towards the cost of the development of the western section of the Old Oak estate, subject to the conditions specified in the resolution of February 11, 1908.

(*d*) That the scheme submitted by the Housing of the Working Classes Committee for the laying out of the western section of the Old Oak estate and the approximate position of the church site on the eastern section of the estate, as indicated by blue colour on the plan, be approved; and that the Ecclesiastical Commissioners be asked to approve the scheme for the laying out of the western section and the approximate position of the church site, in accordance with the terms of the agreement entered into between the Commissioners and the Council on February 22, 1905.

(*e*) That, in pursuance of section 11 of the Housing of the Working Classes Act, 1903, application be made to the Local Government Board for its consent to the provision of five shops on the western section of the Old Oak estate, as shown by yellow colour on the plan.



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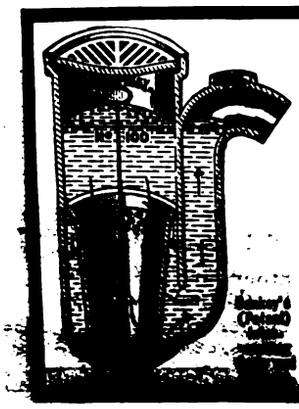
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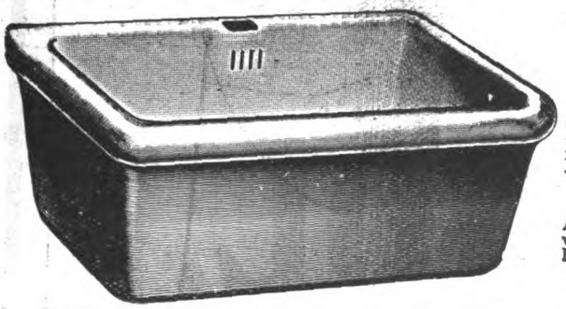
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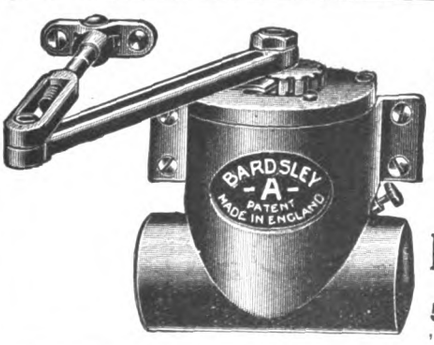
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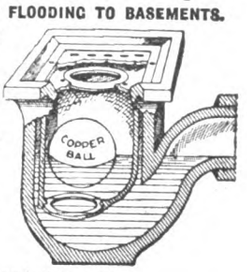
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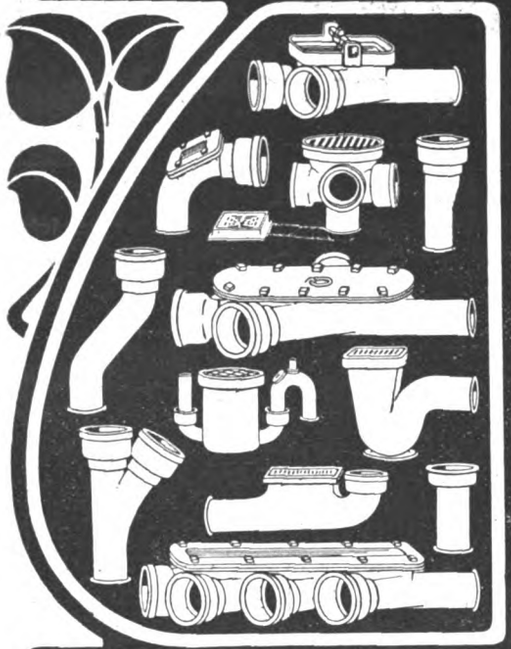
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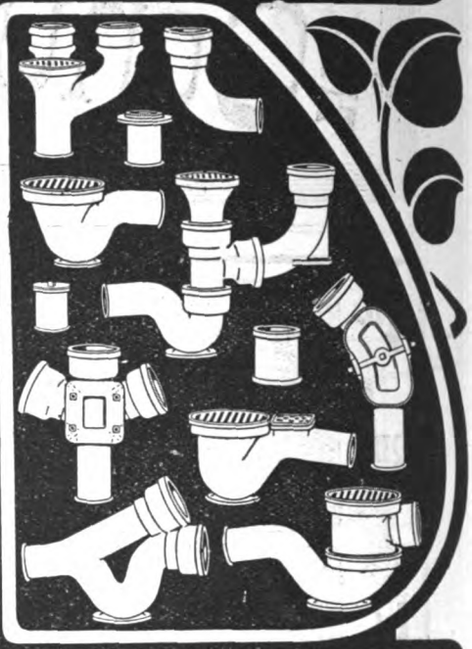
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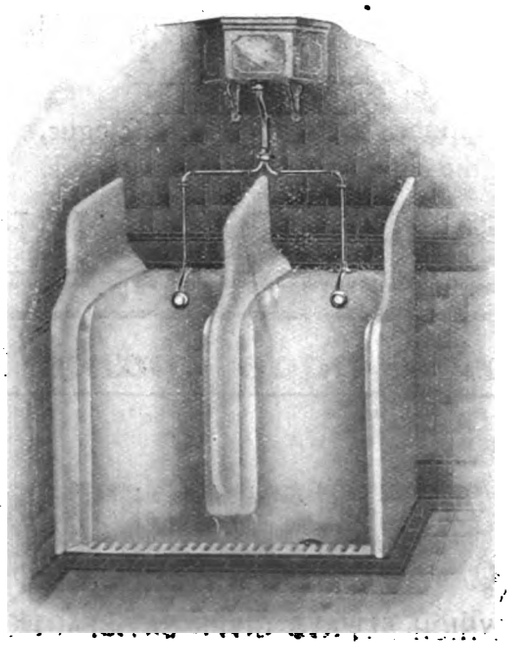


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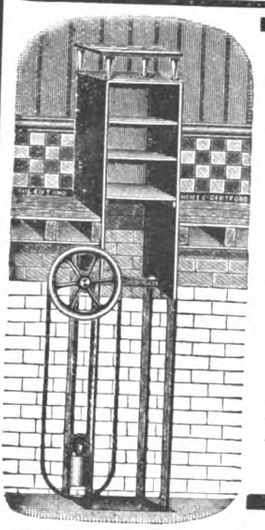
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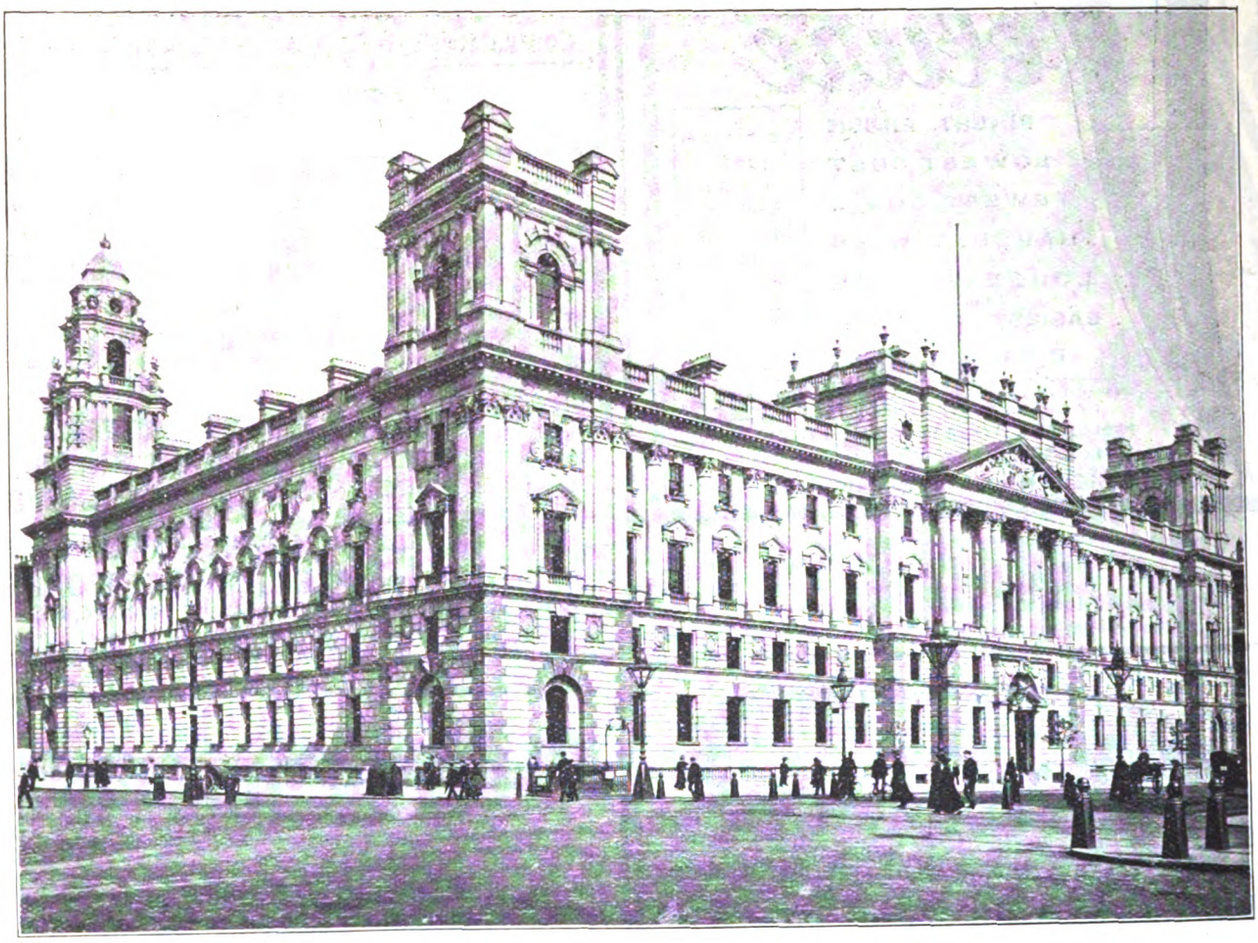
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Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

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LARNE.—Jan. 1.—For a technical school proposed to be erected in Victoria Street. A premium of 21*l.* will be paid for the approved design. Mr. Thomas Clearkin, Secretary, Technical Instruction Committee, Larne.

LEEDS.—Jan. 1.—The Directors of the Leeds Co-operative Society, Ltd., invite designs for new business premises and offices. Premiums of 100*l.*, 50*l.*, and 25*l.* for designs placed first, second, and third by assessor. Conditions and lithographed plans on application to Secretary on receipt of stamped addressed foolscap envelope with deposit, 2*l.* 2*s.* Further particulars in advertisement. Secretary, John W. Fawcett, 10 Albion Street, Leeds.

OLDHAM.—Feb. 1.—The Town Council invite competitive designs from architects practising or residing within the borough for an extension of the town hall. Premiums of 50*l.*, 30*l.*, and 20*l.* are offered, together with 5*l.* for every competitor who carries out the instructions. Apply to Mr. E. C. Foote, borough surveyor, Oldham, Lancs.

SOUTHAMPTON.—Jan. 27.—The Corporation invite plans from local architects for a pavilion on the Common. Premiums of 10*l.* and 5*l.* Mr. R. R. Linthorne, town clerk, Municipal Offices, Southampton.

SOUTHEND-ON-SEA.—Dec. 31.—For a new Council school. Competition is limited to architects practising in the borough. Mr. J. W. Barrow, Education Offices, Southend-on-Sea.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.

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CONTRACTS OPEN.

Ashby-de-la-Zouch.—Jan. 1.—For erection of an elementary school, together with out-offices, drainage, and other works connected therewith. Mr. John Day, architect, 8 New Street, Leicester.

Banbury.—Jan. 1.—For lead roof gutters, building repairs, and reinstatements, at Dashwood Road Council school. Mr. J. Timms, architect and surveyor, 48 Parsons Street, Banbury.

Bedford.—Jan. 7.—For the erection of certain buildings in connection with a proposed refuse destructor for the borough, together with the construction of approach roads, paved areas, formation of site, erection of a manager's cottage, and other works. Deposit 3*l.* 3*s.* Major Hector Tulloch, C.B., R.E., engineer, 28 Victoria Street, London, S.W.

Blackpool.—Jan. 5.—For erection of offices in Sefton Street, for the health and cleansing committees. Deposit 1*l.* 1*s.* Mr. John S. Brodie, borough engineer, Town Hall, Blackpool.

Brighton.—Jan. 13.—For the erection of an additional office for police purposes, on a portion of the forecourt at the north-east corner of the town hall. The Borough Surveyor, Town Hall, Brighton.

Bury.—Dec. 28.—For erection of an elementary school in Elton, Bury, Lancs., for the Corporation. Deposit 1*l.* The Director of Education, 8 Bank Street, Bury.

Buxton.—For alterations and additions to shop, Scarsdale Place. Mr. G. E. Garlick, architect and surveyor, Quadrant Chambers, Buxton.

Chelmsford.—Jan. 17.—For erection of an elementary school at Trinity Road, Springfield. Deposit 2*l.* Messrs. Chas. & W. H. Pertwee, architects, Chelmsford.

Crewe.—Jan. 8.—For new training college for teachers to be erected at Crewe, for the County Education Committee. Deposit 2*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newsgate Street, Chester.

Devonport.—Jan. 12.—For the erection of 20A and 20B married soldiers' quarters, in flats and cottages, in three blocks, at Old Granby Barracks, Devonport, in the Southern Command. Deposit 10*s.* Apply by January 3 at the Office of the Director of Barrack Construction, 80 Pall Mall, London, S.W., or at the Barrack Construction Office, Old Granby Barracks, Devonport.

Dewsbury.—For the various works required in the erection of a house, Healds Road. Messrs. R. Castle & Son, architects, L. C. and M. Bank Chambers, Cleckheaton.

Enfield.—Jan. 17.—For construction of pumping station buildings, together with chimney, stores, coal bays, cottage, roadway, drainage, and other contingent works, at Hadley Road, for the Metropolitan Water Board. The Chief Engineer, Savoy Court, W.C. Deposit 10*l.* with the Accountant at Savoy Court, Strand, W.C.

Exeter.—Dec. 28.—For erection of school buildings, new day room for the girls' department, and other work at the West of England Institution for the Blind. Mr. James Jerman, F.R.I.B.A., 1 Bedford Circus, Exeter.

Folkestone.—Dec. 28.—For works in connection with the extension of the public library on Grace Hill. Deposit 1*l.* 1*s.* The Borough Surveyor's office, Church Street.

Great Chart.—Jan. 5.—For erection of a new cloak room at the Great Chart Council school, Kent. Mr. J. M. Poncia, correspondent, 17 Bank Street, Ashford, Kent.

Halesowen.—Jan. 3.—For the erection of tool house at the cemetery. Deposit 1*l.* 1*s.* Mr. A. E. Priest, P.A.S.I., Hagley Street, Halesowen.

Jarrow-on-Tyne.—Jan. 6.—For erection of public baths in Walter Street. Deposit 2*l.* 2*s.* Mr. J. H. Morton, F.R.I.B.A., architect, 50 King Street, South Shields, and 57 Westgate Road, Newcastle-on-Tyne.

Ireland.—Jan. 1.—For erection of a church building on the Glenarm Road, Larne, co. Antrim. Mr. John Seeds, architect, 7 Donegall Square West, Belfast.

Ireland.—Dec. 29.—For building a new board room and additional office accommodation at the workhouse, Loughlinstown, for the Guardians of Rathdown Union. Deposit 1*l.* 1*s.* Mr. George T. Moore, C.E., 1 and 2 Foster Place, Dublin.

Kirbymoorside.—Dec. 29.—For proposed extensive alterations and additions at the Kirbymoorside Council school Yorks. Mr. J. C. Wrigley, secretary, County Hall, Northallerton.

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MACCLESFIELD.—Jan. 18.—For the erection of a detached villa for private patients at Parkside Asylum. Deposit 2*l.* Mr. H. Beswick, county architect, Chester.

MARGATE.—Jan. 4.—For the extension of the glass and iron shelter at Westbrook. Borough Surveyor, 13 Grosvenor Place, Margate.

MARRICK.—Jan. 8.—For pulling down and re-erecting a dwelling house at Marrick, near Reeth, Swaledale, Yorks. Mr. Frank Martin, architect, 2 Prebend Row, Darlington.

NEWTON ABBOT.—Dec. 30.—For erection and completion of the following works, for the Urban District Council, viz.:—(*a*) Boundary walls, gates, and railings, &c.; contract No. 1. (*b*) Sexton's lodge, store, &c.; contract No. 2. (*c*) Mortuary chapel; contract No. 3; at the new cemetery, Wolborough. Deposit 2*l.* 2*s.* each set of quantities. The Surveyor's Office, Town Hall, Newton Abbot.

NORTHWICH.—Jan. 15.—For erection of school to accommodate 350 children, at Northwich Darwin Street. Deposit 1*l.* 1*s.* Apply after December 28 at the Education Office, Verdin Technical school, Northwich.

OTLEY.—Dec. 31.—For the several works required in erection of printing works at Otley, Yorks. Forward applications to Messrs. Empsall & Clarkson, architects and surveyors, 7 Exchange, Bradford.

OKEHAMPTON.—Jan. 17.—For new higher elementary school for 120 children, with laboratory, cooking, and manual training rooms, at Okehampton, Devon. Deposit 1*l.* 1*s.* The County Architect (education), 1 Richmond Road, Exeter.

OXFORD.—Jan. 3.—For erection of a boys' and girls' school in Thames Street, St. Aldate's, and for additions and alterations to certain existing buildings intended to form an infants' school in Luther Street. Deposit 2*l.* 2*s.* The City Estates Surveyor, Town Hall, Oxford.

RYHOPE.—Jan. 11.—The Durham County Council invite sole tenders for a secondary school at Ryhope. Mr. W. Rushworth, Shire Hall, Durham.

SCOTLAND.—Dec. 27.—For the mason, joiner, slater, plasterer and plumber works of additions to and alterations on town treasurer's offices, Church Street, Berwick-upon-Tweed. Messrs. J. Stevenson & Son, 14 North Terrace, Berwick-on-Tweed.

SCOTLAND.—Dec. 29.—For the mason, carpenter, slater, plumber, plasterer and painter works of houses to be erected in Maisondieu Place, Elgin. Mr. John Wittet, architect, Elgin.

SOUTH FARNBOROUGH.—Jan. 10.—For erection of a county school for 570 children at South Farnborough, Hants. Deposit 5*l.* 5*s.* Apply after December 28 to Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

SPENNYMOOR.—Jan. 8.—For the erection of a higher elementary school. Mr. W. Rushworth, Shire Hall, Durham.

STEETON.—Dec. 28.—The West Riding education committee invite whole or separate tenders for the following work:—Steeton Provided school, alterations (builder, joiner, plasterer, plumber, painter). Deposit 1*l.* The West Riding Architect, County Hall, Wakefield.

WALES.—For erection of a new Welsh Methodist church and school in Cowbridge Road, Cardiff. Messrs. Habershon, Fawckner & Co., architects, 14 High Street, Cardiff (and Newport).

WALES.—Dec. 31.—For erection of fifteen or more cottages at Blackwood (Mon.), for the Pretoria Building Club. Mr. William Dowdeswell, architect, Treharris.

WALES.—Dec. 31.—For erection of a roller skating rink at Pontycymmer. Deposit 1*l.* 1*s.* Messrs. Cook & Edwards, MM.I.A., architects, Masonic Buildings, Bridgend.

WALES.—Jan. 1.—For the extension of council chamber and the erection of a new wing, consisting of three offices and a committee room, at the Council offices, Hengoed. Deposit 2*l.* 2*s.* Mr. James P. Jones, F.I.S.E., surveyor, Council Offices, Hengoed, via Cardiff.

WALES.—Jan. 5.—For erection of a pair of cottage homes for children at Abercwmboi, Aberdare. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

WALES.—Jan. 5.—For building additions to the County school at Llandovery, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., county architect, County Offices, Carmarthen.

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Wales.—Jan. 7.—For erection of an infants' school for 350 places at Cefn Coed, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor, County Hall, Brecon.

Wales.—Jan. 7.—For erection of a mixed school for forty places at Dyffryn Crawnon, near Llangynidr, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor to the Breconshire Education Committee, County Hall, Brecon.

Warrington.—Dec. 30.—For erection and completion of two new swimming baths, new slipper baths, and sundry alterations to the Corporation baths. Deposit 2*l.* 2*s.* Mr. Thos. Longdin, borough engineer and surveyor.

West Felton.—Jan. 7.—For erection of a cottage and farm buildings and alterations and additions to certain existing houses and buildings for small holdings at West Felton, Salop, about 2¼ miles from Rednal station. Mr. Wm. T. Hall, agent, College Hill, Shrewsbury.

West Ham.—Jan. 17.—For the extension of the existing West Silvertown schools and the erection of the boys' new department. Deposit 5*l.* Apply by Jan. 1 to Mr. William Jacques, A.R.I.B.A., architect to the education committee, 2 Fen Court, Fenchurch Street, E.C.

Workington.—Jan. 14.—For the demolition of the Queen's Arms and adjoining cottages, King Street, and rebuilding of the inn on the site. Mr. Edwin J. Knight, secretary and manager, Messrs. Thomas Salt & Co., Ltd., brewers, High Street, Burton-on-Trent.

Yorkshire.—Jan. 10.—For the following works for the East Riding of Yorkshire education committee, viz.:— (*a*) Erection of a Council school to accommodate 133 children, and teacher's house, at Stamford Bridge; (*b*) alterations and additions to the Council school at Burton Pidsea. The Building Surveyor, County Hall, Beverley.

Mr. Colin Macandrew, contractor, Edinburgh, has been successful in securing from the Commissioners of H.M. Works, &c., the contract for the completion of the adaptation of the Royal Institution Buildings for the Royal Scottish Academy Galleries. The total amount to be expended in the entire conversion of the buildings, it is expected, will reach about 20,000*l.*

TENDERS.

BENTLEY.

For erection of a cottage at Bentley sewage works, Doncaster. Mr. P. N. Brundell, architect, Doncaster.

Sprakes & Son	£400 0 0
Swann	388 0 0
Beastall & Sons	385 0 0
Smith & Fritchley	332 9 0
Booth	310 0 0
Flowitt & Gilbert, Balby (*accepted*)	309 10 0

BIRMINGHAM.

For the erection of a Council school in Charles Arthur Street, Nechells.

Webb & Son (*accepted*)	£10,595 0 0

CHATHAM.

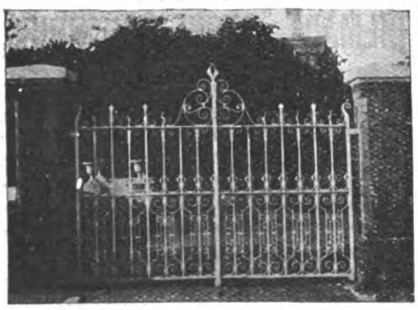
For erection of a corn-grinding building at the workhouse. Mr. E. J. Hammond, architect, Gillingham.

Osborne	£550 0 0
Hammond	480 10 6
H. A. Phillips	440 10 0
Horne	403 11 9
Skinner	392 0 0
Baker & Son	389 0 0
Filley	371 0 0
H. E. Phillips	369 0 0
Webb	360 0 0
West Bros.	356 0 0
Gates & Son	355 0 0
Leonard, Rochester (*accepted*)	340 0 0

GRIMSBY.

For Humberstone sewage works. Mr. A. Hobson, surveyor, Grimsby.

Hewins & Goodhand	£995 12 0
Brebner & Co.	798 15 0
Parker & Son	797 10 0
Wickstead & Co.	722 0 0
Jenkinson	711 0 0
Allison	707 0 0
Brumby, Robinson & Son	659 0 0
Sangwin, Hull and Grimsby (*accepted*)	608 0 0

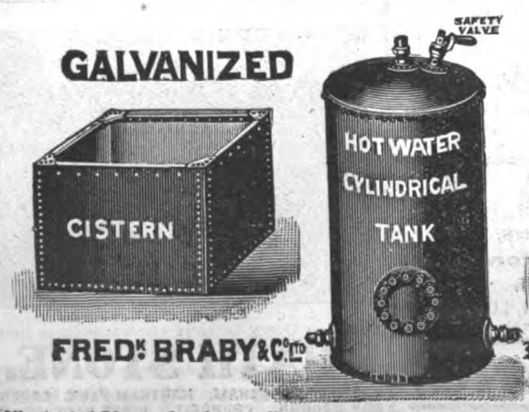


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Accepted tenders.

Nettleton, mason	£2,175 15 3
Carrick, joiner	810 0 0
Allan, plumber and glazier	222 0 0
Atkinson & Son, slater	160 0 0
Fortune, plasterer	148 16 6
Brown, painter	69 10 0

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For the construction of a tunnel for foot passengers under the Thames between North and South Woolwich for the London County Council.

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Pearson & Son	104,856 14 8
Griffiths & Co.	96,542 1 0
Muirhead & Co.	92,743 10 6
Price & Reeves	92,600 0 0
Cochrane & Sons	91,032 2 1
Whyte & Co.	85,135 19 6
Mowlem & Co.	80,506 0 0
Scott & Middleton, 28 Victoria Street, S.W. (*recommended*)	78,860 7 1

For providing and fixing two boilers and low-pressure hot-water heating apparatus at the Marner Street school (Bow and Bromley).

Grundy	£897 0 0
Wontner-Smith, Gray & Co.	892 5 0
Pemberton, Arber & Carey	885 10 0
Stevens & Sons	868 0 0
Brightside Foundry and Engineering Co.	821 0 0
Mackintosh & Sons	819 0 0
Yetton & Co.	813 0 0
Tilley Bros.	786 1 6
Cannon & Sons	745 0 0
Christie	740 0 0
G. & E. Bradley, 77 Lever Street, E.C. (*recommended*)	723 10 0
Architect's (Education) estimate	777 0 0

LONDON—*continued.*

For the execution of the roadwork and platelaying, exclusive of the supply of rails and special trackwork, in connection with the construction on the overhead trolley system of the tramways from Beresford Square, Woolwich to Eltham.

Trentham	£42,455 3 0
Jackson	40,196 16 11
Griffiths & Co.	40,190 11 1
Manders	40,040 10 10
Kirk & Randall	38,331 0 0
Brebner & Co.	37,332 1 6
Mowlem & Co.	36,725 0 0
Blackwell & Co.	36,662 16 9
Dick, Kerr & Co.	33,226 1 6
Stark & Sons, Glasgow (*recommended*)	32,528 4 6
Chief Engineer's estimate	35,470 0 0

For the execution of the roadwork and platelaying, exclusive of the supply of rails and special trackwork, in connection with the reconstruction, on the underground conduit system, of the tramways in Woolwich Road, Albion Road, and George Street between Rainton Road and Chapel Street, and the construction on the same system of traction of the authorised tramways in Farringdon Road between Clerkenwell Road and Charles Street.

Trentham	£46,657 6 8
Brebner & Co.	44,948 5 2
Manders	44,266 2 8
Mowlem & Co.	41,046 19 7
Dick, Kerr & Co., Abchurch Yard (*recommended*)	40,792 12 7

For the manufacture, supply and erection of overhead electrical equipment required in connection with the construction on the overhead system of the tramways from Beresford Square, Woolwich, to Eltham.

The National Electrical Construction Co.	£6,056 9 7
Dick, Kerr & Co.	5,908 15 6
Blackwell & Co.	5,900 14 0
Smith	5,870 0 9
British Insulated and Helsby Cables, Prescot (*recommended*)	5,760 1 4
Chief Officer of Tramways estimate	6,900 0 0

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LONDON—*continued.*

For building a block of shops in Uxbridge Road, Shepherd's Bush, W. Mr. F. H. Witts, M.S.A., architect and surveyor, 39 Agate Road, Hammersmith, W.

Kingerlee & Sons, Queen Street, Oxford (*accepted*)	£6,590 0 0

For erecting an iron fire-escape staircase at workhouse in Woodfield Road, Harrow Road, W., for Paddington Guardians. Mr. E. Howley Sim, architect, Mowbray House, Norfolk Street, Strand, W.C.

Aston & Sons	£252 0 0
Bromsgrove Guild of Applied Arts	165 15 0
Mackenzie & Moncur	153 10 0
Ritchie & Co.	149 15 6
H. & S. Jones	139 18 0
Wright	130 0 0
Wallis	129 0 0
Jones & Co.	126 15 0
Falkirk Iron Co.	125 19 6
Lion Foundry Co.	122 16 0
Cadogan Iron Works	120 0 0
Banbury	114 19 0
Barrett & Power	112 0 0
Haward Bros.	102 5 0
Hayward Bros. & Eckstein	99 17 6
Herring & Son	99 17 6
General Iron Foundry Co., 43 Upper Thames Street, E.C. (*accepted*)	99 10 0

LOUTH.

For erection of a museum in Engine Gate. Mr. J. G. Creswell, architect, Grimsby.

Mawer Bros., Louth (*accepted*)	£529 12 6

SAFFRON WALDEN.

For erecting a public swimming bath in Hill Street. Mr. A. H. Forbes, Borough Surveyor, Saffron Walden.

Wyatt	£1,550 0 0
Thackeray & Co.	1,488 0 0
Custerson	1,365 0 0
Green & Parsons	1,331 12 0
Glasscock & Son, Bishop's Stortford (*accepted*)	1,290 0 0

MIDDLESBROUGH.

For the erection and completion of public library in Dunning Street. Messrs. Russell & Cooper, architects, 11 Gray's Inn Square, London.

Radge	£14,130 0 0
Davidson & Miller	13,279 0 0
Nicholson & Son	13,133 1 9
Doughty & Sons	13,035 0 0
Howe & Co.	12,875 0 0
Wilson	12,694 1 1
Hudson Bros.	12,550 0 0
Coates	12,435 13 2
Lumsden	12,232 0 0
Quibell, Son & Greenwood	11,857 9 0
Allison Bros.	11,799 11 6
Arnold & Son	11,766 0 0
Rhodes	11,597 0 0
McNaughton, Middlesbrough (*accepted*)	11,566 8 0

RAMSEY.

For erecting a Council school, Mereside, Hunts. Mr. Herbert Leete, County Surveyor, Huntingdon.

Cracknell	£2,198 0 0
Hawkins & Son	2,040 0 0
Alcock	1,983 10 0
Saint & Sons	1,897 16 0
Bridgefoot & Son	1,890 0 0
Page & Son	1,880 0 0
Allen & Sons	1,860 0 0
Thackeray & Co.	1,828 10 0
Giddings	1,786 0 0
Rose & Sons	1,776 13 9
Gray	1,755 0 0
Shanks	1,730 0 0
Guttridge & Sons, Peterborough (*accepted*)	1,719 0 0

SLEEKBURN.

For new vicarage, parish room, boundaries, &c., at Sleekburn, Northumberland. Mr. Plummer, F.R.I.B.A., diocesan architect.

Goulding & Son, Blyth (*accepted*).

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READING.

For the erection of new offices for the Berkshire County Council. Messrs. WARWICK & HALL, architects, Gray's Inn, W.C.

Hollis & Sons	£19,360 0 0
Cox & Sons	18,731 0 0
Cooper & Sons	18,695 0 0
Hoskings Bros.	18,689 0 0
Collier & Catley	18,532 0 0
Wheeler Bros.	18,295 0 0
Mussellwhite & Sapp	18,230 0 0
Fitt	17,937 0 0
Foster & Dicksee	17,935 0 0
Newberry	17,500 0 0
Holliday & Greenwood	17,380 0 0
Holloway Bros.	17,250 0 0
Seward	17,008 0 0
Killby & Gayford	16,958 0 0
Watson Bros.	16,444 0 0
HUGHES, Wokingham (*accepted*)	16,398 0 0

SCOTLAND.

For alterations and additions on Culvie school, for the Marnoch School Board.

Accepted tenders.

Beattie, mason	£185 3 11
Brodie, carpenter	144 18 4
Watson, plumber	39 10 5
Hutcheson & Co., slater	29 19 0
Clark, plasterer	17 8 4
Chalmers, painter	13 17 5

WARMINSTER.

For additions to Sandhayes Corsley. Mr. A. F. LONG, architect, Warminster.

Franklin	£813 0 0
Moore & Sons	743 0 0
Pearce	689 0 0
Seaward	680 9 0
Butcher & Sons	654 18 0
Curtis & Son	624 0 0
PARSONS BROS., Station Road, Westbury, Wilts (*accepted*)	577 0 0

WALES.

For new juniors' building, North Edward Street, Cardiff, for the Y.M.C.A. Messrs. SPEIR & BEAVAN, architects, Borough Chambers, Wharton Street, Cardiff.

James & Norris	£4,500 0 0
E. D. W. Evans	4,360 13 6
Howells	4,360 0 0
Stephens & Co.	4,329 0 0
Haynes	4,250 0 0
Griffin & Sons	4,338 17 6
Blacker Bros.	4,179 0 0
Thomas & Co.	4,073 0 0
E. R. Evans & Bros.	4,049 0 0
Davis & Sons	4,038 0 0
Knox & Wells	3,993 0 0
Allan & Co.	3,922 0 0
Tucker Bros.	3,917 8 1
Gough Bros.	3,880 0 0
Symonds	3,850 0 0
TURNER & SONS (*accepted*)	3,798 0 0
Morgan	3,697 0 0

For erecting a schoolmaster's residence, Llanfihangel-Glyn-Myfyr, Denbighshire. Mr. WALTER D. WILES, county architect and surveyor, 42A High Street, Wrexham.

W. H. Thomas	£655 4 7
Owen	550 0 0
Jones & Son	543 0 0
T. THOMAS, Maerdy (*accepted*)	527 15 0

WORTHING.

For the construction of a roof to the tipping platform at the refuse destructor. Mr. F. ROBERTS, borough surveyor.

Baker	£144 18 0
Sandell	144 0 0
Crane	143 10 3
Sandell & Sons	138 0 0
Bostel Bros.	135 0 0
Nadin	134 14 6
HERBERT, Worthing (*accepted*)	131 1 5

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RECENT TESTIMONIAL.

[Copy] 46 Newcastle St., London, E. June 8, 1909.

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J. H. STONEHOUSE, Director.

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TRADE NOTES.

Messrs. Sprague & Co.'s pocket-book, which is so well known to architects and surveyors, is for the new year, 1910, more valuable than ever, as there have been added lists of the principal officers, the members of Council and the committees, together with the dates and particulars of meetings of the Royal Institute of British Architects, the Architectural Association, the Surveyors' Institution, the Society of Architects, and the Quantity Surveyors' Association. It is rather hard on Messrs. Sprague that they should find their publication of the list of His Majesty's Ministers followed immediately by a General Election, which may possibly render the information incorrect.

Messrs. Smith, Major & Stevens, Ltd., have just been instructed by the Lords Commissioners of the Admiralty to supply and erect on board the new Dreadnought battleship H.M.S. *Neptune* four of their electric passenger lifts, the order having been obtained after an exhaustive enquiry into the merits of the lifts in question.

The balance sheet of the Saxon Portland Cement Company, just published, shows the company has had a most successful year. After paying Debenture interest and 6 per cent. upon the Preference shares, there remains for distribution 5,628*l*., a sum equal to 22½ per cent. upon the ordinary share capital of the company.

VARIETIES.

A new out-patients' department is to be erected at the Dundee Royal Infirmary at a cost of 3,800*l*.

The North British Academy of Arts are to hold their second exhibition at the Corporation Art Gallery, York, in January. The first annual exhibition was held at Newcastle.

The Plymouth Town Council have referred back for further consideration a decision of their special works committee to prohibit the use of hollow concrete blocks.

Mr. W. Noble Twelvetrees, M.I.Mech.E., &c., has removed to 195 Bedford Hill, S.W. His telephone number remains as before, viz. 1221 Battersea.

New buildings are to be erected for the Swanley and District Working Men's Club and Institute, at Swanley, Kent, during the early part of the year, at a cost of 2,000*l*.

The retort houses at the Municipal Gas Works, Burton-on-Trent, are to be partially reconstructed at a cost of 16,000*l*. The original scheme involved an outlay of 25,000*l*.

Mr. J. Keanie, contractor, Johnstone, N.B., has been awarded the contract for carrying out a sewage purification scheme at Johnstone, N.B. The amount involved is about 10,000*l*. There were about thirty other tenders.

The Wood Green District Council has decided to apply to Parliament for power to sell a public garden of 3 roods 14 poles, for which a music-hall syndicate has offered the council 8,000*l*.

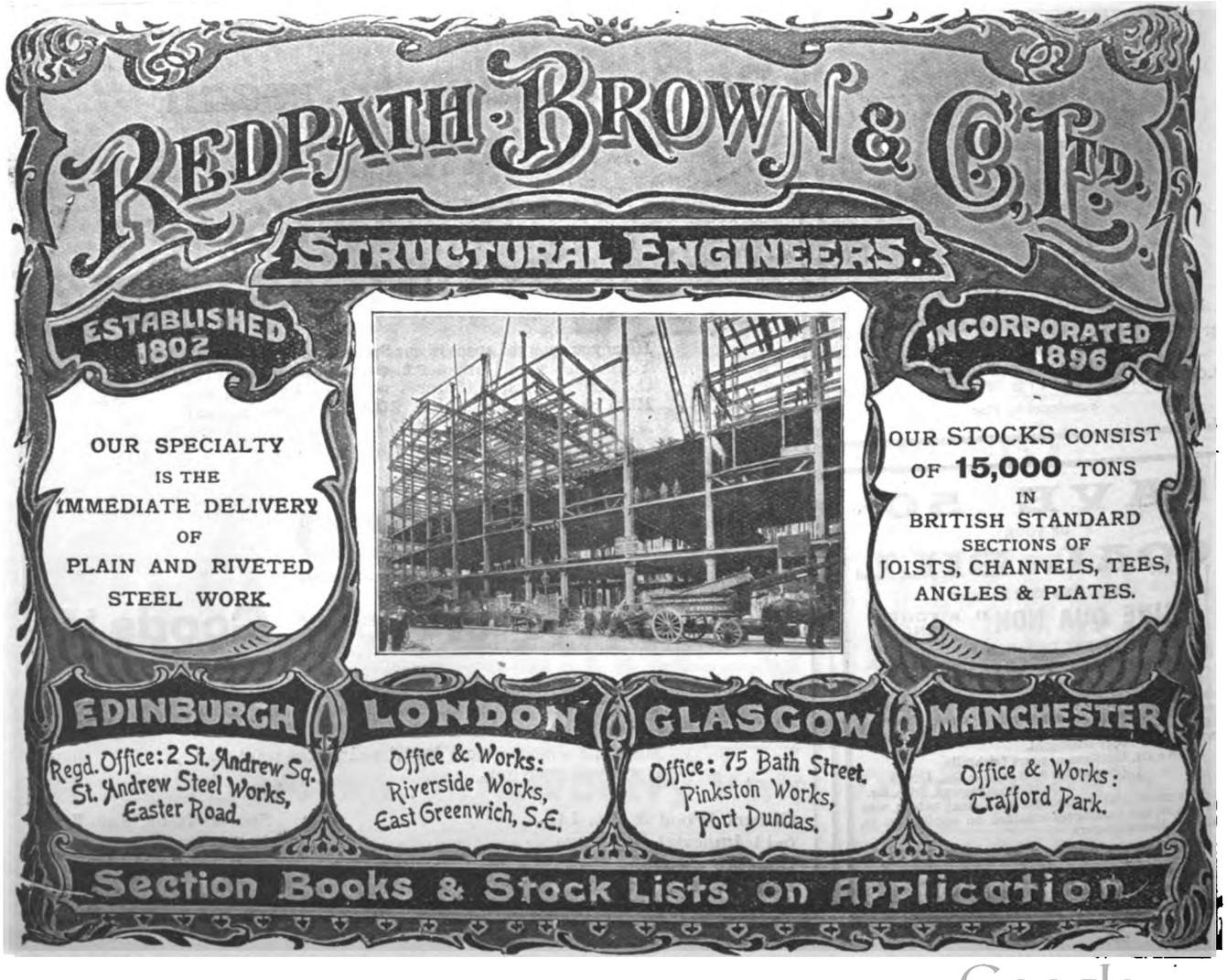
Messrs. Hobday, Way & Co., engineers, of London and Birmingham, have purchased a big site at Northampton, known as Abbey Park, with the idea of erecting works on it at an early date. Mr. G. H. Stevenson, architect, Northampton, is acting for the purchasers.

Mr. C. A. Harrison, M.Inst.C.E., of Newcastle-on-Tyne, is to be engaged to examine and report upon the designs and schemes submitted to the Valley Bridge sub-committee, Scarborough, for the widening and strengthening of the Valley Bridge, which spans the valley dividing the South Cliff from the railway station and Scarborough.

The foundation stone was recently laid of the Grenville Hotel, of eighty rooms, at Bude. A wide verandah will extend along the whole of the south front, and in the centre is to be a tower with a flat roof. There will be two principal staircases, one at each end of the corridor, leading to the three floors above. The hotel is being built by Messrs. Pethick Bros., of Bude, from the plans of Mr. Hatchard-Smith, architect, London.

The Belfast Corporation last week adopted a scheme put forward on behalf of the joint public health and improvement committees, recommending the application for a loan of 96,000*l*. for the extinction of the existing slum areas in the centre of the city, the widening of certain thoroughfares, and the provision of breathing spaces in the interests of the general health of the community. It is calculated that the 2,000*l*. per annum required for the sinking fund and interest will be recovered from the increased rents.

Arrangements are being made to acquire from the Corporation of Dunfermline about twelve acres of moorland to



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ILLUSTRATIONS.

COMPETITION DESIGN FOR TRAINING COLLEGE, HULL.

QUENBY HALL, LEICESTERSHIRE.

INFANT SCHOOL, BRIDGEND.

SOUTH DOOR, PATRIXBOURNE CHURCH.

the south-east of Townhill for the purpose of forming a "garden city," in accordance with the ideas of the Garden City Association. A number of local gentlemen have subscribed or promised 15,000*l.* It is proposed to erect a large number of houses which can be let at from 9*l.* to 11*l.* a year. The site is nearly two miles from Dunfermline proper, but it is not far from the recently introduced tramway system between Dunfermline and Townhill.

THE Northern Counties Federation of Building Trade Employers held their annual general meeting on the 16th inst. at Sunderland, under the presidency of Mr. J. Davison, of Stockton-on-Tees. The annual report stated that the local associations had maintained their position and had increased their membership. A canvass had been made amongst the sub-trades and merchants, many of whom had joined the association on the strength of the adoption of an inter-trading rule, as well as being able to rely upon the advantage of a strong and active federation. The election of officers resulted as follows:—Mr. Alexander Ross, South Shields, president; Mr. F. W. Ranken, Sunderland, vice-president; Mr. J. W. White, hon. treasurer. It was agreed to hold the next quarterly meeting at North Shields.

THE Cardiff technical schools committee received last week deputations concerning the proposed formation of a class for gasfitters. A deputation of operative and master plumbers objected to the teaching of joint-wiping; and, for the gas company, it was said that owing to the changes that had taken place in the utilisation of gas for heating and motive purposes gasfitters required to know more than had been previously required of them. After prolonged discussion it was decided to defer conclusion until the committee had obtained the advice of the City and Guilds of London Institute as to what could properly be included in a syllabus for plumbers and what in a syllabus for gasfitters.

MR. E. A. SANDFORD-FAWCETT, Local Government Board Inspector, held an inquiry at Chester on the 15th inst. regarding an application made by the Cheshire County Council for sanction to borrow 82,000*l.* for the extension of Upton Lunatic Asylum. Among the officials present was Mr. H. Beswick, the county architect. In course of the inquiry it was stated that the sum of 275,000*l.* had already been spent on the building. Accommodation is to be provided at Upton for 500 additional patients, of whom 100 would be private or paying patients. It is intended to build a new annexe for 440 patients and an epileptic ward for sixty female patients. Extensions are also required to the laundry and chapel. The estimated cost of the annexe is 65,891*l.*, and the female epileptic ward 5,328*l.*

THE Glasgow Institute of Architects held a meeting in the secretary's chambers, 115 St. Vincent Street, on the 15th inst., Mr. George Bell, F.R.I.B.A., president, in the chair. The Secretary submitted a report on the matters which had been dealt with by the Council since last meeting. A committee of the Council is at present considering the proposed new building by-laws framed by Glasgow Corporation. The arrangements for the Institute's exhibition of architectural work, to be held in the rooms, 35 Elmbank Crescent, are now almost completed, and the opening ceremony has been fixed for the evening of January 7 next. The Institute has decided to hold a special general meeting on the evening of January 12 to consider the subject of "Competitions," and Mr. A. N. Paterson, M.A., A.R.I.B.A., has agreed to open the meeting by delivering a paper on the subject.

TREVELYAN HALL, St. Ann's Lane, Westminster, was recently dedicated by the Bishop of Kensington. It adjoins the mission buildings of St. Matthew's. On the ground floor, in addition to the kitchen and an enlarged parish workers' room, are rooms for the parish nurses, waiting-room, boiler-room and lavatories. On the first floor, approached by a separate entrance, is the Trevelyan hall, of some 1,560 super feet. It is divisible by a large revolving partition. A painting by E. de Morgan entitled "Attainment" is the chief ornament of the interior. The wood dado and ceiling ribs

WHAT IS EXPERTS' OPINION OF **URALITE AND ASBESTONE?**

A PAVILION CONSTRUCTED OF THESE MATERIALS HAS BEEN AWARDED A DIPLOMA FOR GOLD MEDAL BY THE SUPERIOR JURY OF THE IMPERIAL INTERNATIONAL EXHIBITION AT THE GREAT WHITE CITY.
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are painted a dark green, and the walls will be distempered a pale green. The building is warmed by hot-water radiators and lighted by electricity, a secondary system of gas lighting being provided. There are two emergency exits and staircases, as well as the main staircase. The frontage to St. Ann's Lane is terra cotta with some glazed brick. Messrs. Mark Fawcett & Co., Greenwich, were the sub-contractors for the fireproof flooring and steel roof principals. The work has been carried out from the designs of Mr. Harold S. Rogers, architect, of 7 Dean's Yard, by Messrs. F. C. Hoskins & Co., of 4 Tufton Street, S.W.

CALENDARS, DIARIES, &c., FOR 1910.

We have received calendars from the Federated Employers' Association, 8 King Street, Manchester. That of the Western Electric Company has the disadvantage of failing to show the date clearly except at a very short distance, as space reserved for the months is only a small portion of the whole mount. The Art Calendar of Messrs. Shaw & Sons, stationers, Fetter Lane, E.C., shows in the centre a well coloured sunset scene on the coast. The London and Lancashire Fire Insurance Company opportunely give a reminder on each page of their calendar as to the date in that particular month on which the various insurances expire (it might here be mentioned that the security of the firm amounts to over four and a half millions); this company also send us a very useful memorandum block, with a detachable page for every day of the year. It has been often said that handsome premises are one of the finest assets for any company; this truism is evidently acknowledged by the Edinburgh Life Assurance Company, for they put at the head of their admirably spaced calendar a view of their new head office at 26 George Street, Edinburgh, which has already been described and illustrated in *The Architect*; intending policy-holders will be interested to know that policies issued by December 31 at full yearly rates will rank for four full years' bonus additions at the division of surplus to be made on December 31, 1912; the company have divided over 3,150,000*l.* as bonuses since their foundation in 1823. A standing and hanging circular calendar comes from Messrs. W. Summerscales & Sons, Ltd., Phœnix Foundry, Keighley; the monthly cards extend to December 1911.

The City Diary, 1910 (the *City Press* Office, E.C., price 1*s.*) must have now firmly established itself in the desks and bookshelves of City men. The diary proper, with three days to a page, is inter-leaved with blotting-paper, and the binding will stand business wear and tear. The preliminary section affords full information as to each of the local authorities, &c., operating in the "one square mile." The members of the Corporation are stated alphabetically, and according to the wards; there is a full list of City churches and their incumbents, and details are given as to the Guilds. The other municipal, social, and philanthropic organisations of the City all come within its purview.

The Gloucester Railway Carriage and Wagon Company, Ltd., have issued their fifteenth "Gloucester" Diary. About one-half of the three hundred odd pages deal with matters connected with the company.

A waistcoat pocket diary has been issued by the Saxon Portland Cement Company, Ltd., Cambridge, which in a compact space provides room for much valuable note-making by a business man. A coupon in a pocket gives special facilities for insurance. A very neat stamp and ticket case in Russian leather, together with a diary for January, comes from the London and Lancashire Fire Insurance Company; the diary has all the usual information, and some more besides.

Another useful present is the handy blotting pad and diary of the Edinburgh Life Assurance Company.

CRYSTAL PALACE SCHOOL OF ENGINEERING.

The 111th award of certificates to the students took place at the lecture theatre, Crystal Palace, on Friday, December 17, when Mr. W. M. Mordey, M.I.C.E., presided and delivered an instructive address to the large company present on the occasion. He said that it was extremely desirable that

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engineers should be able to do mechanical work and take off their coats to do a job whenever it was requisite. The ability to do the minor details of work tended to efficiency, and whatever their remuneration was they should by their strenuousness make it palpable to their employers that they were worth all they got, or more. It was also desirable that they should keep posted well up to date in the knowledge of their work, and that they should at the same time acquire a high moral character, so as to reflect credit on the profession of engineering.

The long list of appointments gained by students of this school has recently been added to by a supplementary list which includes some very important and responsible positions, among which are the following:—C. R. S. Kirkpatrick, chief assistant to the London Port Authority; A. R. Roberts, assistant engineer to the Leith Dock Commission; B. Marsland, chief Government engineer, Queensland Railways; H. Sadler, resident engineer, Dover Admiralty Pier widening; A. S. Buckle, district engineer, Ceylon Government railway; J. L. Dixon, resident engineer, Aden Waterworks construction, Aden; H. M. Birch, executive engineer, P.W.D., British East Africa; J. D. Wilson, resident engineer, Grand Trunk Pacific Railway, British Columbia; J. G. Nachaty, first assistant engineer Egyptian State railways; C. O. Weller, chief assistant engineer, Bonguolla Railway, S.W. Africa.

CORRESPONDENCE.

[The Editor will not be responsible for the opinions expressed by Correspondents.]

Fresco Painting.

SIR,—With reference to the various articles *re* "Fresco Painting" that appeared in your last three issues, it will no doubt interest your readers to hear the opinion expressed by the late Mr. Fred. S. Barff, Professor of Chemistry to the Royal Academy, on the renowned durability of four paintings executed according to the famous "Keim process," by the Rev. J. A. Rivington:—

"The Rev. J. A. Rivington gave me four specimens of his painting to submit to any tests I pleased. Three of these were half protected and half exposed. No. I. was treated by me in the exposed part, first with a solution of oil of vitriol, one part oil of vitriol to four parts of water, for some minutes, after which I washed it in cold water. It was then treated with bromine water for some minutes; after that, to destroy the yellow tint given by the bromine water, and to further test it, it was washed with a solution of strong caustic soda. A few days after it was treated with saturated chlorine water. These tests proved that the protecting influence of the silicates is very great. Chlorine and bromine do not occur in the air, but they are most powerful bleaching agents, and therefore rapidly destroy unprotected colours.

"No. II. was kept moist for some time under a bell glass full of carbonic acid gas. I then placed it in water through which carbonic acid was passed continuously for twenty-four hours. This proves that the lime ground can resist the most powerful disintegrating agent which exists in the air.

"No. III. was placed for a week in a bell glass of sulphurous acid gas, and kept moist. The result is, that it resisted this most powerful disintegrating gas; it also resisted its bleaching powers. Sulphurous acid destroys substances by its becoming oxidised in the presence of moisture into sulphuric acid, which, continually applied, has a most destructive effect.

"My opinion, therefore, is that painting properly executed with these materials will resist the destructive influences in the air. The fourth specimen proves that however dirty a painting in these materials may become, it can be made as fresh as when new by simple washing.

"I have studied silicious painting for thirty years, and have therefore had some experience.

"FRED. S. BARFF, M.A., Cantab."

Mr. Frederick Shields gave his opinion on this process as follows:—

"The Keim process lends itself with fascinating facility to every purpose of the painter. There are no ditches and pitfalls. He may go straight ahead with his work, from beginning to end, at a sitting, or he may go on to-morrow to perfect what he has begun to-day. You lay your first touch tentatively; the ground sucks it in; you go on; you are astonished, you are delighted with the sympathy between the ground and the colours flowing from your brush. As you gain confidence you find that hue may be laid over hue in

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SAMPLES SENT ON APPLICATION.

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clear translucent veils, as in pure water colour, without disturbing any of the under tints, and that the materials allow you to finish at once with a result brilliant and forcible, and astonishingly like pure fresco.

"White may be used for the lights, and glazed to any hue afterwards, adding to the solid appearance of the painting.

"Further, I can only say that if the report of the chemical authorities may be relied upon, concerning the durability of this process, especially under the evil conditions of the atmosphere of modern cities, so injurious to all previous methods of mural decoration, then one may boldly say 'This is what the ages have waited for. At last, Eureka!'

"FREDERICK SHIELDS."

In recent years the "Keim process" has been commercially exploited, and a new paint, based on the same principles, and possessing the same durable, weatherproof and artistic properties as the "Keim colours," has been brought upon the market under the name of "Perpetuin Mineral Paint," and is claimed to be the only paint of its kind in this country. It is equally suitable for artistic paintings and frescoes, as well as for ordinary painting of walls, both inside and outside.

I may add that Messrs. Pattenhausen Bros., 40 Great Tower Street, E.C., are the sole agents for the "Keim" colours, as well as for "Perpetuin" mineral paint, in case any of your readers might wish to apply for further particulars.—Yours respectfully, A. R. TROBST.

8 Crouch Hall Road, Crouch End, London, N.: Dec. 16.

GERMAN ERRORS IN TOWN PLANNING.*

To insure that the powers given by the Town Planning Act shall be rightly used, all who know what are the evils existing both in our towns and in foreign towns should do their best to spread their knowledge and to try to induce our town councils and the Local Government Board to use their new powers very fully, but in doing so to avoid the mistakes which have been made and are still being made abroad.

* Abstract of a paper prepared by Mr. T. G. Horsfall in connection with the National Town Planning Congress held at the Westminster Palace Hotel, S.W., on December 14 and 15.

Fortunately the whole subject has been very carefully studied during the last thirty years by many German students of sociology and members of German municipal authorities. The results of much of the best German investigation have been conveniently summed up in courses of lectures on "Town Building," which were begun last year, and are being continued this year, at the Royal Technical University in Berlin.

Another lecture needs special mention on account of its very great value for English students of town planning. Bremen is the only large German town (228,000 inhabitants) which has houses resembling in size those in English towns. In the year 1880 its houses contained on an average 7.1 persons each, while the average for Berlin was 44.9, as compared with London 7.9 and England (without London) 5.8. But Bremen, like London, has been invaded by tenement houses, and the average number of inhabitants for one house reached 7.6 in 1890. Bremen has hitherto not had detailed town plans, but, partly in the hope of preventing the further replacement of cottages by tenement houses, it is now thinking of preparing them. The address referred to is by Professor Dr. Eberstadt on "Questions of Town Extension in Bremen and their General Significance," and was delivered to the Association of Architects in Bremen. Dr. Eberstadt has studied the housing question very carefully both in England and Germany; he is convinced of the great superiority of cottages to tenement houses, and the advice and warning which he has given respecting the use of town plans to the people of Bremen are as relevant to our needs as to theirs.

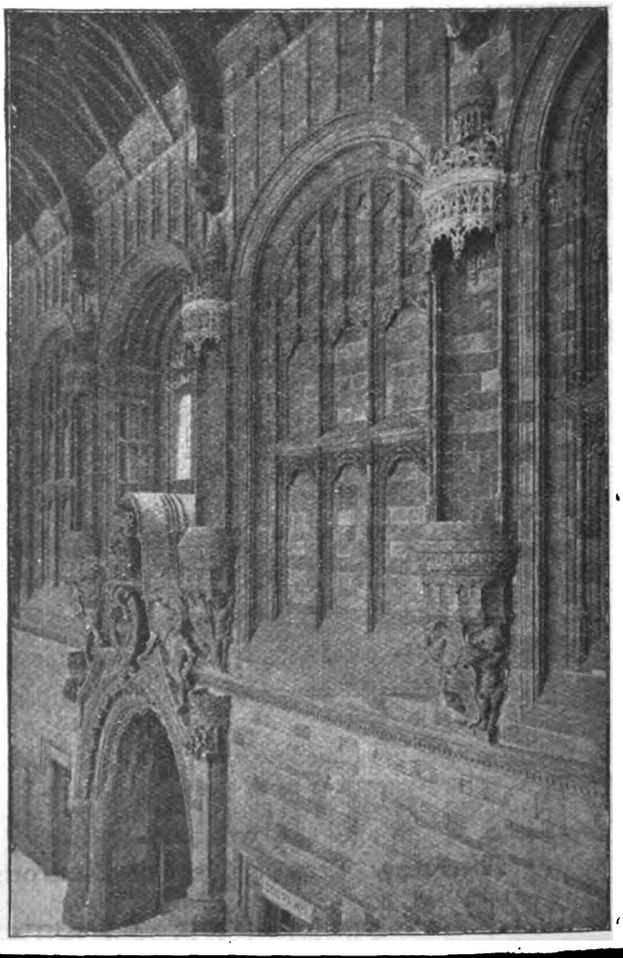
In the first lecture of the first series of Berlin lectures Professor Joseph Brix, discussing "The Objects of Town Building," says that to the domain of town building, for which town plans are needed, belong those parts of technical and artistic activity which seek to provide human beings with sites for their dwellings in harmony with the degree of civilisation attained by them, and to give them all that is needed as the foundations of healthy domestic life. The task of constructing and completing the individual house is that of the architect and of the decorator. The town builder is concerned only with the questions which rise when the mutual relations of the various dwellings and other buildings required by the community have to be determined. The questions which have to be dealt with may be classified under the head-

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ings economic, hygienic, constructional, administrative, legislative, and, not least important, artistic or æsthetic.

As to how town plans can enable this to be done, German works on the subject give much valuable information. But it must be borne in mind that the town plan is only an instrument for attaining objects which its creators wish to attain. Some years ago the late Mr. Beck, for many years the Oberburgermeister of Mannheim, said that it is one of the duties of a community to give some compensation to the working classes for the smallness of their houses by providing every part of a town with planted walks, shrubberies, and playgrounds. Last year the Burgermeister of Gelsenkirchen (Herr von Wedelstaedt) said that, though no special laws prescribe it, there has been created for towns the sacred duty of protecting the health of the nation within their walls, and of insuring that workpeople and all citizens shall really find a home there in which life is worth living.

Professor Brix's remarks respecting the effect of the right formation of streets, of the use of the curve when it is appropriate, and the provision and right shaping of an adequate number of shrubberies and other open spaces should be carefully considered by all who can directly or indirectly influence the preparation of town plans.

Professor Genzmer rightly attributes to the breaking with tradition the dulness and monotony of the new districts of some of the German towns, the extension plans of which were prepared in the early years of the revival of town planning. The old towns, which ought to have been taken as models, were so full of beauty, he says, that probably beauty was supposed to be a thing which comes of itself. Towns are, he tells us, the form in stone of human culture, the most expressive monument of human history. The Germans have now recognised, says Professor Genzmer, that towns chiefly serve as dwelling places for beings who are not simply earners of money, but who enjoy life and beauty; and, following the impulse of their hearts, strive to create for their comfortable homes an environment ennobled by art.

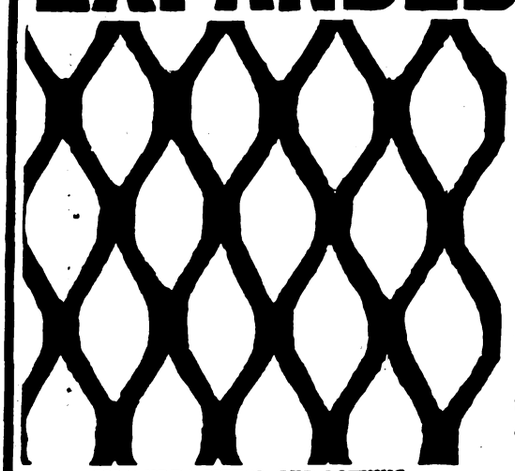
Respecting the protection of health Professor Brix speaks of the need for insuring that enough light and sunshine shall reach all the inhabitants of towns and their dwellings, that tree-shaded roads and open spaces shall offer protection in hot weather, that wide spaces of grass shall exist to purify the air, that manufactories shall be confined to districts on the leeward side of towns, that sites shall be reserved for convalescent homes and forest schools, that there shall be an abundant supply of playgrounds and playing fields, and that too tall houses shall not be used as dwellings.

Those who wish to study this side of town planning more fully will find a perfect treasure house of suggestion in the works of Camillo Sitte, of Karl Henrici, and of Professor Stuebben, and also in the pages of the monthly magazine, "Der Staedtebau," which is now in its sixth year of publication. As Camillo Sitte's book has been translated into French under the title of "L'Art de bâtir les Villes," it may be of service to some persons who cannot read the other books.

Of all the reforms which can be effected by town planning there is no other more important than the supplying of a sufficient number of playgrounds and planted open spaces in the districts chiefly inhabited by workpeople. It cannot be doubted that by placing a playground, superintended by a well trained attendant to act as teacher of games as well as keeper of order, within reach of every child in our towns, we should effect a very great improvement in the physique, the intelligence, and conduct of our people. The German social reformers who demand a large supply of playgrounds in all new parts of towns, do not think of combating the weakness and disease due to wrong urban conditions simply by providing open spaces for play. Too often town children do not know how to use them rightly, or have no opportunity of using them. They are, therefore, making it obligatory that everywhere children shall give one afternoon a week to games in addition to two or three hours a week to gymnastics; and partly by the aid of the vast and active committee for promoting popular and children's games they have trained over twenty thousand teachers, men and women, to act as leaders of games.

Respecting building and the provision for traffic, Professor Brix urges that no extension of a town should take place except with the guidance of a plan prepared to provide for the probable needs of the next thirty years. This plan shall mark off (1) the land needed for roads, streets and public open spaces, and (2) the land which may be built on. The plan shall also divide the whole area into districts to be used respectively for residential, business and manufacturing pur-

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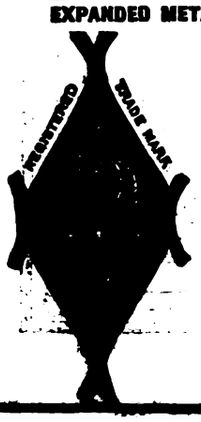
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poses. He recommends that, as a rule, existing roads shall be kept. Adequate means of cheap and rapid transit from dwelling places to workshops and to places of recreation must also be provided, so that the cost of the dwelling shall bear a right relation to the income of the occupant.

It is of immense importance that all who have any connection with the making of town plans shall from the first seek to make impossible the substitution of tenement houses for one-family houses. Safeguards must also be provided against the rise in the price of urban and suburban land, in cost of building and in rents of houses. Such an increase has taken place in most large, and in many smaller German towns, in great measure as a result of the adoption of wrong principles in the preparation of town plans.

A very few figures will indicate the terrible prevalence of the tall tenement house in German towns, and the comparative smallness of English dwellings. The average population of a house in Berlin is over 77; in Breslau, Koenigsberg, Chemnitz, Stettin, Dresden and Magdeburg, about 30; in London about 7.6; and in Manchester, Birmingham, Sheffield, Leeds and Liverpool from 5 to 6.

The difference between the price of urban and suburban land here and in Germany is remarkably great. Mr. Pohlman, who has lived both in Germany and in England, says that although London is a much larger city than Berlin, the cost of land at distances of from three to ten miles from the centre of Berlin is from three to ten times as much as that of land at corresponding distances from the centre of London, and Mr. Boehmert says that land costs as a rule four or five times as much in German towns as in English towns of the same population.

The rents and the selling prices of a given area or cubic space of dwelling are also much higher in large and small towns in Germany than in English towns of similar size, and rents in German towns rise as the income of the population rises in a way unknown in this country.

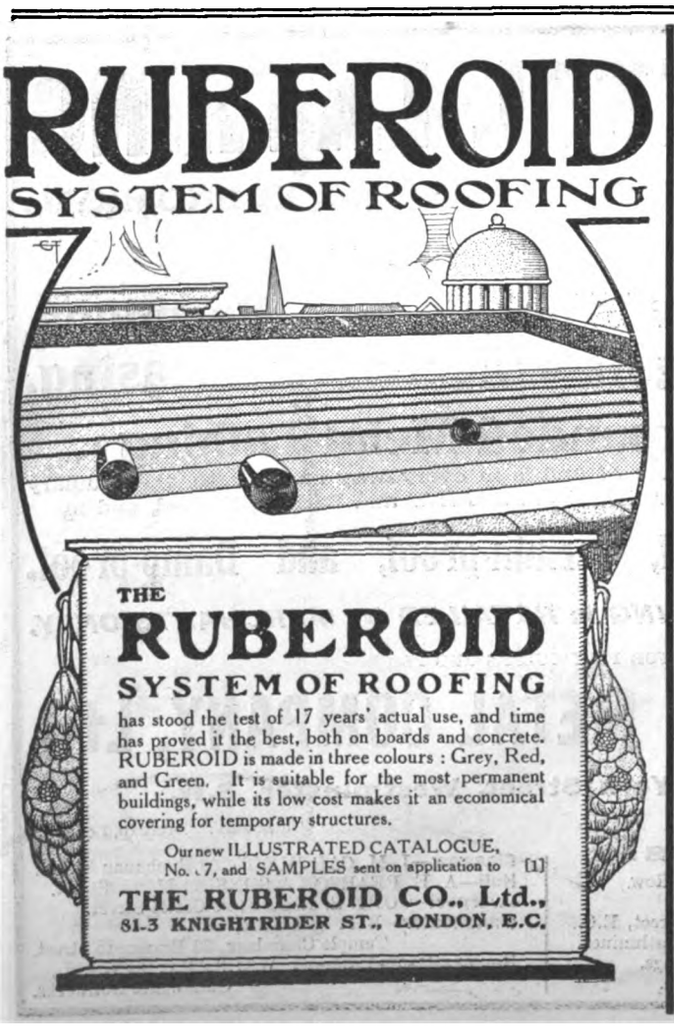
The high rents lead to terrible overcrowding in most large towns. Professor Fuchs of Tübingen, has stated that while of six million dwellings in this country, three millions have five or more rooms, four-fifths of the dwellings in the large towns of Prussia have not more than three rooms. There is, as we know, much overcrowding in London, but while there about 300,000 live in dwellings each of only one room, in smaller Berlin 700,000 live in dwellings of that size. It is not only the poorer part of the working class which in Germany suffers from the insufficiency of space in its dwellings. In many towns all classes up to the well-to-do middle class are compelled by the high level of rents to restrict the number of the rooms they occupy to a much greater extent than are the corresponding classes here.

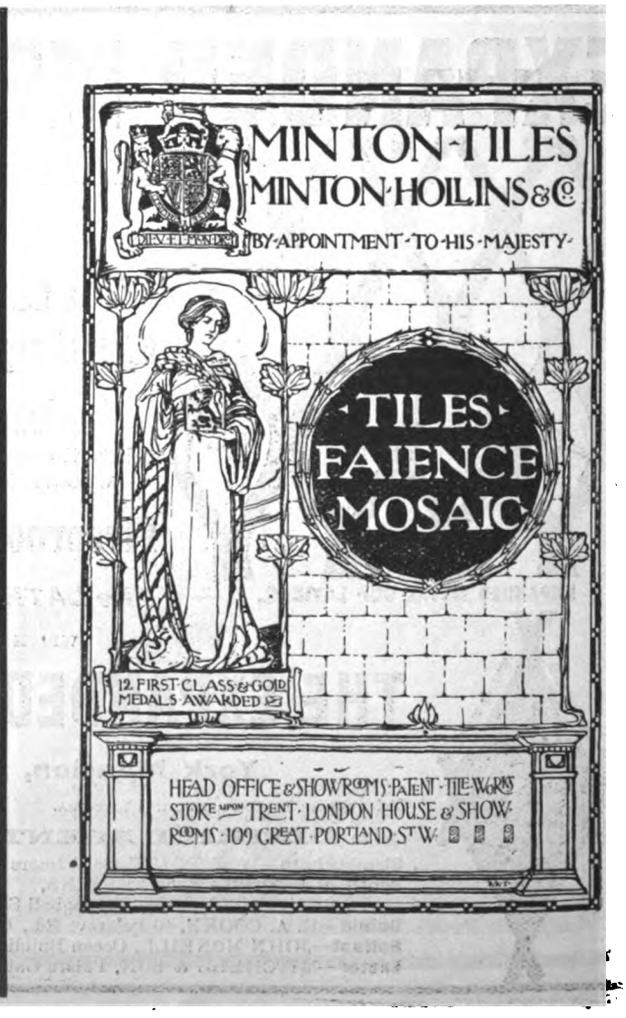
If similar evils are not to be created by town planning here, the causes of the evils which have been created in Germany must be known and avoided. Houses are sure to be made dearer than they would otherwise be:—(1) If the land on which they stand is of high price; (2) if an unnecessarily large quantity of material or an unnecessarily high quality of material or of workmanship has to be used in their construction; (3) if for any reason they are so large that but few persons can provide the capital needed for their construction; and (4) if either on account of houses being of great size, or because the area on which new houses can be built is restricted by municipal or other regulations, only a comparatively small number can be built at the same time.

All these causes of dearness are operant in German towns and suburbs. Land needed for sites is very dear; houses are so tall that the lower storeys have to be very substantially built, and an amount of material, far in excess of what is necessary for the enclosing walls of our cottages, has to be used; because the dwellings are so high, many staircases with wide steps and of fireproof construction, and fireproof separating walls are needed, with the result that the tenement house of the newest type is so large and costly that comparatively few persons can afford to build houses. It may be added that the building regulations of German towns, which are the complement of town plans, prohibit the building of dwellings on any street until the street is ready for traffic.

Dear land has so much influence in aggravating the bad influence of other causes of the dearness of German houses that it is desirable that its own causes should be known. There is only one real cause for dearness of land in towns, viz., excessive use. It is because the acre of land provides habitations for a much larger number of persons in German towns than in English towns that land is so much dearer there than here. The average number of inhabitants per acre is in Berlin about 180, and in London about sixty-two.

The excessive use of land in German towns is the direct





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result of the adoption of a wrong principle in the preparation of the town plan. The German municipalities instead of providing that only those streets through which there will be much traffic, and those in which the buildings will be either the dwellings of well-to-do persons or public buildings, must be wide, have prepared plans which make great width necessary for nearly all residential streets.

Common widths in German towns for streets through which little traffic passes are 74 feet, 85 feet, and 112 feet, while in English towns many streets through which much traffic passes are not more than 36 or 39 feet wide. It is obvious that if a street, the cost of the land and construction of which has to be defrayed by the persons who build on each side of it, be wide and expensively sewered and paved, the houses built on it must be tall and deep, as no occupant of one small dwelling could afford to pay rent which included adequate interest on the cost of his house, its site, and half the width of the road. Tall, deep houses with back and side blocks have therefore had to be built on the wide German streets, and they enable such large sums to be received in rents from the use of their comparatively small sites that, whenever the by-laws allow such houses to be erected, if the town is one of increasing population, land becomes very dear as soon as the fact that tenement houses may be built on it is known.

The tall house containing many families is far less wholesome than the cottage. It is far less wholesome for its occupants because it is more difficult for the majority of them to reach the open air, and because many of its rooms are not nearly so accessible to light and air as are those of a cottage. It is far less wholesome for the rest of the inhabitants of the town because it interferes with the supply of light and air to other dwellings far more than do cottages.

(To be concluded.)

LONDON MASTER BUILDERS' ASSOCIATION.

THE Council of the above met on December 9 and 16, when the President (Mr. F. G. Rice) occupied the chair.

Matters of an important character were discussed and instructions given concerning them. The firms recommended by the organisation committee for election were adopted, and the Council felt that something should be done in connection with sub-contractors who wished to join the Association as associate members. With those who are purely builders' merchants there is no difficulty, but it was felt necessary to do something to enlist the cohesion of sub-contractors in case of labour troubles. A declaration to be given was adopted and a motion to amend the rules will be accordingly made at the next annual general meeting to meet these cases.

The quarterly financial statement was submitted and considered together with the investment account. Among other items cheques were drawn for the Association's subscription for 1909 to the National Federation, and contribution for the same period to the National Federation reserve fund.

It was decided to eliminate from the list of members those whose subscriptions were more than two years in arrear and from whom no satisfactory reply had been received to a recent communication.

The Council gave further consideration to the case of a builder who is contesting the decision of an arbitrator, and gave instructions accordingly.

The President (Mr. F. G. Rice) reported that he accepted an invitation to attend the conference on the apprenticeship question at the Mansion House on December 3, and reported the proceedings to the Council. It was regretted that no employer representing the building trade had an opportunity to speak at this meeting. A gentleman who, apparently, was not present, was announced to speak on behalf of the building trade, but he was in no way connected with the London Master Builders' Association, nor the National Federation of Building Trade Employers, nor even is he known as an employer. It would certainly be most desirable to enlist the sympathies and co-operation of the employers of the building trade if the movement is to be successful in the trade.

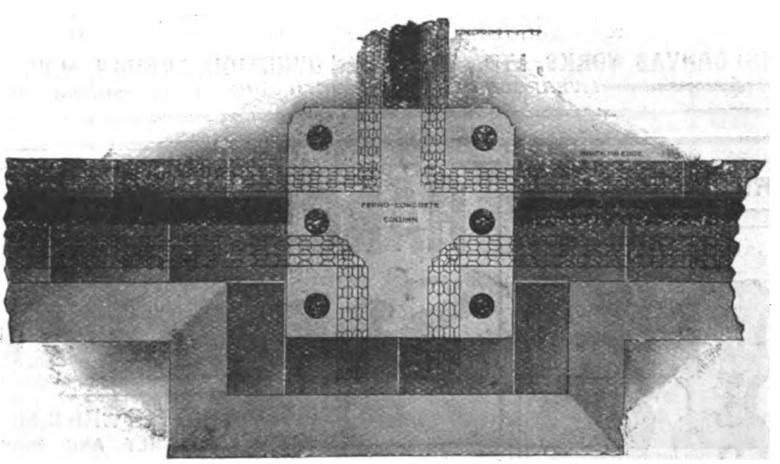
As a result of the conference with the Quantity Surveyors' Association the Council decided to send a copy of the following resolution, come to at the time, to every member of the Association:—"That this conference disapproves of the practice of asking for tenders in competition for works of a substantial value without quantities, prepared by a fully qualified surveyor, being supplied, and is of opinion that such quantities should be supplied in all cases when competitive estimates are invited for works expected to cost 500*l.* and upwards."

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A deputation consisting of the President (Mr. F. G. Rice), Mr. W. Shepherd, Mr. J. Randall, and Mr. G. Bird Godson, together with representatives of the National Federation were received by the President and officers of the Royal Institute of British Architects on Monday, December 13, and discussed the question of bills of quantities being supplied. After a very pleasant and courteous interview the deputation left with the assurance that the matter would be laid before the R.I.B.A. Council. Mr. F. G. Rice and Mr. Wm. Shepherd spoke for the L.M.B.A., and Mr. Ernest J. Brown for the National Federation.

A communication from the London Association of Master Decorators was received, and it was decided to appoint the President and officers of the Association to meet the master decorators.

Several questions of interest regarding trade practice were considered, such as demarcation of work, and the Leicester arbitrator's decision as to plumbers' work.

The arrangements for the annual dinner in February next were left to the President.

Mr. L. Horner and Mr. G. Bird.Godson were deputed to act with Mr. J. Carmichael in matters relating to the ventilation, &c., of the new offices in Kingsway.

The following committee was elected to consider alterations necessary in the rules of the Association:—The President (Mr. F. G. Rice), Mr. L. Horner, Mr. G. Bird Godson, Mr. J. S. Holliday, Mr. W. Shepherd, Mr. Frank May, J.P., Mr. F. Higgs, and Mr. F. L. Dove, L.C.C.

The following members were elected to represent the L.M.B.A. on the National Federation Council and administrative Committee:—

Council:—The President (Mr. F. G. Rice), Mr. J. Carmichael, J.P., Mr. S. B. Depree, Mr. F. L. Dove, L.C.C., Mr. G. Bird Godson, Mr. L. Horner, Mr. J. S. Holliday, Mr. J. F. Parker, Mr. F. M. May, and Mr. A. W. Turnbull.

Administrative Committee:—Mr. B. I. Greenwood and Mr. W. Shepherd.

It was decided to inform the members of the L.M.B.A. that the rules relating to measurement of slating and tiling issued recently by the Master Slaters' Association had not been considered or approved of by this Council.

The meetings terminated after lengthy duration.

PUBLIC HEALTH EXHIBIT AT THE JAPAN-BRITISH EXHIBITION.

An interesting meeting was held last week at the administrative offices of the Japan-British Exhibition, when the first gathering of the public health and sanitation committee took place under the presidency of Mr. H. D. Searles-Wood, F.R.I.B.A.

The committee itself is formed as follows:—Mr. H. Adams, M.I.C.E.; Mr. T. W. Aldwinckle, F.R.I.B.A.; Mr. H. P. Boulnois, M.I.C.E.; Professor H. R. Kenwood, M.B.; Colonel J. Lane Motter, R.A.M.C., M.A., M.D.; Dr. Samuel Rideal, F.I.C.; Mr. H. Saxon Snell, F.R.I.B.A.; Mr. W. C. Tyndale, M.I.C.E.; Mr. J. E. Wilcox, M.I.C.E.; Mr. J. E. Wroth, M.I.C.E., of the London County Council; and (*ex officio*) Sir John Cockburn.

The effect of the meeting is that special efforts are to be made to insure that the public health and sanitation section, concerning as it does the welfare and comfort of the community, shall be one of the most important at next year's great undertaking, and shall bear a favourable comparison to the great demonstration to be made by our Japanese allies, who, in peace and war, have proved themselves to be distinguished sanitarians.

A classification for the section was agreed to which embraces schools, prisons, barracks, camps, building material, dairy appliances, apparatus for water supply, heating apparatus, lighting and ventilation, clothing, domestic appliances, means for the development of the physique, and so on.

In order to carry out the enormous amount of work which this represents it was decided to appoint provincial sub-committees for Leeds, Birmingham, Newcastle, Glasgow, Edinburgh, Cardiff, Liverpool, Manchester, Bristol, Dublin, and all the great industrial and mercantile centres.

A feature of the section is to be its attractiveness from a spectacular as well as from an educational point of view, and the arrangements providing for this, which will be a revelation to the public, were discussed at some length.

Altogether the proceedings were of an eminently satisfactory character, and concluded with the granting of applications to exhibit on the part of some of the leading British firms.

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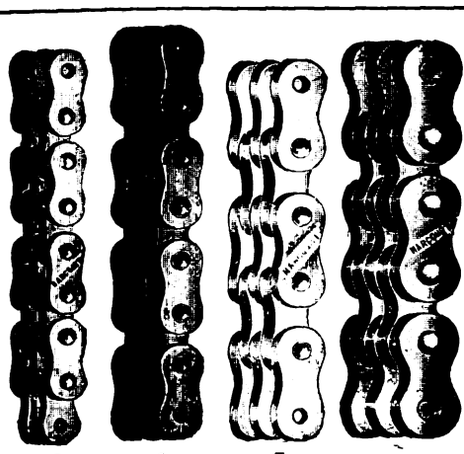
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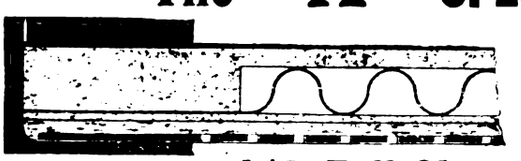
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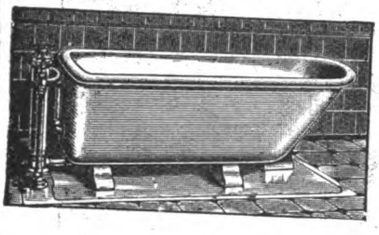
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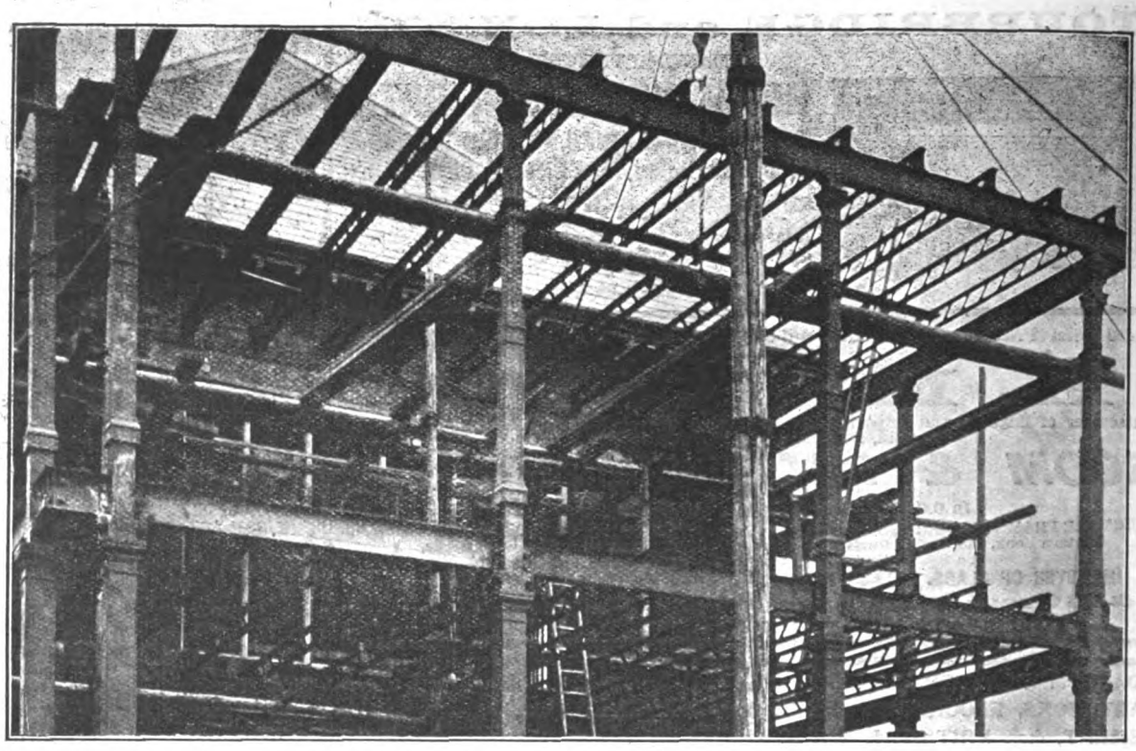
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British Patent—No. 1408, January 20, 1909.



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The Contract Reporter.

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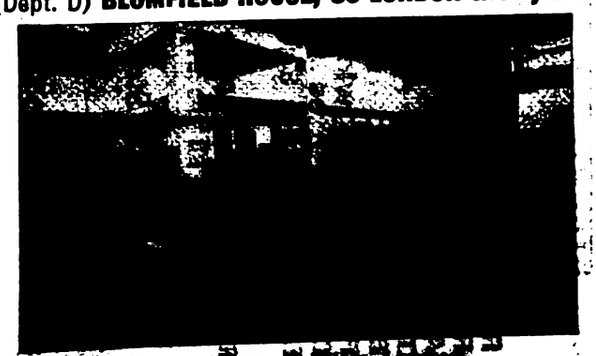
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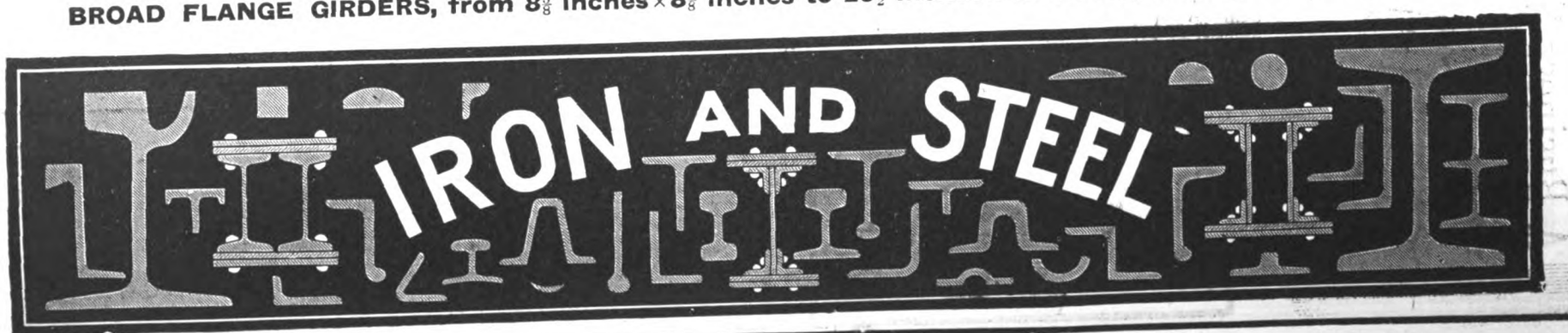
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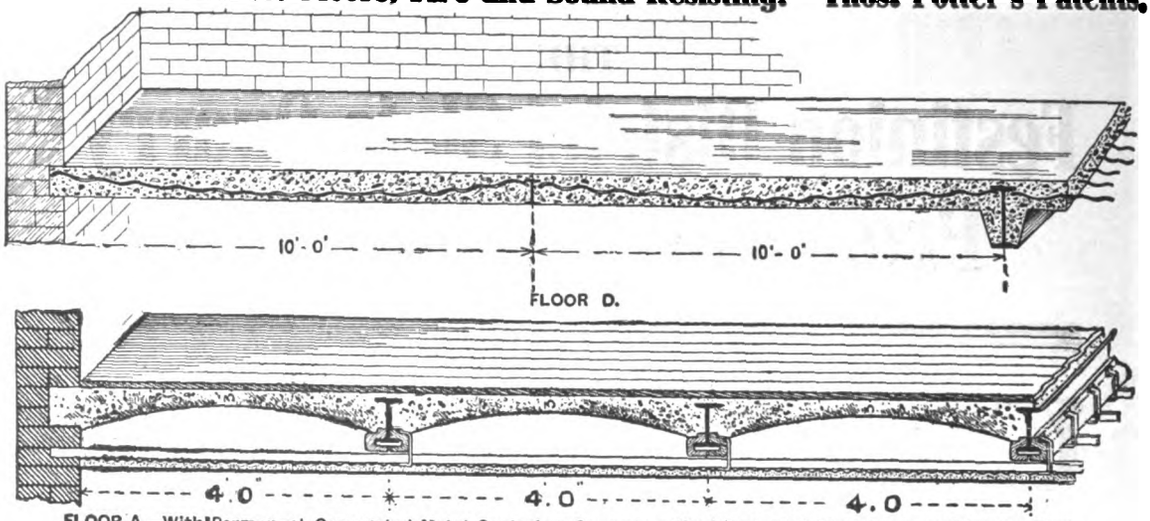
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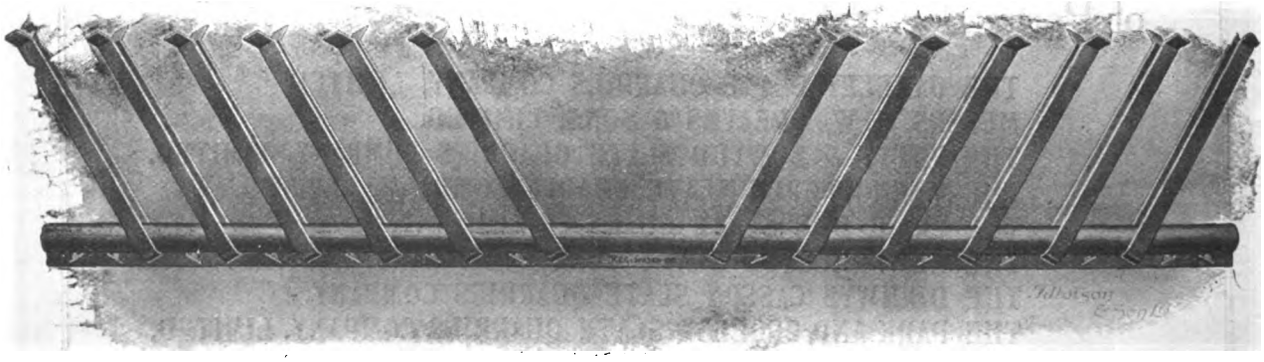
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Architect and Contract Reporter.

FRIDAY, DEC. 31, 1909.

Published weekly, subscription 19s. per annum for Great Britain, and for Colonial and Foreign subscriptions £1 6s. 6d. All business communications to the Managing Director,

P. A. GILBERT WOOD,

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Under no circumstances whatever can the Proprietors of this Journal guarantee alteration of copy if received after the first post on Tuesday mornings, and no proofs can be submitted if copy arrives later than first post on Saturday mornings.

EDITORIAL NOTICES.

In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

TENDERS, ETC.

**** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

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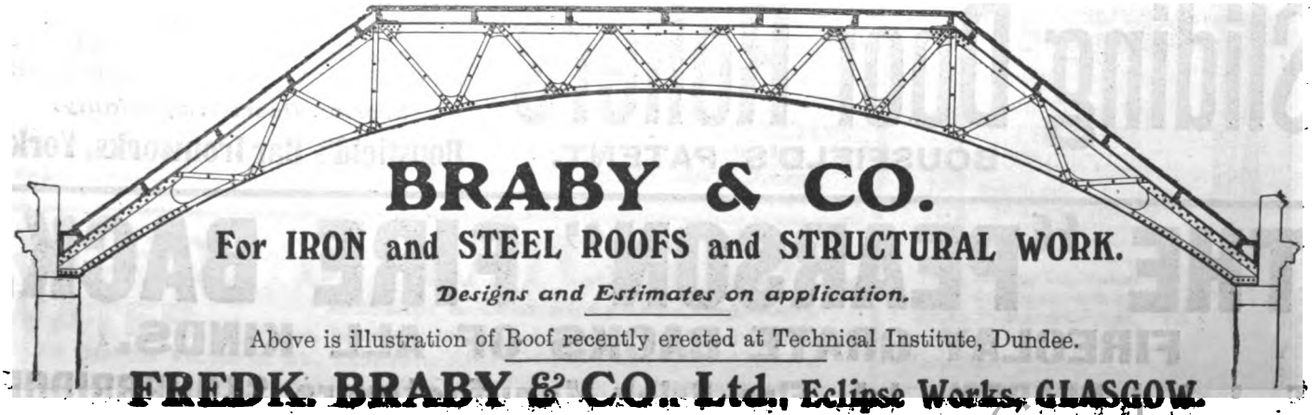
IRELAND.—Jan. 31.—The Pembroke Urban District Council, Co. Dublin, invite schemes and estimates for laying out Herbert Park (35 acres). Mr. J. C. Manly, Clerk, Town Hall, Pembroke, Co. Dublin.

LARNE.—Jan. 1.—For a technical school proposed to be erected in Victoria Street. A premium of 21*l.* will be paid for the approved design. Mr. Thomas Clearkin, Secretary, Technical Instruction Committee, Larne.

OLDHAM.—Feb. 1.—The Town Council invite competitive designs from architects practising or residing within the borough for an extension of the town hall. Premiums of 50*l.*, 30*l.*, and 20*l.* are offered, together with 5*l.* for every competitor who carries out the instructions. Apply to Mr. E. C. Foote, borough surveyor, Oldham, Lancs.

SOUTHAMPTON.—Jan. 27.—The Corporation invite plans from local architects for a pavilion on the Common. Premiums of 10*l.* and 5*l.* Mr. R. R. Linthorne, town clerk, Municipal Offices, Southampton.

WALES.—Jan. 31.—The Council invite designs for a National Library at Cardiff. Three premiums are offered. Assessors, Sir Aston Webb, R.A., Mr. John J. Burnet, A.R.S.A., and Mr. Edwin T. Hall, F.R.I.B.A. Deposit 2*l.* 2*s.* Apply to Dr. Wm. Evans Hoyle, Director of the Museums, City Hall, Cardiff.



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Blackpool.—Jan. 5.—For erection of offices in Sefton Street, for the health and cleansing committees. Deposit 1*l.* 1*s.* Mr. John S. Brodie, borough engineer, Town Hall, Blackpool.

Bridgwater.—Jan. 11.—For erection of United Methodist Church and schools. Mr. W. Hugill Dinsley, architect, Chorley, Lancs.

Brighton.—Jan. 13.—For the erection of an additional office for police purposes, on a portion of the forecourt at the north-east corner of the town hall. The Borough Surveyor, Town Hall, Brighton.

Bristol.—Jan. 6.—For extension of the casual wards at Eastville Workhouse. Deposit 1*l.* 1*s.* Mr. J. J. Simpson, clerk, St. Peter's Hospital, Bristol.

Brown Edge.—Jan. 14.—For erection and completion of a Council school for 100 infants at Brown Edge, in the parish of Norton-in-the-Moors, Staffordshire. Deposit 1*l.* 1*s.* Apply to Mr. Graham Balfour, director of education, County Education Offices, Stafford.

Calthwaite.—Jan. 5.—For the whole or any of the various trades required in erection and completion of new voluntary school, Hutton End, Calthwaite, Carlisle. Send names to Mr. H. Higginson, architect, 3 Lonsdale Street, Carlisle.

Chelmsford.—Jan. 17.—For erection of an elementary school at Trinity Road, Springfield. Deposit 2*l.* Messrs. Chas. & W. H. Pertwee, architects, Chelmsford.

Chigwell.—Jan. 7.—For the erection of a dining hall, workshop, &c., and for alterations to existing buildings, for the Governors of Chigwell School, Essex. Deposit 4*l.* 4*s.* Mr. H. Tooley, F.R.I.B.A., Council Offices, Buckhurst Hill.

Crewe.—Jan. 8.—For new training college for teachers to be erected at Crewe, for the County Education Committee. Deposit 2*l.* Mr. H. Beswick, F.R.I.B.A., county architect, Newgate Street, Chester.

Darlaston.—Jan. 3.—For the following trades—excavating, bricklaying and plumbing—in connection with the erection of the Premier Rink on the site in Blockall. Messrs. Sutton & Gregory, architects, Bromley House, Nottingham.

Devonport.—Jan. 12.—For the erection of 20A and 20B married soldiers' quarters, in flats and cottages, in three blocks, at Old Granby Barracks, Devonport, in the Southern Command. Deposit 10*s.* Apply by January 3 at the Office of the Director of Barrack Construction, 80 Pall Mall, London, S.W., or at the Barrack Construction Office, Old Granby Barracks, Devonport.

Enfield.—Jan. 17.—For construction of pumping station buildings, together with chimney, stores, coal bays, cottage, roadway, drainage, and other contingent works, at Hadley Road, for the Metropolitan Water Board. The Chief Engineer, Savoy Court, W.C. Deposit 10*l.* with the Accountant at Savoy Court, Strand, W.C.

Essington.—Jan. 14.—For erection and completion of a Council school for 130 infants at Essington, near Wolverhampton. Deposit 1*l.* 1*s.* Mr. Graham Balfour, director of education, County Education Offices, Stafford.

Great Chart.—Jan. 5.—For erection of a new cloak room at the Great Chart Council school, Kent. Mr. J. M. Poncia, correspondent, 17 Bank Street, Ashford, Kent.

Halesowen.—Jan. 3.—For the erection of tool house at the cemetery. Deposit 1*l.* 1*s.* Mr. A. E. Priest, P.A.S.I., Hagley Street, Halesowen.

Halifax.—Jan. 12.—For the enlargement of the Halifax Post Office. Deposit 1*l.* 1*s.* H.M. Office of Works, Storey's Gate, S.W.

Ireland.—For rebuilding manse, &c., for the committee of First Larne Presbyterian Church. Messrs. Watt, Tulloch & Fitzsimons, architects, 77A Victoria Street, Belfast.

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IRELAND.—Jan. 13.—For additions and alterations to the Hibernian Bank premises at Tubercurry, co. Sligo. Mr. Edward J. Toye, architect, Northern Gate, Londonderry.

JARROW-ON-TYNE.—Jan. 6.—For erection of public baths in Walter Street. Deposit 2*l.* 2*s.* Mr. J. H. Morton, F.R.I.B.A., architect, 50 King Street, South Shields, and 57 Westgate Road, Newcastle-on-Tyne.

LONDON.—Jan. 17.—For the re-appropriation of A.S.C. Block and erection of additions to provide accommodation for the Royal Army Medical Corps, Millbank, S.W. Deposit 10*l.* Apply by Jan. 7 the office of the Director of Barrack Construction, 80 Pall Mall, London, S.W.

MACCLESFIELD.—Jan. 18.—For the erection of a detached villa for private patients at Parkside Asylum. Deposit 2*l.* Mr. H. Beswick, county architect, Chester.

MALTON.—Jan. 12.—For erection of new post office at Malton. Deposit 1*l.* 1*s.* H.M. Office of Works, &c., Storey's Gate, S.W.

MARGATE.—Jan. 4.—For the extension of the glass and iron shelter at Westbrook. Borough Surveyor, 13 Grosvenor Place, Margate.

MARRICK.—Jan. 8.—For pulling down and re-erecting a dwelling house at Marrick, near Reeth, Swaledale, Yorks. Mr. Frank Martin, architect, 2 Prebend Row, Darlington.

NORTHWICH.—Jan. 15.—For erection of school to accommodate 350 children, at Northwich Darwin Street. Deposit 1*l.* 1*s.* Apply after December 28 at the Education Office, Verdin Technical school, Northwich.

OKEHAMPTON.—Jan. 17.—For new higher elementary school for 120 children, with laboratory, cooking, and manual training rooms, at Okehampton, Devon. Deposit 1*l.* 1*s.* The County Architect (education), 1 Richmond Road, Exeter.

OXFORD.—Jan. 3.—For erection of a boys' and girls' school in Thames Street, St. Aldate's, and for additions and alterations to certain existing buildings intended to form an infants' school in Luther Street. Deposit 2*l.* 2*s.* The City Estates Surveyor, Town Hall, Oxford.

RYHOPE.—Jan. 11.—The Durham County Council invite sole tenders for a secondary school at Ryhope. Mr. W. Rushworth, Shire Hall, Durham.

SCOTLAND.—Jan. 4.—For the following works, for the Dundee Town Council, viz.:—(1) Shelter at Victoria Park; (2) steelwork at Albert Institute; and (3) installation of electric light at St. Clement's Church. Mr. Jas. Thomson, city architect, 91 Commercial Street, Dundee.

SCOTLAND.—Jan. 8.—For the mason, carpenter, slater, plumber, plaster, painter and glazier works of public hall to be built at Knockando. Mr. Charles C. Doig, architect, Elgin.

SOUTH FARNBOROUGH.—Jan. 10.—For erection of a county school for 570 children at South Farnborough, Hants. Deposit 5*l.* 5*s.* Apply after December 28 to Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

SPENNYMOOR.—Jan. 18.—For the erection of a higher elementary school. Mr. W. Rushworth, Shire Hall, Durham.

STOCKPORT.—Jan. 7.—For the labour and materials required in the erection of brick walls and iron fencing at Carmichael Street (extension). Mr. John Atkinson, A.M.I.C.E., borough surveyor, Town Hall, Stockport.

STOCKPORT.—Jan. 10.—For the labour and materials required in erecting a wooden floor over a plunge bath at the St. Petersgate Baths. Mr. John Atkinson, A.M.I.C.E., borough surveyor, Town Hall, Stockport.

TROWBRIDGE.—Jan. 4.—For erection of a temporary platform, galleries, &c., in the Market Hall, Trowbridge, for the purposes of a public meeting on January 17. Mr. W. H. Stanley, A.M.I.C.E., architect, Market House Chambers, Trowbridge.

UXBRIDGE.—Jan. 3.—For the construction of an elevated plank footway, 100 yards long, at Ickenham, for the Uxbridge Rural District Council. Mr. John Wm. Harrison, engineer and surveyor to the Council, Corn Exchange, Uxbridge.

WALES.—For building a Council school at Aberllefenni, for the Merioneth education committee. Messrs. Deakin & Howard Jones, county architects, Plas Ynys, Borth.

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Wales.—Jan. 4.—For erection of fifteen cottages at Plasmarl Terrace, Swansea, for the Corporation. Mr. Marcus Hoskins, F.S.I., borough estate agent, Coleridge House, Swansea.

Wales.—Jan. 4.—For constructing two masonry buttresses in the river at Ynyshir, for the Rhondda Urban District Council. Deposit 1*l.* 1*s.* The Public Offices, Pentre, Rhondda.

Wales.—Jan. 5.—For erection of four houses at Newton, Porthcawl. Messrs. G. F. Lambert & Son, architects, Bridgend.

Wales.—Jan. 5.—For erection of a pair of cottage homes for children at Abercwmboi, Aberdare. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

Wales.—Jan. 5.—For building additions to the County school at Llandovery, Carmarthenshire. Mr. W. Vincent Morgan, A.R.I.B.A., county architect, County Offices, Carmarthen.

Wales.—Jan. 7.—For erection of an infants' school for 350 places at Cefn Coed, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor, County Hall, Brecon.

Wales.—Jan. 7.—For erection of a mixed school for forty places at Dyffryn Crawnon, near Llangynidr, Breconshire. Mr. Charles W. Best, M.I.C.E., surveyor to the Breconshire Education Committee, County Hall, Brecon.

Wales.—Jan. 10.—For alterations and additions to the farm house and farm buildings at Highfield, near Llantwit Major, Glamorgan. The County Police Station, Llantwit Major, and at the Glamorgan County Council Offices, Westgate Street, Cardiff.

Wales.—Jan. 11.—For alterations and additions to the goods shed at High Street, Swansea, for the Great Western Railway Company. The Engineer at Neath Station.

West Felton.—Jan. 7.—For erection of a cottage and farm buildings and alterations and additions to certain existing houses and buildings for small holdings at West Felton, Salop, about 2½ miles from Rednal station. Mr. Wm. T. Hall, agent, College Hill, Shrewsbury.

West Ham.—Jan. 17.—For the extension of the existing West Silvertown schools and the erection of the boys' new department. Deposit 5*l.* Apply by Jan. 1 to Mr. William Jacques, A.R.I.B.A., architect to the education committee, 2 Fen Court, Fenchurch Street, E.C.

Workington.—Jan. 14.—For the demolition of the Queen's Arms and adjoining cottages, King Street, and rebuilding of the inn on the site. Mr. Edwin J. Knight, secretary and manager, Messrs. Thomas Salt & Co., Ltd., brewers, High Street, Burton-on-Trent.

Yorkshire.—Jan. 10.—For the following works for the East Riding of Yorkshire education committee, viz.:—(*a*) Erection of a Council school to accommodate 133 children, and teacher's house, at Stamford Bridge; (*b*) alterations and additions to the Council school at Burton Pidsea. The Building Surveyor, County Hall, Beverley.

The Tottenham local authorities have decided to sell 2½ acres of land which were originally purchased for the erection of workmen's dwellings to a German firm of clothiers. The price agreed upon is 1,000*l.* per acre.

The American Consul at Erfurt has furnished a report to his government of a new compound called "Spokonin," for allaying dust and improving the surface of roads, which has lately been prepared and tested in Germany with favourable results, and which has been pronounced by some technical observers as the best and most lasting road-covering yet brought out. The merits of this process were discussed at the recent Convention of Scientists and Physicians held at Salzburg, Germany. The process is secret, but it is known that coal-tar oils are the main ingredients. The heavy, penetrating qualities of the oils give great binding power to the composition. This, together with the pressure applied, produced a formation iron-like in its consistency, making the surface of the road, it is claimed, so smooth and hard that snow and rain water cannot penetrate. Another important advantage ascribed to spokonin is the sanitary nature of the material. It is claimed that the creosote present in the tars, together with the high temperature of the composition when applied, combine to destroy all the bacteria in the dirt, thus preventing the spread of disease from particles that may be blown off the surface.

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TENDERS.

BOWES (YORKS.).

For the carrying out of a sewage scheme for Bowes, for the Startforth Rural District Council.

C. E. & J. W. Gibson	£302 11 6
Hetherington	215 5 6
Clarkson	189 0 0
Wilson	180 15 6
WALKER, Gilmonby (*accepted*)	168 10 0
Newbold	140 14 10

BRIDLINGTON.

For proposed alterations and additions to business premises at 5 Quay Road, Bridlington, for Mr. W. Neal. Mr. JOSEPH SHEPHERDSON, architect, 8 Quay Road, Bridlington.

MUSK & SON, Bridlington (*accepted*)	£295 0 0

For erection and completion of a dwelling house in Marine Drive, Bridlington. Mr. JOSEPH SHEPHERDSON, architect, Bridlington.

Turner & Son	£1,048 5 0
Kneeshaw	1,006 4 0
Leason	968 0 0
Postill & Son	945 0 0
Sampson & Siddall	937 12 0
WILSON, Bridlington (*accepted*)	888 2 2

CROSBY.

For erecting seven dwelling-houses. Mr. W. H. BUTTRICK, architect, Scunthorpe.

Buckley	£1,652 0 0
Buttrick	1,535 0 0
Robershaw	1,410 0 0
Quibell	1,399 10 0
Thompson	1,386 0 0
HOLLINGSWORTH, Scunthorpe (*accepted*)	1,384 0 0
Smith Bros.	1,365 0 0
Burnett	1,339 10 0

HALE.

For the making-up of a portion of Moss Lane, Hale, Cheshire. Mr. S. A. PICKERING, surveyor.

Exors. of T. Barber	£1,470 3 6
Worthington	1,409 13 10
Hamilton & Sons	1,397 8 0
Woodfine	1,211 5 0
WATSON, JUN., Altrincham (*accepted*)	1,180 0 0

LEIGH-ON-SEA.

For the following street works. Mr. JOHN W. LIVERSEDGE, A.M.I.C.E., surveyor.

Burnham Road sewering.

Price	£4,108 3 3
Way	4,062 15 1
Swaker	3,639 8 10
Jackson	3,330 14 3
Buxton	3,182 10 4
Parsons & Parsons	3,138 18 8
Galer	3,091 5 6
ILES, Southend (*accepted*)	2,937 0 0
Surveyor's estimate	3,094 16 6

Torquay Drive.

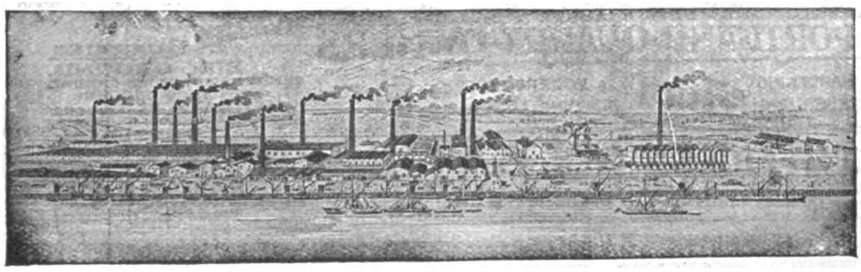
Price	1,513 19 9
Way	1,486 14 7
Jackson	1,302 10 1
Miskin	1,284 5 0
Parsons & Parsons	1,234 13 3
Swaker	1,218 14 11
Galer	1,216 15 0
Buxton	1,214 1 2
ILES (*accepted*)	1,133 0 0
Surveyor's estimate	1,179 0 6

Victoria Drive.

Way	1,293 7 0
Price	1,219 12 2
Jackson	1,072 7 11
Miskin	1,053 18 0
Parsons & Parsons	1,003 5 9
Buxton	993 7 11
Swaker	986 9 7
Galer	961 0 0
ILES (*accepted*)	924 0 0

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LONDON.

For extensions to the isolation hospital, for the Croydon Rural District Council. Mr. R. M. CHART, F.S.I., surveyor.

Claridge	£6,520 0 0
Sayers	6,000 0 0
Paskerfield & English	5,964 0 0
Nightingale	5,960 0 0
Pethick Bros.	5,888 0 0
Howe & White	5,678 0 0
Sands	5,670 0 0
Barker	5,670 0 0
Dawson	5,595 0 0
Southern Building Co.	5,573 0 0
Spencer, Santo & Co.	5,515 0 0
Stewart & Sons	5,479 0 0
Kirk & Randall	5,410 0 0
Wilkins & Son	5,378 0 0
Denne & Sons	5,375 0 0
Bacon	5,295 0 0
Parsons	5,293 0 0
J. Smith & Sons	5,200 0 0
Akers & Co.	5,197 0 0
W. Smith & Sons	5,194 0 0
Everitt	5,170 0 0
Deacon & Sons	5,149 0 0
Pattinson & Sons	5,143 0 0
Haslemere Builders	5,069 0 0
Appleby & Sons	5,030 0 0
Burges & Son	5,000 0 0
Moss	4,944 0 0
Saunders	4,940 0 0
Gathercole Bros.	4,900 0 0
King & Son	4,777 0 0
WALLER, Croydon (*accepted*)	4,776 0 0

For painting and cleaning the Mile End guardians' offices.

White	£850 0 0
Fay & Sons	419 19 0
Bull	368 0 0
Hubbard	305 0 0
Watts	300 0 0
Force	275 10 0

LONDON—*continued.*

Matthews	242 0 0
Perman	230 0 0
Gunning & Sons	225 0 0
Fenn	219 0 0
Dyke	218 0 0
Warman	205 0 0
Brown & Son	202 13 0
King & Barber	190 0 0
Root	187 0 0
Chappell	180 0 0
Holt & Sons	180 0 0
Young	179 0 0
Mosley	168 0 0
Spokes	164 10 6
Rathey	145 0 0
Inns	138 0 0
Woollaston	125 0 0
WRIGHT, Brixton Hill (*accepted*)	79 10 0

For the erection of an enclosure to coach-houses at the Eastern Ambulance Station, Homerton, N.E., for motor vehicles, for the Metropolitan Asylums Board. Mr. W. T. HATCH, M.I.C.E., engineer-in-chief.

Markham & Markham	£261 0 0
Stapleton & Sons	249 0 0
Miskin	245 0 0
Shurmur & Sons	243 0 0
Jewell	214 0 0
KING & SON, Peckham (*accepted*)	184 0 0

For repairs to roads at North Eastern Fever Hospital, St. Anne's Road, Tottenham, for the Metropolitan Asylums Board. Mr. W. T. HATCH, M.I.C.E., engineer-in-chief.

Wall	£495 0 0
Bloomfield	439 0 0
Adams	436 0 0
Bell & Sons	379 0 0
Griffiths & Co.	347 0 0
Miskin	345 10 0
Grounds & Newton	335 0 0
Catley	294 0 0
WHEELER & Co., Blackfriars Road, S.E. (*accepted*)	268 0 0

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LONDON—*continued.*

For cleaning and painting works and repairs at North Wharf Smallpox Shelters, Managers Street, Blackwall, E., for the Metropolitan Asylums Board. Mr. W. T. HATCH, engineer-in-chief.

Burns & Co.	£485	0	0
Squire	225	10	0
Vigor & Co.	214	0	0
Hussey	205	0	0
Kazak	197	0	0
King & Son	196	0	0
Nightingale	195	0	0
Woollaston & Co.	177	0	0
Fenn	166	15	0
Hocking	159	0	0
Dyke	145	0	0
Inns	144	0	0
Wright	140	0	0
HOLT & SON, Plumstead (*accepted*)	131	10	0

For the construction of additional lavatory accommodation for male staff at the Northern Convalescent Fever Hospital, Winchmore Hill, N., for the Metropolitan Asylums Board. Mr. W. T. HATCH, M.I.C.E., engineer-in-chief.

Markham & Markham	£357	0	0
Stapleton & Sons	324	0	0
Hussey	306	0	0
Miskin	280	0	0
King & Son	280	0	0
Fairhead & Son	275	0	0
Newby & Bros.	257	0	0
Jewell	250	0	0
Paul	234	0	0
Inns	222	0	0
Lown	222	0	0
Oram & Son	219	10	0
KAZAK, Belvedere (*accepted*)	216	0	0

LONDON—*continued.*

For providing and fixing boiler and low-pressure hot-water heating apparatus at the new higher elementary school, Greenleaf Road. Mr. H. PROSSER, M.S.A., architect.

Weston & Sons	£699	10	0
Keith & Blackman	638	14	9
Ditto (alternative tender)	582	0	0
Werner, Pfleiderer & Perkins	575	0	0
Grundy & Co.	537	0	0
Owens & Co.	524	0	0
Cassidy	497	0	0
Phillipps & Co.	479	0	0
Musgrave & Co.	452	15	0
Wontner Smith, Gray & Co.	450	0	0
Haden & Sons	375	10	0
Comyn Ching & Co.	374	0	0
DAVIES (*accepted*)	368	0	0
Ditto (alternative tender)	383	0	0

ROMFORD.

For erection of a new boiler house and Lancashire boiler, with Galloway tubes, at the workhouse. Mr. H. HARRINGTON, A.R.I.B.A., architect, 65 Bishopsgate Street Without, E.C.

Dowsing & Davis	£1,234	0	0
Willmott	1,220	0	0
Adjustable Cover and Boiler Block Co.	1,219	15	0
HAMMOND & SON, Romford (*accepted*)	1,194	0	0

SOUTHEND-ON-SEA.

For the making-up of the northern portion of Crowstone Road for the Corporation. Mr. E. J. ELFORD, M.I.M.E., borough surveyor.

Buxton	£2,695	0	0
Fry Bros.	2,611	0	0
Iles	2,599	0	0
PARSONS & PARSONS, Ilford (*accepted*)	2,583	0	0
Swaker	2,674	0	0

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For Index of Advertisers, see page x.

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SCOTLAND.

For (1) the construction of a road of access, (2) the diversion of outfall sewer, and (3) purification works, for the Johnstone Town Council. Mr. M. Ratcliffe Barnett, M.I.C.E., engineer, 124 St. Vincent Street, Glasgow.

Reid & Co.	£12,124 1 5
Martin	12,100 11 10
Blair	12,072 9 8
Flett	12,006 10 0
Brannigan Bros.	11,609 10 1
Brebner & Co.	11,174 11 11
Stark & Sons	11,079 3 6
White & Co.	11,020 12 11
Jackson	10,800 0 0
Kinniburgh	10,781 2 4
Craik	10,663 16 3
Mactaggart & Co.	10,632 5 1
Williamson	10,579 16 8
Duncan	10,424 16 0
Goldie & Son	10,413 10 0
Drysdale	10,357 5 5
Baikie & Sellar	10,349 16 5
Paterson & Son	10,151 6 10
Thomson & Sons	10,131 11 7
Wilson	9,941 19 2
Gibson	9,830 1 2
Calvin & Lind	9,730 11 7
Smith & Co.	9,729 1 0
Freebairn	9,709 12 3
Black Bros.	9,433 7 7
Keanie, Johnstone (*accepted*)	9,425 15 7
Topping	9,242 8 8

TAUNTON.

For alterations and additions to Taunton Castle, for the Somersetshire Archæological Society. Mr. J. Houghton Spencer, architect, Taunton.

Spiller & Son	£427 0 0
Potter	418 10 0
Spiller	399 0 0
Fox, Taunton (*accepted*)	385 0 0
Hot-water apparatus.	
Fisher & Sons, Taunton (*accepted*)	65 18 6

TIPTON (STAFFS.).

For the construction of main and subsidiary sewers, together with the necessary manholes, flushing manholes, lampholes, and flushing lampholes, &c. Mr. Wm. H. Jukes, M.E., engineer and surveyor.

Brebner & Co.	£3,658 2 6
Mitchell & Son	3,654 19 3
Acme Wood Flooring and Paving Co.	3,517 0 0
Wickstead & Co.	3,478 13 7
Graham & Sons	3,369 9 0
Currall, Lewis & Martin	3,089 0 0
Deakin	3,036 12 8
Braithwaite & Co.	2,990 3 7
G. P. Trentham	2,969 0 0
Firth	2,782 18 6
Johnson & Langley	2,749 15 0
Johnson Bros.	2,608 13 9
Kendrick	2,602 8 0
Edwards	2,589 17 2
Allsopp	2,578 10 0
Mason	2,559 17 0
Aird & Co.	2,522 10 3
Hill & Co.	2,486 0 0
Palmer	2,477 2 5
G. Trentham	2,472 3 6
Barry	2,400 0 0
Surveyor's estimate	2,393 13 6
Law	2,377 0 0
Owens	2,320 13 3
Powdrill, Luton (*recommended*)	2,292 3 8

For erection of a caretaker's house and outbuildings on land adjoining the public offices. Mr. W. H. Jukes, M.E., engineer and surveyor.

Jones	£296 0 0
Kendrick	245 0 0
Sisman	235 0 0
Smart	235 0 0
Crump	225 0 0
Edwards, Dudley (*recommended*)	219 10 0
Surveyor's estimate	224 10 7

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For the erection of St. Luke's Church, Wilkin Road. Mr. EGBERT CRONK, architect, Tunbridge Wells.

Crates & Son	£5,915 0 0
Smith & Sons	5,768 0 0
G. & F. Fenn	5,741 0 0
Davis & Leaney	5,700 0 0
Longly & Co.	5,689 0 0
Bowman & Sons	5,595 0 0
Goodwin Bros.	5,563 0 0
Lowe & Co.	5,548 0 0
Martin & Co.	5,495 0 0
Wallis & Sons	5,494 0 0
Ingleton	5,420 0 0
Jarvis	5,400 0 0
Peerless, Dennis & Co.	5,337 0 0
Strange & Sons	5,251 0 0

WALES.

For the erection of twenty-eight houses at Tynycae, Penygraig, Rhondda Valley, for Tynycae Building Club. Messrs. W. M. LEWIS & T. NAUNTON MORGAN, architects, Tonypandy and Pontypridd.

Shail	£237 10 0
J. Davies	230 0 0
R. Jones	217 10 0
Davies & Co.	216 0 0
Glass	210 0 0
T. W. Jones	200 0 0
Niblett & Davies	199 10 0
W. Jones	198 0 0
Davey & James	187 10 0
Hancock	183 15 0
Lewis	182 10 0
Morgan	182 10 0
HARRIS, Abercynon, Glam. (*accepted*)	180 17 6

WALES—*continued.*

For residence near Llandysoul. Mr. W. D. JENKINS, architect and surveyor, Llandilo.

Davies	£670 0 0
Thomas	623 0 0
JONES, Llangranog (*accepted*)	605 0 0

For erection of a pavilion, &c., at Porthcawl, for the Porthcawl Winter Garden and Skating Pavilion, Ltd. Messrs. GEO. F. LAMBERT & SON, architects, Bridgend.

Smith	£1.986 0 0
Radford & Greaves	1,925 0 0
RANKIN, Porthcawl (*accepted*)	1,834 12 4
Architect's estimate	1,748 16 0

WIMBLEDON.

For making up roads (Murray Road, Farquhar Road), for the Corporation. Mr. C. H. COOPER, engineer and surveyor.

Murray Road.

Free	£2,000 0 0
Price	1,841 18 1
Adams	1,732 0 0
Mowlem & Co.	1,712 0 0
E. & E. Iles	1,595 0 0
Wheeler & Co.	1,398 0 0
Wimbledon Corporation (*accepted*)	1,283 0 0

Farquhar Road.

Free & Sons	468 0 0
Mowlem & Co.	411 0 0
Price	385 11 8
Adams	385 0 0
Wheeler & Co.	383 0 0
Wimbledon Corporation	366 0 0
E. & E. ILES, Wimbledon (*accepted*)	334 0 0

THE London County Council have decided to proceed with the development of the Old Oak Estate, Hammersmith, by the erection of workmen's dwellings. The work will take ten years, and will cost 340,000*l.*, and details of it were given in our issue of the 17th inst.

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VARIETIES.

THE Worthing Theatre Royal was reopened on Monday, after extensive reconstruction at a cost of about 3,000*l.*, by Mr. Alfred Crouch, contractor, Worthing.

SHILDON Urban Council have sealed the agreement for the purchase of land for the new recreation ground—52 acres for 5,000*l.*—subject to the approval of the Local Government Board.

MR. FINCH, borough engineer of Bethnal Green, has been appointed the assistant engineer of the City under the scheme for the reorganisation of the City engineer's department.

THE Sheffield Corporation are framing new building by-laws. When they were first brought forward a number of objections were raised by the Chamber of Commerce and other parties. The City Council appointed a special committee, which has already interviewed some of the objectors. A meeting of a committee of the Chamber of Commerce was held last week to consider the present position of the proposals, and a deputation from it will wait upon the Corporation committee.

THE Coventry City Council have adopted a report received from the sewage farm committee recommending that 235 acres of land be purchased for the purpose of extending the sewage farm, and that application be made to the Local Government Board for sanction of a loan of 45,000*l.* The cost of the land is 17,000*l.*, and the remainder of the loan is made up of 24,900*l.* for works, 1,200*l.* for cost of bacteria plant, and 2,500*l.* for works of under drainage.

THE treasurer's committee of Edinburgh Town Council last week considered the advisability of the Town Council erecting at the Gorgie Markets shops or dwelling-houses for the purpose of encouraging the erection of other buildings there. It was agreed to modify the conditions and call the attention of builders to the change. In the event of no offer being forthcoming the committee would recommend the Town Council to consider whether operations should not be begun by the city.

MR. HERBERT L. G. RIGBY, late of Messrs. C. & J. Rigby, contractors of Holyhead Breakwater, the Somerset and Dorset Railway, and other important works, has left Manchester in order to represent in the South of England Messrs. W. Summerscales & Sons, Ltd., the makers of laundry and cooking machines. His address will be Chiswell House, 133 Finsbury Pavement, E.C., their London office, where his long engineering experience will be at the disposal of all requiring expert advice and for consultations.

MR. W. R. HOWELL, architect, Reading, has been instructed by the Reading Board of Guardians to prepare (1) the necessary drawings and specifications for the extension of the nurses' home and basement for storage purposes; and (2) alternative pencilled plans and estimates for the erection of a building on the workhouse premises to accommodate 120 and 150 respectively of the aged, infirm, and convalescent inmates of both sexes.

THE Royal Geographical Society have issued an appeal for funds for the enlargement or reconstruction of their premises in Savile Row, W. Some adjoining property has already been purchased at a cost of 13,500*l.* It is estimated that use could be made of the newly acquired property with an addition to the Society's capital of some 20,000*l.*, while the old and the new premises could be entirely reconstructed, so as to include an Explorers' Hall, for 50,000*l.*

AN unusually large number of plans for new buildings came up for consideration by the improvements and buildings committee of the Manchester Corporation on the 22nd inst. Some of them were for the provision of fine commercial premises, the erection of which is projected at an early date. The committee have also a considerable number of road widening and improvement schemes ready for putting into operation as soon as the state of the weather will allow.

THE Board of Trade have received an application from the Glasgow Master Plasterers' Association and the Glasgow Branch of the Scottish National Operative Plasterers' Federal Union for the appointment of a court of arbitration to decide questions which have arisen between the parties with regard to the rate of wages and the limitation of the number of apprentices. The Board of Trade have accordingly appointed a court consisting of his Honour Judge O'Connor (chairman), Mr. Jas. Platt (arbitrator from the employers' panel), and Mr. J. D. Prior (arbitrator from the labour panel).

THE special committee of the Glasgow Corporation which was appointed to make arrangements for the holding of an exhibition for the purpose of showing the public the

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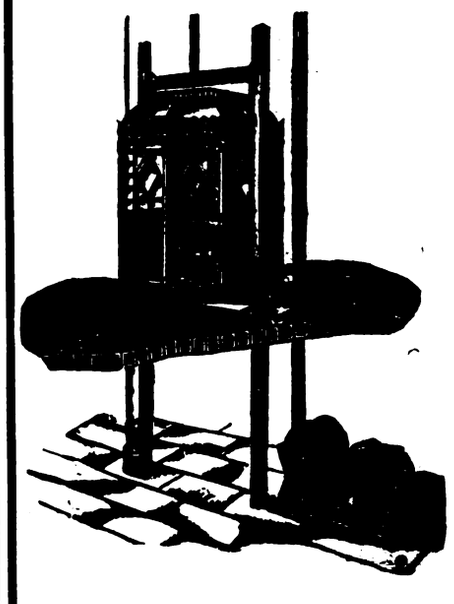
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most up-to-date appliances for lighting, heating, and cooking purposes, with a view to the diminution of the smoke nuisance, recommend that as it appears to be impossible to obtain premises at a reasonable rent for holding the exhibition in February, and that as an exhibition later in the spring would probably be ineffective, the exhibition be delayed until the autumn, and that meantime the remit to endeavour to arrange for suitable premises made to the sub-committee be continued.

THE Warrington Town Council have the report prepared by Mr. John J. Webster, M.Inst.C.E., upon the competitive designs received from contractors for the reconstruction of Warrington Bridge. He stated that twenty contractors had sent in tenders, but as many of them had tendered upon the same design, the actual number of designs submitted was ten. After careful consideration he left the designs of Messrs. Christiani & Nielsen and the Considère Construction Company for final consideration. Although the design of Messrs. Christiani & Nielsen was excellent and had been submitted in a masterly manner, the advantages were in favour of the design submitted by the Considère Company. He therefore recommended that this system be adopted. The committee, after discussion, decided to invite Mr. Webster's attendance at a further meeting.

THE Wandsworth Board of Guardians some time ago appointed Mr. E. R. Dolby, M.Inst.C.E., M.I.Mech.E. (Dolby & Williamson), of Westminster, as consulting engineer for the installation of the heating and hot-water service and boiler-house plant in their new Poor-law Infirmary. The engineering scheme was submitted to the Local Government Board and approved by them. Tenders were obtained from seven firms of contractors, and the lowest tender—that of Messrs. Moorwood, Sons & Co., Ltd., of Sheffield and London —was accepted. The contract has just been signed, and work has begun in the fine new buildings erected in St. James's Road, Wandsworth Common, S.W., to the designs of Mr. J. S. Gibson, F.R.I.B.A.

THE Doncaster Rural District Council have approved of two schemes of sewerage and sewage disposal for the rapidly increasing parishes of Adwick-le-Street, Owston, and Skellow. For the parish of Adwick-le-Street it is proposed to lay main and branch sewers and convey the sewage to a pumping station, where it will be automatically lifted by centrifugal pumps driven by electric motors to the Woodlands sewage-disposal works, which will be increased in size. For Owston and Skellow parishes there will be considerable lengths of main and branch sewers to be laid which will deliver the sewage similarly to a pumping station, where it will be dealt with in like manner and pumped to a site to be treated. It is proposed to construct screening and detritus chambers, liquefying tanks, and percolating and sand filters. Application has now to be made to the Local Government Board for sanction to carry out the works, which have been designed by Messrs. D. Balfour & Son, of Newcastle-on-Tyne and London.

THE York Master Builders' and Contractors' Association held their annual meeting at the Old George Hotel, Pavement, last week. The Lord Mayor of York (Alderman J. Birch) presided, Mr. W. E. Biscomb occupying the vice-chair. The minutes and correspondence having been read, the Secretary read the report of the year's work, which was considered very satisfactory. The balance-sheet and financial statement showed a substantial balance in hand. The Lord Mayor was unanimously re-elected president of the association for 1910, and was complimented on his re-election to the office of Lord Mayor of York, and his recent election to the Freedom of the Worshipful Company of Plumbers, an honour not previously granted before to anyone outside of London. The freedom carries with it also a parliamentary vote for the City of London. Mr. W. E. Biscomb was unanimously re-elected vice-president, and Mr. C. Dent treasurer. In view of the local importance of the association and the growing scope for its work it was unanimously resolved to increase the executive committee from thirteen to eighteen members, and the following gentlemen were elected:—Councillors F. W. Birch, J. Hardgrave, G. Mansfield, J.P., and G. Sharp, and Messrs. W. Bellerby, J. W. Bellerby, W. Birch, J. W. Biscomb, T. Belt, H. Colman, R. Dent, J. Fairweather, H. Harrison, T. Rawling, G. Rawling, G. Turner, W. Usher and L. Wray. The secretary (Mr. J. Hague, solicitor, 29 High Ousegate) was unanimously re-elected. The Federation representatives for the year were re-elected, and consist of the president, vice-president and treasurer. It was decided to send four delegates to the National Federation meeting in London in January next.

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TRADE NOTES.

The new National schools, Newport, I.W., erected from the plans of Mr. Percy G. Stone, F.R.I.B.A., F.S.A., architect, Newport, I.W., have been ventilated by means of Mackay's patent direct-acting ventilators of an ornamental design, and Mackay's improved fresh-air inlet panels, supplied by Messrs. Cousland & Mackay, ventilating engineers, Glasgow, the sole makers.

It is regrettable to learn that the handsome pavilion on the Britannia Pier at Great Yarmouth has been totally destroyed by fire. The building is, of course, not the well-known Uralite pavilion on the adjoining Wellington Pier. In the construction of the latter special precautions were taken to safeguard against any outbreak of fire.

A NORWICH INDUSTRY.

The constructional engineering department of Messrs. Boulton & Paul is the outcome of that steady expansion and ordered development of business which marks the successful firms of the country. This branch came into existence through the growth of the wood-framed buildings department, and served at first merely as an appendage to it. In a short while, however, its importance had so far increased as to necessitate its transformation into a distinct department with a specially trained staff and elaborate plant. A fine site has been allotted to it adjacent to the Great Eastern Railway, and here are always stored a large stock of steel bars, joists, angles, galvanised sheets, bolts, &c. The firm are consequently in a position to construct steel-framed buildings or extensions upon a very short notice. For such work Messrs. Boulton & Paul have the very great advantage of possessing a permanent buildings branch and wood works, whose resources can be concentrated on any contract undertaken, and by which they can supply all the labour and material required from foundations to roof, as well themselves carry out sub-contracts like lighting and heating. It can be hardly necessary to say that the firm are ready to put the services of their own specialists at the disposal of architects who have work of this character to design, but who may not have made a particular study of this class of construction.

The constructional engineering department have a goodly number of jobs to their credit—some of a simple nature, such as a steel-framed timber drying shed or a glazed garage roof, and others of a more complicated character. Among them may be mentioned various store buildings at Messrs. Coleman & Co., Norwich; the Military Riding School, Cambridge; an engineering workshop for Messrs. Laurence, Scott & Co., Ltd., Norwich; a timber drying shed at Portsmouth Dockyard; motor garages at Kingston-on-Thames, Altrincham, Leicester and Norwich; railway footbridges at Leytonstone and Krugersdorp, South Africa; emergency staircases and verandahs at Huddersfield Infirmary, and other works.

HENRY SAXON SNELL PRIZE.

The subject given in 1909 for the essay in competition for this prize was "The principles of heating and ventilating public buildings, with descriptive details and illustrations of the best systems." Fifteen essays were sent in, and they have been brought under the consideration of the Council of the Royal Sanitary Institute.

Acting upon the advice of the adjudicators appointed, the Council have awarded the prize offered of 50*l.* and a bronze medal of the institute, to Mr. Alfred E. Wheeler, West Ealing, writing under the motto "Helios."

Two of the other essays showed exceptional merit, and the Council have therefore decided to increase the amount of the award by 20*l.*, and to divide this amount equally between the writers of these two essays—to Mr. J. Roger Preston, M.R.San.I., Stourbridge, writing under the motto "Glow-worm," 10*l.*; and to Mr. E. Thomas Swinson, M.R.San.I., Feltham, writing under the motto "Dum Spiro Spero," 10*l.*

AUSTRALIA'S ASSOUAN.

By John Plummer, of Sydney.

Within the next few years Australia will be in possession of a dam eclipsing in volume and extent that at Assouan, which bids fair to assist in reviving the industrial marvels of ancient Egypt. The Assouan dam is at present the largest in the world. It impounds 37,000,000,000 gallons of water, as against the 33,000,000,000 which will be the

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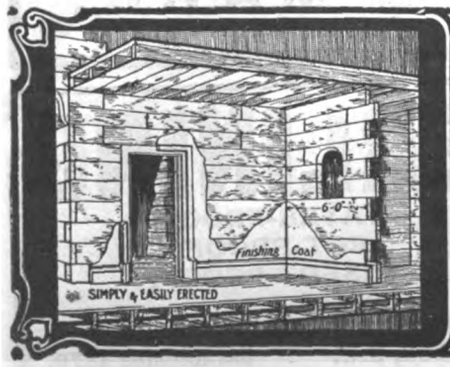
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carrying capacity of Barren Jack, as the Australian dam is unworthily named; but while that at Assouan is shallow and stretches over sandy country in a hot climate, the Barren Jack waters will be contained between two ranges of mountains attaining an altitude of 2,000 feet, and situate in a comparatively cold climate. Allowing for the loss in the Assouan dam by evaporation and absorption, leading engineers hold that the storage value of the New South Wales work will be the greatest in existence. The waters of the Murrumbidgee, which, with its tributaries, will feed the dam, will be backed up about forty miles, the dam, when full, holding one and a half times the quantity of water contained in Sydney Harbour, the length of the immense walls thrown across the river being 900 feet by a height of 240 feet. The estimated cost is 850,000*l.*, against 2,450,000*l.* the expenditure at Assouan. The Murrumbidgee is one of the largest rivers in the Commonwealth, and the country lying between it and the Murray is known as Riverina. The soil is one of the richest in Australia, but the absence of the means of irrigation has necessitated its being used chiefly for pastoral purposes. The construction of the dam will cause all the low-lying lands beyond the gorge to become placed under water, and creating an inland sea of some twenty square miles. Before the dam could be constructed the waters of the Murrumbidgee had to be diverted by means of an artificial river channel. This was a formidable undertaking, but it was successfully accomplished. The place chosen for the construction of the dam is described as being an ideal one. "Solid red granite," says a recent visitor, "is the river bed, and red granite are the mountain sides. No better natural foundation for the work could be desired, and the narrowness of the river at this point adds to the facilities nature has provided. The rock that crops out on the slopes is the adamantine granite for which this mountain is famous, and the task of making the road to the scene of operations has been a hard one. Tons and tons of granite have had to be blasted away from the face of the hill, and the river bed is piled with huge boulders that have crashed down from above. It is the extent of the preliminary workings that gives one an idea of the vastness of what has to be accomplished. There are several fine examples of engineering and constructive skill that exist solely for the carrying on of the bigger work. When the dam is complete they will be done with and demolished. On the concrete platform stands a large wooden tower, 50 feet high. At the base of the tower stands a powerful engine, and from the summit the steel cable, 7 inches in circumference, stretches across the chasm to another tower on the opposite side. The second tower is but 33 feet high, but that end of the cable is over 50 feet above the other, the rocky platform on which the tower stands being 120 yards above the river. Twelve hundred feet is the span across the gorge, and the cable's centre sags deeply under its own immense weight. From it depends an iron cage and pulley, by means of which the heavy blocks of stone that are to go to build the dam will be handled and placed in position. The hundred yards down from the road to the river does not seem a great distance, but to the pedestrian the journey is a tedious one, for the precipitous nature of the slope necessitates a devious pathway. The rubbly earth that binds the granite to the mountain side offers none too sure a foothold, and steps have been constructed from top to bottom. These are simple but ingenious. A few thousand cement sacks filled with earth and placed in position—and you have steps with an excellent non-slipping surface ready for use. The workings on the slope are of an elaborate nature. A miniature telephone line connects the workers below with those up above, and chutes and cable ways facilitate the carrying of tools and building material. Dotted about are smiths' shop and engine sheds, and preparations are almost finished for the installation of a complete electric plant that will be needed as the work advances. Earth and stone from the hillside are wanted for the strengthening of the preliminary dam that has been erected to protect the foundations of the other, and men are busy getting material. The earth passes through several hands before it reaches the workmen on the dam. Men dig it out high up on the steep. Others cart it in wheelbarrows down a sloping plank-way, and send it hurtling down a 30-foot chute, where it is again collected and loaded on skips that glide down a cable to the dam top." The total cost of the undertaking will be over 1,500,000*l.*, but the whole of the expenditure will become recouped by the rentals of irrigation supplied and the improved values of the unalienated lands.

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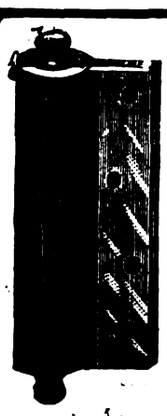
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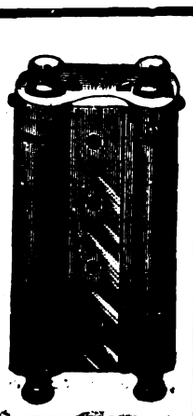
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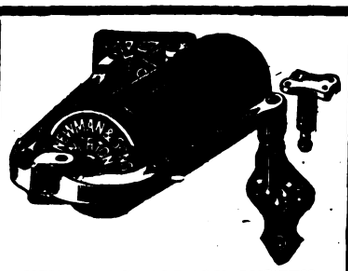
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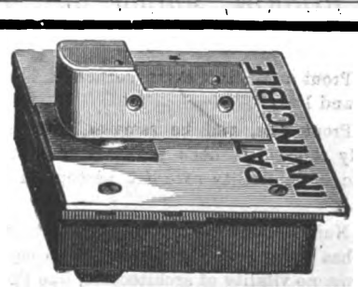


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IRISH SLATES.

We have often felt that the resources of Ireland in its capability for supplying excellent building material have not been sufficiently exploited, but the merits of Killaloe slate are so well recognised that we were surprised to learn that in connection with the Blackrock Urban Council's scheme for the better housing of the working classes, in which some trouble arose through the contractor being unable to procure the requisite quantity of Killaloe slates, specified for in the contract, and in consequence of which a special meeting of the Urban Council was held to consider the matter, the correspondence between the contractor and the engineer and the Killaloe Slate Company, was before the meeting. It was pointed out that as the Killaloe Slate Company could not execute the order for 15,000 slates of a specified size within a week, the architect ordered the contractor to use Welsh slates. The Urban Council in the circumstances were satisfied that no other course was open to the contractor than to use the imported slates, though they said they sanctioned the course with extreme regret.

FITZALAN SQUARE, SHEFFIELD.

The necessity for an intelligent and artistic control of the laying-out of our cities is well emphasised by the present condition of Sheffield, as to which Mr. Charles Hadfield, one of the city's most respected architects, in a letter to the *Sheffield Daily Telegraph*, says:—

Your issue of the 9th inst. records "the transformation into an ornamental central square" of "Fitzalan Square, most misshapen and undignified of open spaces," as the writer described it in an article on our street architecture which appeared in "Sheffield in 1902," wherein he noted "that Sheffield, with its many natural advantages, is a place of lost opportunities, and must surely look to other things than its stones and streets to enforce its claims upon the admiration of posterity."

Since that date certain improvements have been effected in our public thoroughfares, but this last transformation, now a fair subject for open criticism, bearing as it does on the burning question of the hour, "æsthetic town planning," demands more than a passing notice from the architect, who realises how much hangs on scientific planning and the right laying out of building surroundings.

The writer ventured to remark in 1902 that "since our city's great schemes of central street improvement were inaugurated, there have been few, if any, important buildings erected which have not suffered in some degree from the distortion of their sites and approaches, and the fact that the new thoroughfares have been planned, apparently without a proper perception of the laws of composition and perspective," and with a resulting absence of properly contrived terminations and vistas. Typical instances, too, were cited, the new Town Hall site to wit, and, in the writer's own connection, the gas offices and Corn Exchange Buildings sites, all of which had suffered from commonplace street laying out.

The Fitzalan Square improvement was faulty in its initial planning under the Provisional Order of 1868; and no remedy, short of destruction, will suffice to undo the mistake made at that time.

Anyone passing down High Street to the Haymarket must be struck with the depressed appearance of the new Post Office Buildings, which look as if their base had bodily subsided into the earth, while the newly laid-out oval stone-balustraded terrace walls in the foreground have only served to accentuate the defect of the planning of the square and its approaches.

The Sheffield architects, I observe, are said to be responsible "for the design of the ornamental enclosure and its details, in consultation with the city engineer and his staff."

As one of the former, I venture, now that all is open to public view, respectfully to submit my criticisms of the undertaking, and to disclaim any responsibility for the result; and, knowing somewhat of mason's craft, I must own that I do not regret the city Council's action in rejecting the use of granite for the execution of so essentially commonplace a design.

The Brodick United Free Church congregation, N.B., are now to proceed with the erection of a new church and manse. Suitable sites have been granted.

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Mr. RUSKIN, Author of "The Seven Lamps of Architecture," &c., &c., referring to these Drawings, says:—

"Prout ransacked every corner of France, Germany, the Netherlands and Italy."

"Prout was, and he remains, the only one of our artists who entirely showed Turner's sense of magnitude; and of all forms of artistic susceptibility reverent perception of true magnitude is the rarest."

"Numerous as have been his imitators, extended as his influence, there has yet appeared nothing at all to equal him; there is no stone drawing, no vitality of architecture, like Prout's."

"His 'On the Grand Canal, Venice,' is an Arabian enchantment, his 'Street in Nuremberg' is a German fairy tale."

"Prout drew every lovely street in Europe."

"I have," says Mr. Ruskin, "both in my earlier books and in my ectures at Oxford, spoken of the sketches of Prout with reverence and enthusiasm."

"The sharpest photograph is not half so natural."

"No architect, however accurate in his measurements—no artist, however sensitive in his admiration—ever gave the proportion and grace of Gothic spires and towers with the loving fidelity that Prout did. This is much to say; and therefore I say it again deliberately, there are no existing true records of the real effect of Gothic towers and spires—except only Prout's."

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GERMAN ERRORS IN TOWN PLANNING.*

(Concluded from last week.)

WHILE it is admitted by all that the building of tall houses raises the rent and price of land, it is often asserted that this does not necessarily raise the rents of each separate dwelling, since the cost of the site of a dwelling forms but a small portion of the total cost of the dwelling, and by adding one storey or several storeys to the height the cost of the site is distributed over so many dwellings that the extra cost of the land is more than neutralised. This statement is fallacious. The addition of storeys beyond the number customary in any given locality raises the cost of all land round the sites of the tall houses, and thus adds greatly to the cost of roads, parks, playgrounds, and public gardens, and the sites of schools and other public buildings, and thus increases the amount of the rate and consequently the rent.

Even if the greater part of the increment of value of land due to excessive use, either by the building of tall houses or of a large number per acre of cottages, were recovered by a rate on the increment, the rate could not nearly compensate the community for the heavy outlay imposed through the raised price of the land, and the community receives no compensation at all for the injury to its health due to the same cause.

There are other causes of the dearness of German houses (causes which are not operative in this country), such as the influence of the Grundbuch system for officially recording the ownership and the degree of indebtedness of every plot of ground, and the predominant influence in German town councils of owners of houses and land.

Another factor is the difference between English and German rents of dwellings. Figures already given show that as a rule the German house contains far more persons than does the English house, but they do not give a true idea of the difference of size between the majority of the houses now being built in the two countries. A large proportion of the new houses built in German towns are larger than used to be built there, while the average house in England does not, except in London, hold more persons than did the average English house of twenty years ago. Probably the new house in large German towns to-day contains on an average at least a dozen households, whilst the average English house, if London be left out of account, contains only 1.08 households, or 5.2 persons.

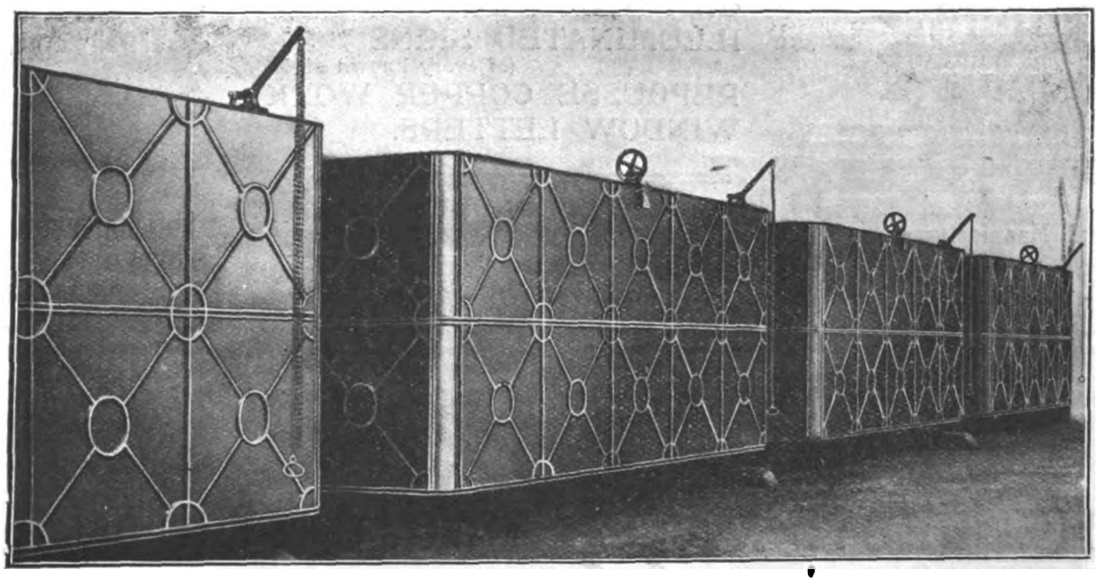
The cost of a cottage for one English working-class family ranges from 150*l.* to 250*l.*, and the average may be taken as 200*l.* The cost in Germany of the tenement for each working-class family is not less than 200*l.*, so that the average cost of the house containing twelve tenements may be taken at 2,400*l.* Obviously, even if the population of England contained only the same proportion of persons with a given amount of capital as did that of Germany, there would be a vastly larger number of persons in it able at any given moment to expend 200*l.* on the building of a house if the need for new dwellings existed, than there would be in the German population of persons with 2,400*l.* to spare for the building of a house. Hence, other things being equal, the need for a large number of dwellings must be more rapidly supplied in this country than in Germany, and rents are not likely to be raised in the same degree here as in Germany by a short supply of new dwellings, and the price of land is not likely to be raised here as it is being raised there, by the rising rents of dwellings.

But other things are not equal in the two countries. When in Prussia a town plan is prepared and adopted, as already mentioned, no houses may be built on the new streets until they are nearly completed; and thus the rate at which the need for new houses can be supplied is still more retarded, and the rents of the houses are raised, and consequently the price of land raised also by the absence of competition in a way unknown here. In this country any number of new streets can be got ready to receive new lines of cottages in a very short time.

Cause No. 4, both of the dearness of German houses and for the slowness of the rate at which they can be built, is that in Germany far greater precautions are needed to guard against the danger of fire and of collapse in the case of tall buildings than are needed for cottages. That the German civic authorities have taken even more care than we believe to be necessary to guard against these dangers can be seen

* Abstract of a paper prepared by Mr. T. C. Horsfall in connection with the National Town Planning Congress held at the Westminster Palace Hotel, S.W., on December 14 and 15.

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from the fact that they require two thick walls for all but the highest storeys of tenement houses, fire-walls to separate each house from its neighbours, and an ample supply of wide fireproof staircases for every house.

Many English people finding that the poorer inhabitants of German towns are much better clad and much cleaner than the corresponding classes in our towns, and seeing too that the German tenements are cleaner and neater than English town cottages, may easily attribute all this superiority to the influence of the German method of housing, and, therefore, indirectly to the German method of using town plans. They may at least suppose that the evils of that method are far less serious than they have been said to be. But this would be a great mistake.

In spite of the much better training of the Germans many of the tall houses show a lack of cleanliness, the death rate in their towns is much higher than in ours, and the rate of infant mortality is very much higher there than here. It is quite certain that if the population and the municipal governments of a large English town and a large German town were interchanged—say those of Hamburg and Manchester—that English people placed in the tall German houses would live miserably and die rapidly, while the new German rulers of Manchester by clearing small open spaces for playgrounds, and training children to use them, by creating numerous town gardens and planting with trees all streets and squares where it was possible to find space for them would soon make the poorer districts of Manchester much healthier and much less hideous than they are at present.

Professor E. Hoegg, speaking of Bremen, says:—"However badly a street may have been planned it will always have a much pleasanter effect if in it we see across front gardens full of red flowers, and under shady trees, comfortable two-storey houses, perhaps with red tiled roofs and covered with creepers, than is given by smart, over-decorated tenements of the Berlin pattern, six storeys in height, in a dusty street, much too wide for the houses which line it."

We can learn from Germany most important lessons with regard to residential streets, at any rate with regard to residential streets in those parts of towns where the houses are needed chiefly for families with small incomes; but the lessons to be learnt are mostly as to what kind of action should be avoided. But we can also learn from Germany the positive lesson that the town plan should prescribe that residential streets must run in the direction which makes it most easy to provide the chief rooms of every dwelling with abundant sunshine. From Port Sunlight, Earswick, Hampstead, and the co-operative colonies we should learn the lessons that the town plan and by-laws must keep land cheap by the restriction of the number of houses per acre of land, and by keeping down paved roads to the width which is really necessary.

Two of the uses made of town plans in Germany are wholly good, and should certainly be adopted here. In German town plans every street through which it is believed that much traffic will pass is laid of sufficient width for the expected amount of traffic, so that the inhabitants of German towns are spared that most useless kind of expenditure on which in this country millions of pounds have been wasted, the purchase at very high prices of the property on one side of a street only a few years old for the purpose of giving to the street the width which every man of experience knew from the beginning would soon be necessary.

In the case of streets which it is believed will have much traffic through them eventually, but which are not likely to be very much used for some years, the street is laid down with sufficient width between its two lines of buildings for the needs of the largest amount of traffic expected, but only the width of road immediately needed is paved, and the builders of houses have to provide front gardens and surrender them for incorporation in the street when the first paved portion of the street is found insufficient for the developing traffic.

It is probably impossible to tell yet whether the power given by the "Lex Adickes" to the municipal authority of Frankfort-on-Main, viz., the power to pool the land of the various owners in a new district and redistribute it among them, deducting from it the land needed for streets and other public purposes, will be needed here. No direct use has been made of the law in Frankfurt, and yet the law has been very useful as it has made land owners very amenable to the suggestion of the authorities and has greatly facilitated the task of inducing them to make reasonable agreements with each other. Essen, Baden and Hamburg, and the Swiss towns Zürich and Basel, have all given their town councils the power which is given to the town council of Frankfurt by the "Lex Adickes," and the last official Prussian Housing Bill contained a clause allowing all towns to obtain the power.

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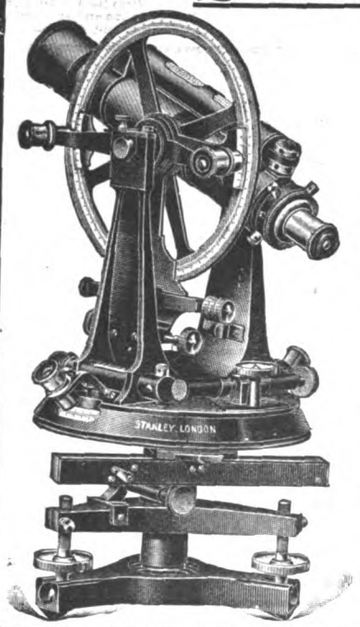
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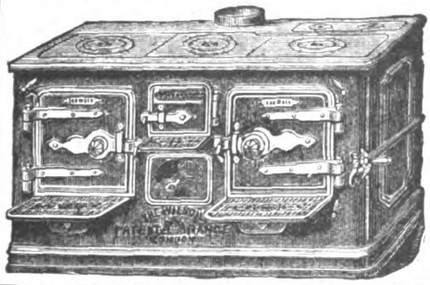
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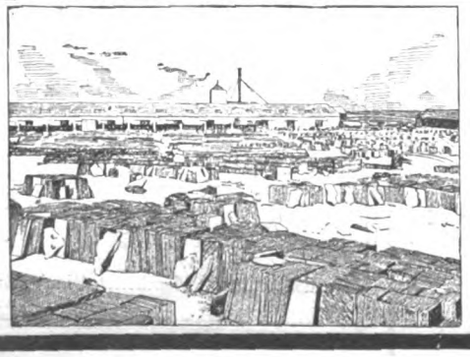
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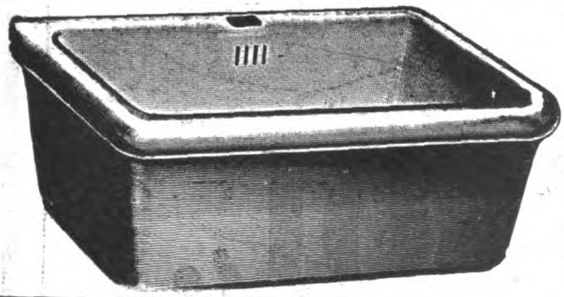
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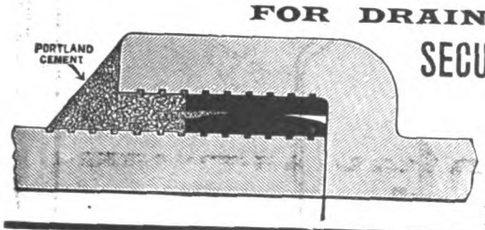
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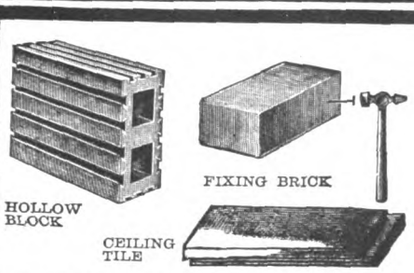
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